z/OS Basics Freeware - PDS The Swiss Army Knife of Utilities - Hands-On Lab

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ABSTRACT

PDS is one of the most popular freeware tools for the mainframe. Originally developed to manipulate PDS data sets, PDS has matured into a toolkit to handle many types of data sets. This self-directed hands-on lab will show the user how to use PDS to make many everyday tasks simpler and easier. Some of the tasks included in the lab will be replacing one string with another throughout a PDS, selecting members for more specific operations, recovering deleted members, and fixing directory block or space shortages without re-allocating the data set. Familiarity with TSO and ISPF are the only real prerequisites for this lab, so beginners and experts alike are welcome to attend.

Legal

- Swiss Army™ is the registered trademark of Victorinox AG and subsidiaries, and is used here with their kind permission.

AGENDA

- Overview of what PDS is
- Download the PDF from the SHARE proceedings
- Logon to TSO; exit ISPF; Prime TSO allocations
- Launch ISPF; Launch PDS
- Use PDS to complete LAB exercises

Overview of what PDS is

PDS is a TSO command for Partitioned Data Sets and Partitioned Data Sets Extended (PDSE's). You can control PDS with subcommands which manipulate the entire partitioned data set or process individual partitioned data set members.

PDS can run in line mode in TSO foreground (online) and background (batch). PDS can run as an ISPF Dialog Manager application using panels, messages, and tables. This is the preferred method of operation because of the power of ISPF along with the tutorial and prompting panels.

Sam Golob wrote in one of his articles about pds, "*STARTING to use PDS has proven to be the greatest barrier. PDS has many subcommands, each of which in turn, has a variety of options. (Help!!) The new user, unaware of the things he potentially can do, and swamped by the number of things to choose, doesn't know where to start.*"

PDS can be invoked as a line command from the ISPF 3.4 DSLIST display. In order for this to work, the PDS panel, message, and load libraries must already be allocated to the ISPPLIB, ISPMLIB, and ISPLLIB concatenations.

When running PDS in ISPF Dialog Manager mode (ISPMODE), there are 7 different ISPF table displays which can be active. The following display was produced by the FUNCTION dialog command.

```
Choose one of the following options:
  Option     Function     -- Description --     ---- Status -----
    8      - View Log     View session log       ACTIVE
    ML     - MEMLIST      Member list            ACTIVE
    LA     - LISTA        Allocation list        INACTIVE
    LF     - LISTF        File list              INACTIVE
    LV     - LISTV        Volume list            INACTIVE
    CAX    - CAX          Active catalog list    INACTIVE
    TCT    - TCT          TSO command table      INACTIVE

OR choose one of the following special functions:
    FN       - Function selection list
    O        - Option selection list
    END/QUIT - Terminate PDS
```

Experienced PDS users will find that they spend the majority of their time in the first 2 table displays (Log and MEMLIST), so that is what we will start using in Lab 1.

Log - A scrollable log of the PDS session is maintained in an ISPF dialog table.

MEMLIST - A scrollable member list is maintained in an ISPF dialog table. Individual PDS subcommands can be entered as line commands to process specific members.

Download the PDF

- Open a browser (Mozilla Firefox).
- Go to http://www.share.org .
- Click the Proceedings link in the left hand pane.
- Type **swiss army** in the search proceedings area text box and then click search.
- The search results should return this session; click the word ***Session:*** next to the session title.
- Click the link to PDS_–_The_Swiss_Army_Knife_of_Utilities_-_Hands-on_Lab .
- The pdf should open inside your browser.

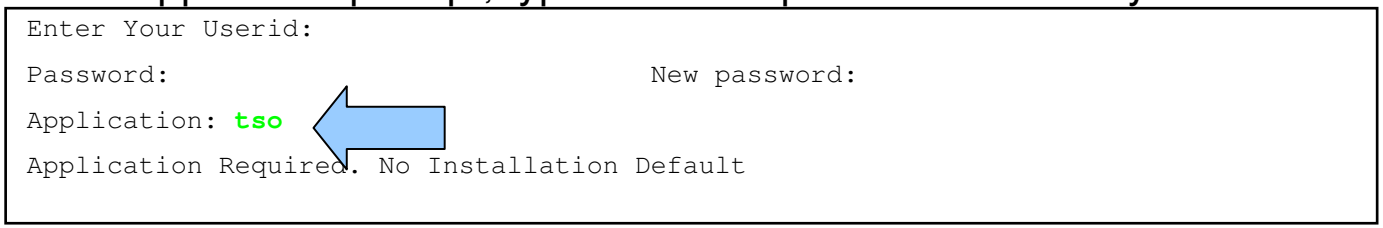
Logon to TSO

You will be logging on to the SHARE z/OS system, hosted by IBM, using the ID and password provided to you.

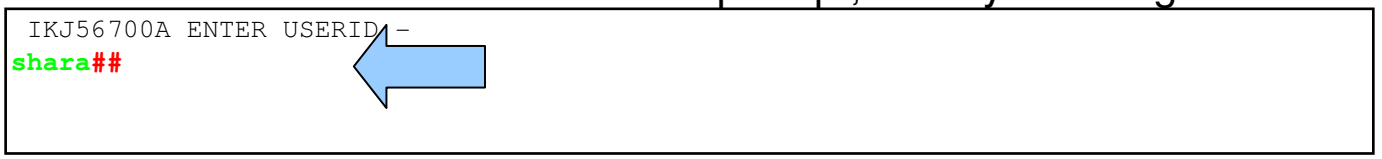
NOTE: The right Ctrl key is normally the Enter key.

To logon, follow these steps:

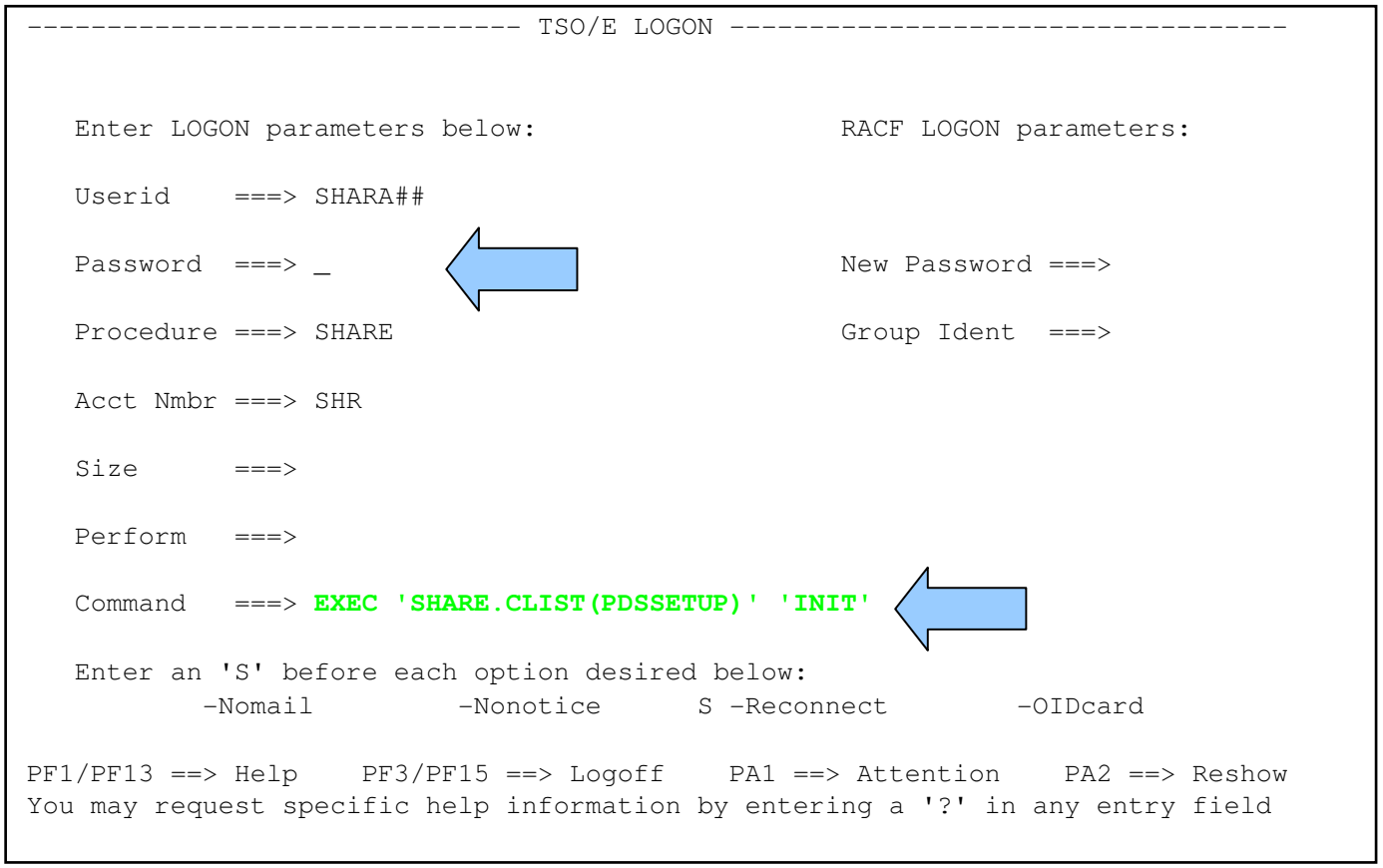
- Double click on the "mvs ws" icon on your desktop.
- At the application prompt, type **TSO** and press the Enter key.



- At the ***IKJ56700A ENTER USERID -*** prompt, enter your assigned userid: **SHARA##**

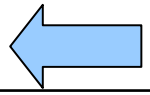


- On the TSO/E Logon Panel, enter your password. Optionally, change the Command to always invoke the PDSSETUP command if you want to restart from scratch. Remove **'INIT'** if you just want the TSOLIB run.


TSO/E LOGON
Enter LOGON parameters below:
RACF LOGON parameters:
Userid ===> SHARA##
Password ===> _
New Password ===>
Procedure ===> SHARE
Group Ident ===>
Acct Nmbr ===> SHR
Size ===>
Perform ===>
Command ===> EXEC 'SHARE.CLIST(PDSSETUP)' 'INIT'
Enter an 'S' before each option desired below:
-Nomail -Nonotice S -Reconnect -OIDcard
PF1/PF13 ==> Help PF3/PF15 ==> Logoff PA1 ==> Attention PA2 ==> Reshow
You may request specific help information by entering a '?' in any entry field

- Any time TSO writes three asterisks, press the Enter key to continue to the next output line.

```
ICH70001I SHARA29  LAST ACCESS AT 10:19:46 ON THURSDAY, MARCH 18, 2010
ICH70002I YOUR PASSWORD WILL EXPIRE IN 178 DAYS.
IKJ56455I SHARA29 LOGON IN PROGRESS AT 10:53:38 ON MARCH 18, 2010
IKJ56951I NO BROADCAST MESSAGES
             Welcome to the z/OS education system at SHARE.
     This system is exclusively for the preparation and presentation
                   of labs at the SHARE conference.

*-SYSTEM...-------------------------------------------------------------------*
* You are currently running in the SYSPLEX 'SHARPLEX', on z/OS system 'S1'.  *
* The operating system is z/OS SP7.1.1, IPLed on 10.058 at 10.45.            *
*-------------------------------------------------------------------------------*

*-ISPF/TSO...------------------------------------------------------------------*
* The dataset SHARA29.SPF.ISPPROF is allocated for your ISPF profiles.       *
* -                                                                          *
* Most TSO userids are defined in SMS ACS routines such that their datasets  *
* will automatically be directed to an SMS storage class that uses the       *
* SHTSOx volumes.                                                            *
*-------------------------------------------------------------------------------*

READY
***
```

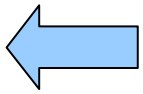


- If ISPF was launched, exit ISPF by pressing F3. If prompted for LOG/List disposition, enter **2** and press the Enter key.

```
------------ SHARE ISPF 6.1 SCROLLABLE PRIMARY OPTION MENU  ---------- S1
OPTION  ===>

  D  Alternate Dialog ===> CMD(%????)
  D2 Alternate Dialog ===> PANEL(????)
                                                                More:     +
  The time is 10:24 a.m. on Thursday, March 18, 2010 (2010.077)
  Your uid is SHARA29  dsn prefix is SHARA29   proc is SHARE    sys is S1

  0     SETTINGS     - Specify ISPF parameters
  1     VIEW         - View source data or output listing
  1P    VIEW-OE      - View/Browse files in the Open Edition file system
  2     EDIT         - Create or change source data
  2P    EDIT-OE      - Edit files in the Open Edition file system
  3     UTILITIES    - Perform utility functions
  3P    ISHELL-OE    - Open Edition ISPF shell
  4     FOREGROUND   - Invoke language processors in foreground
  5     BATCH        - Submit job for language processing
  6     COMMAND      - Enter TSO command, CLIST, or REXX exec
  7     DIALOG TEST  - Perform dialog testing
  8     LM UTILITIES - Perform library administrator utility functions
  9     IBM PRODUCTS - Additional IBM program development products
  10    SCLM         - Software Configuration and Library Manager
 Use UP and DOWN PF keys or commands to scroll MENU
```

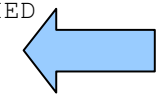
- At the ***READY*** prompt enter the command **EXEC 'SHARE.CLIST(PDSSETUP)' 'INIT'** to setup your PDS Lab environment.

```
 READY
EXEC 'SHARE.CLIST(PDSSETUP)' 'INIT'
```



- This will create a '&*userid*.TEST.PDS' dataset and activate a TSOLIB for programs that are used by PDS.

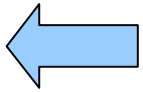
```
 READY
EXEC 'SHARE.CLIST(PDSSETUP)' 'INIT'
 WRITE Copy installation members to TEST.PDS
 Copy installation members to TEST.PDS
 IDY00029I There are no libraries identified for TSOLIB being searched.
 IF INIT = INIT THEN
 DO
 END
 IDC3901I ERROR QUALIFYING SHARA29.TEST.PDS
 IDC3902I ** DEFAULT SERVICE ROUTINE ERROR CODE 20, LOCATE ERROR CODE 8
 IDC0014I LASTCC=8
 PDS484W COPY IS IN PROGRESS
 IEB1135I IEBCOPY  FMID HDZ1A10  SERVICE LEVEL NONE     DATED 20090406 DFSMS 01.
11.00 z/OS    01.11.00 HBB7760  CPU 2097
 IEB1035I SHARA29  SHARE    SHARE    10:27:19 THU 18 MAR 2010 PARM=''
  COPY    O=SYS00011,I=SYS00006
  S M=$$$DOC,$$STRUCT,PDSHELP,P86LO@P,P86MN@P,P86QREF,P86UNDOC
 IEB1013I COPYING FROM PDS   INDD=SYS00006 VOL=SHR004 DSN=SHARE.PDS.INSTALL
 IEB1014I           TO PDS  OUTDD=SYS00011 VOL=SHTSO4 DSN=SHARA29.TEST.PDS
 IEB167I FOLLOWING MEMBER(S) COPIED FROM INPUT DATA SET REFERENCED BY SYS00006
 IEB154I $$$DOC   HAS BEEN SUCCESSFULLY COPIED
 IEB154I $$STRUCT HAS BEEN SUCCESSFULLY COPIED
 IEB154I PDSHELP  HAS BEEN SUCCESSFULLY COPIED
 ***
```



Launch ISPF

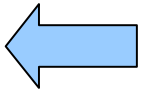
- Any time TSO writes three asterisks, press the Enter key to continue to the next output line.

```
READY
***
```

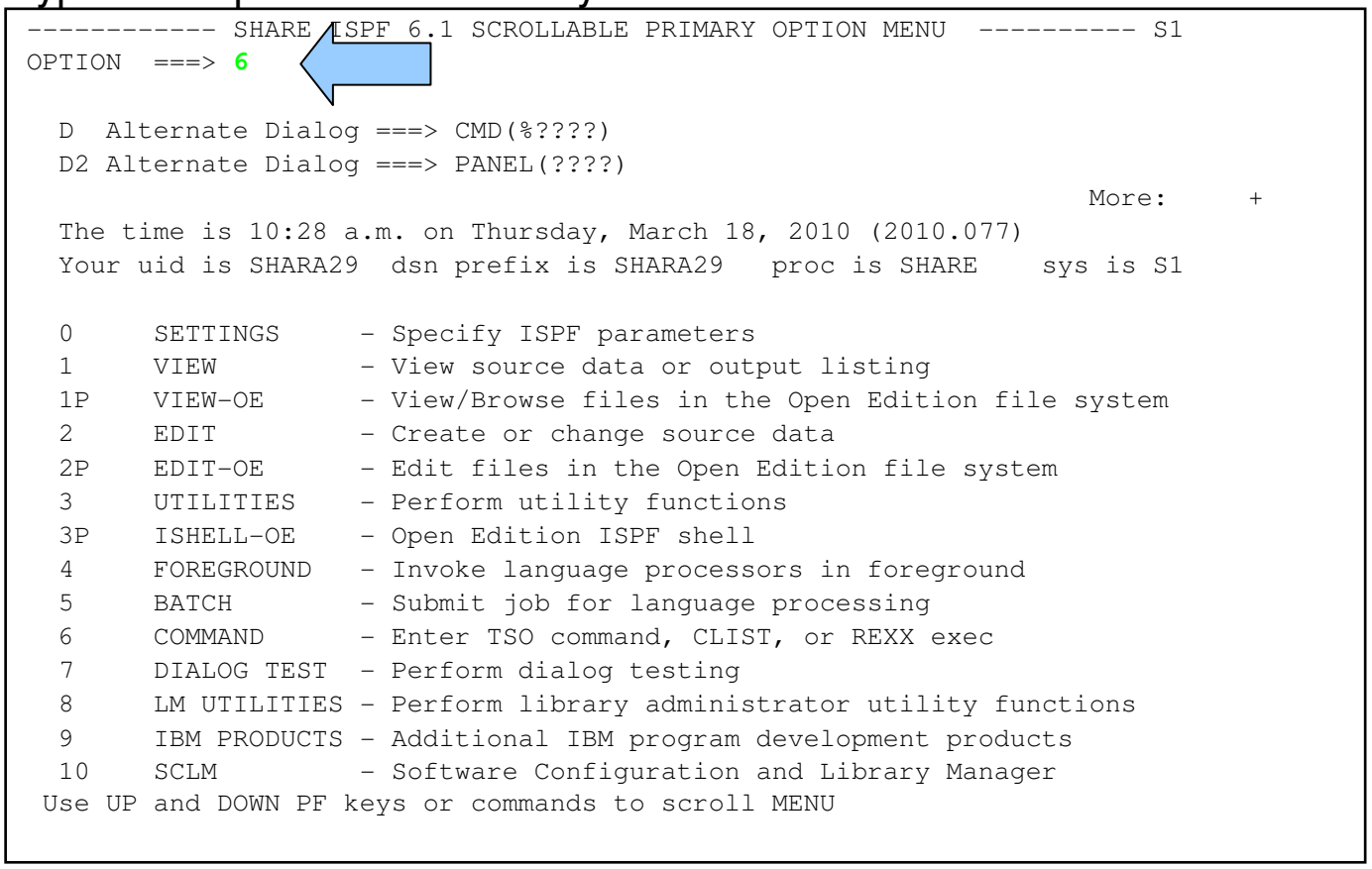


- Type **ISPF** and press the Enter key.

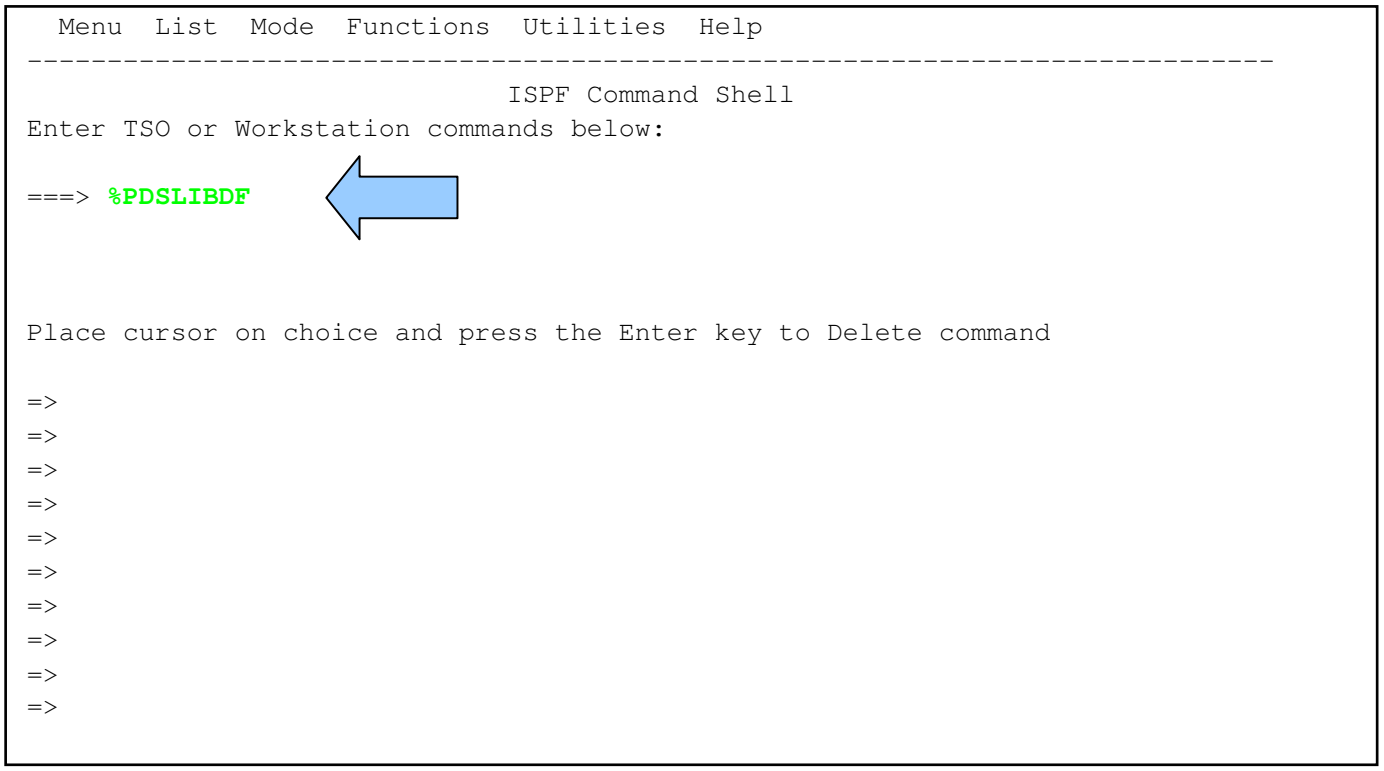
```
IEB154I P86LO@P  HAS BEEN SUCCESSFULLY COPIED
IEB154I P86MN@P  HAS BEEN SUCCESSFULLY COPIED
IEB154I P86QREF  HAS BEEN SUCCESSFULLY COPIED
IEB154I P86UNDOC HAS BEEN SUCCESSFULLY COPIED
IEB1098I 7 OF 7 MEMBERS COPIED FROM INPUT DATA SET REFERENCED BY SYS00006
IEB144I THERE ARE 1 UNUSED TRACKS IN OUTPUT DATA SET REFERENCED BY SYS00011
IEB149I THERE ARE 8 UNUSED DIRECTORY BLOCKS IN OUTPUT DIRECTORY
IEB147I END OF JOB - 0 WAS HIGHEST SEVERITY CODE

EXIT
READY
ispf
```



- Type **6** and press the Enter key.



- Type **%PDSLIBDF** and press the Enter key. This will execute the necessary ISPF commands to define the panel and message libraries used by PDS before invoking PDS.

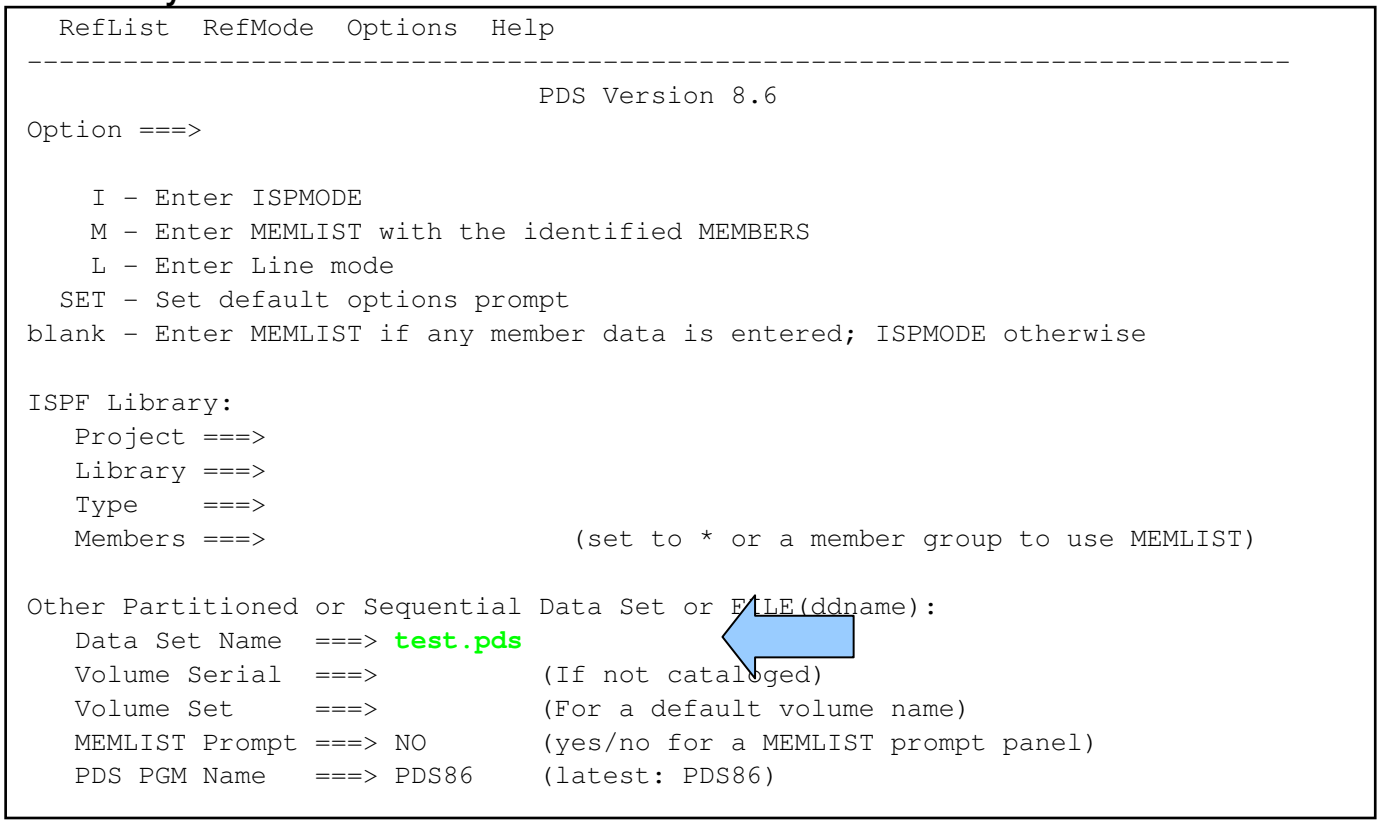


Launch PDS on a PDS

%PDSSETUP created a partitioned data set we will use in most of the lab exercises.

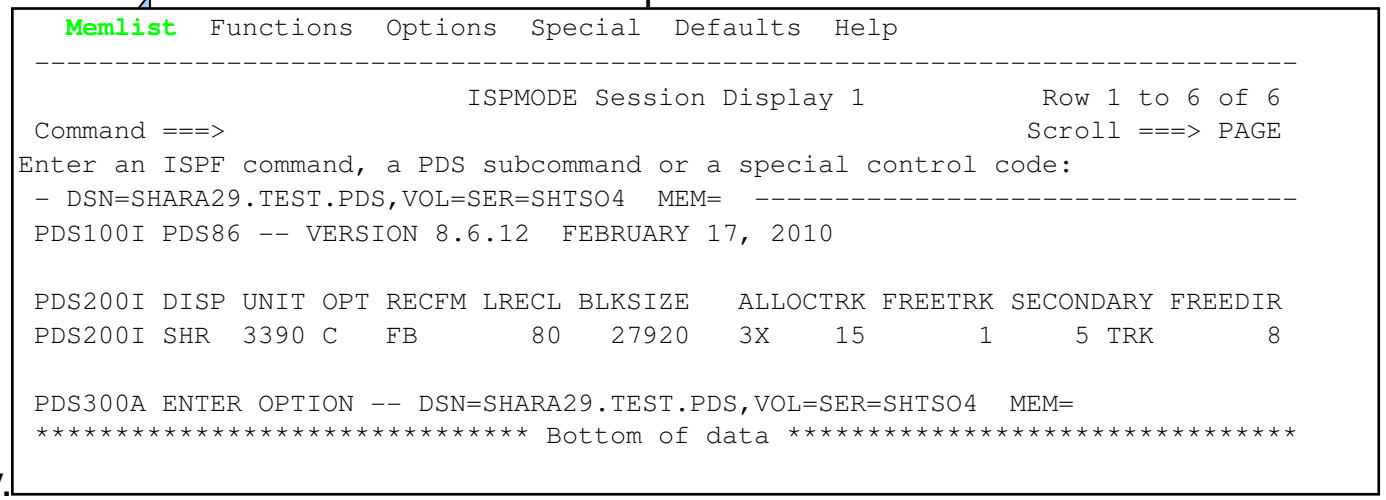
By default, we will enter ISPMODE.

- Enter **TEST.PDS** in the ***DATA SET NAME*** field on the PDS entry panel and press the Enter key.

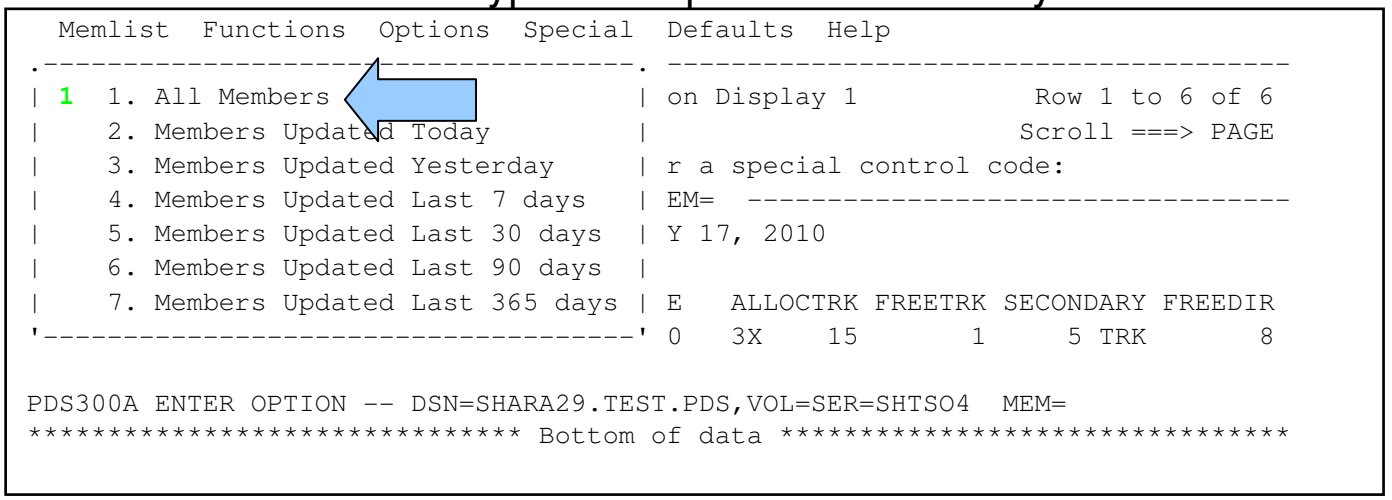


The ISPMODE Log is displayed upon entry. PDS will display numbered messages if MSGID is set in the TSO PROFILE. These messages are documented in the PDS member on SYSHELP. Message PDS200I is the output of the DSNAME subcommand which is issued internally by PDS at startup. The PDS dialog function panels display action bar choice menus.

- Double click on the ***Memlist*** action bar menu choice or position the cursor on the ***Memlist*** action bar menu choice and press the Enter key.



- Select ***1. All Members***. Type **1** and press the Enter key.



- You will get the member list display.

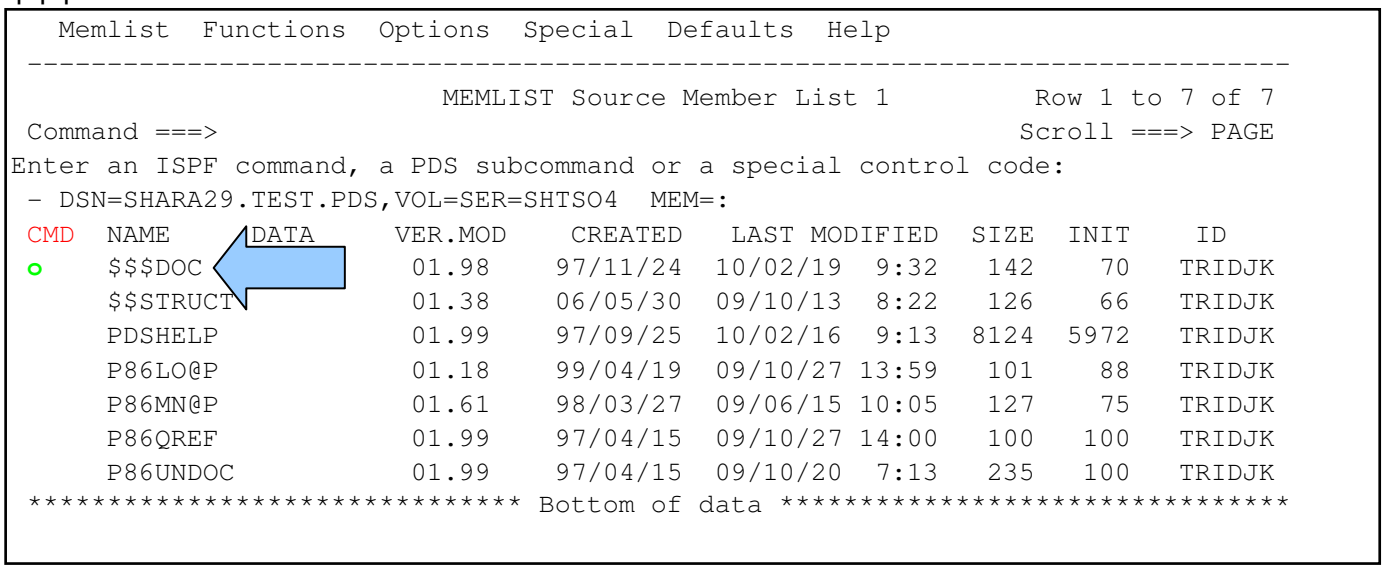
```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 7 of 7
Command ===>                                                   Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO4  MEM=:
CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
     $$$DOC             01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
     $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
     PDSHELP            01.99    97/09/25  10/02/16  9:13  8124  5972   TRIDJK
     P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
     P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
     P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
     P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
******************************* Bottom of data ********************************
```

Lab Exercise 1

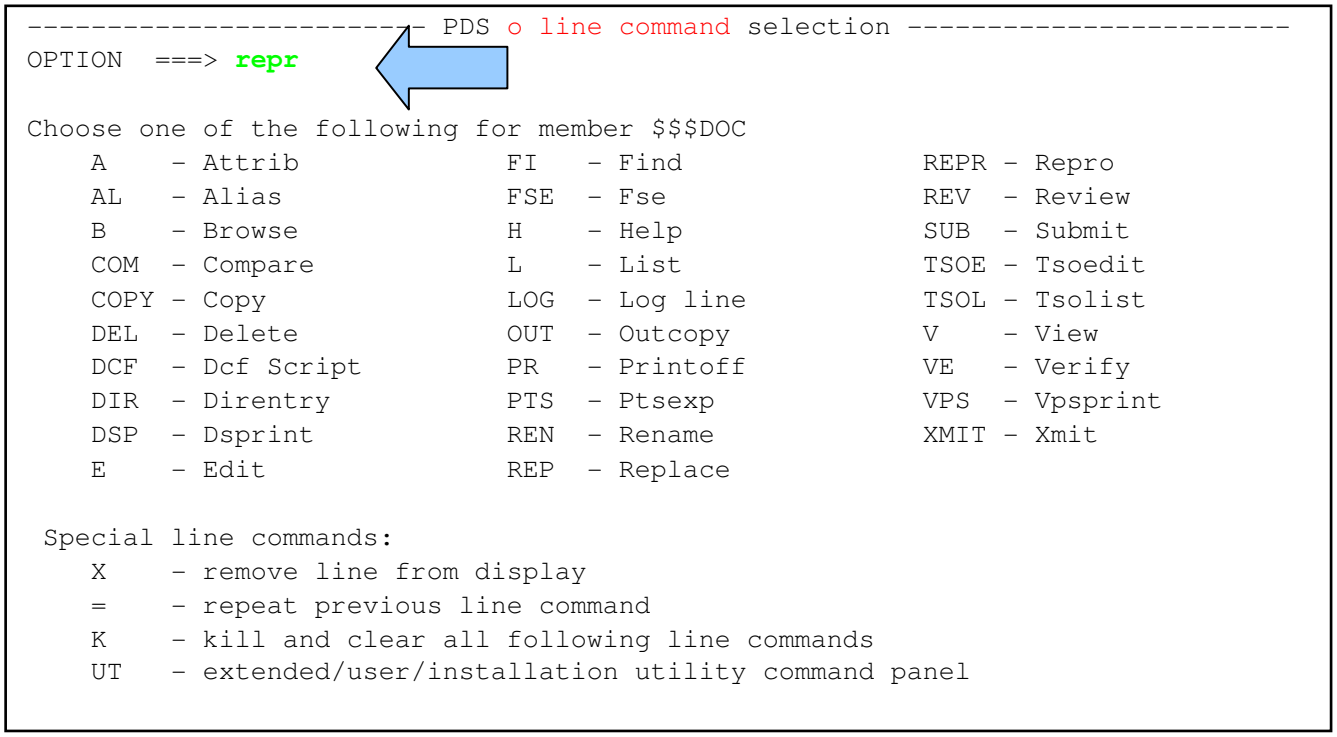
Objectives:

1. Copy (REPRO) a PDS member giving it a new name.
2. Simulate replacing a text string.
3. Replace the text string.
4. Compare the members.
5. Delete a member.
6. Restore the deleted PDSHELP member.

- The dialog "O" command will display a myriad of ISPF Tutorial panels from which you can select the subcommand you want to execute and then receive a list of operands for that subcommand. The "O" command can be entered as a primary command or as a line command. Enter **O** on the MEMLIST line command (***CMD***) area of member $$$DOC.



- Enter "**REPR**" on the command line.



```
------------------------- PDS o line command selection -------------------------
OPTION  ===> repr

Choose one of the following for member $$$DOC
    A     - Attrib              FI    - Find                REPR - Repro
    AL    - Alias               FSE   - Fse                 REV  - Review
    B     - Browse              H     - Help                SUB  - Submit
    COM   - Compare             L     - List                TSOE - Tsoedit
    COPY  - Copy                LOG   - Log line            TSOL - Tsolist
    DEL   - Delete              OUT   - Outcopy             V    - View
    DCF   - Dcf Script          PR    - Printoff            VE   - Verify
    DIR   - Direntry            PTS   - Ptsexp              VPS  - Vpsprint
    DSP   - Dsprint             REN   - Rename              XMIT - Xmit
    E     - Edit                REP   - Replace

 Special line commands:
    X     - remove line from display
    =     - repeat previous line command
    K     - kill and clear all following line commands
    UT    - extended/user/installation utility command panel
```

- Enter the **as($$$doc2)** operand on the ***REPRO line command*** prompt panel.

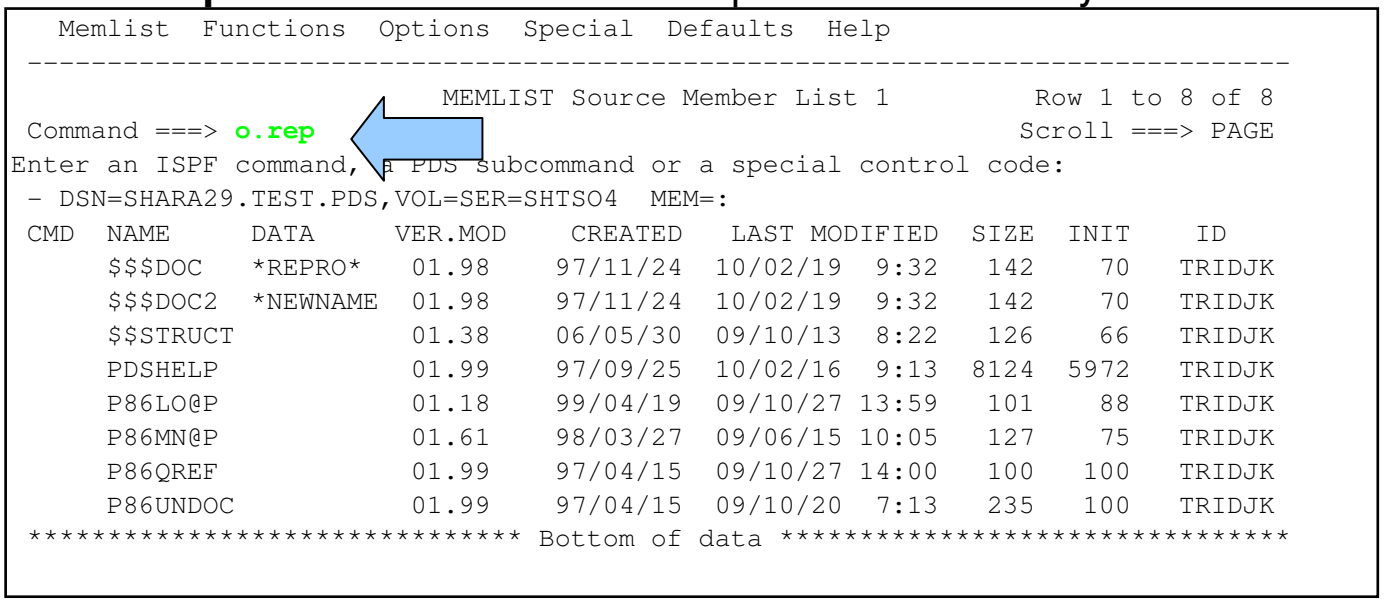
```
------------------------ o.repr    REPRO line command ------------------------
OPTION  ===>

Enter any operands below for REPRO  $$$DOC
===> as($$$doc2)


Operands:  ADDZAP               - for load modules, to add a ZAP IDR record
           ALIAS/NOALIAS        - to include associated members
           AS(pname)/TO(pname)  - to create new members
           MAXBLK(num)          - for non-load members, maximum block size
           REPLACE/NOREPLACE    - for AS or TO, to replace existing members

Defaults:  NOALIAS, MAXBLK(current data set blksize), NOREPLACE
```

- The MEMLIST table is displayed again, this time with the newly created member $$$DOC2.

```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 8 of 8
 Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO4  MEM=:
 CMD   NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
       $$$DOC   *REPRO*   01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
       $$$DOC2  *NEWNAME            97/11/24  10/02/19  9:32   142    70   TRIDJK
       $$STRUCT            01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
       PDSHELP             01.99    97/09/25  10/02/16  9:13  8124  5972   TRIDJK
       P86LO@P             01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
       P86MN@P             01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
       P86QREF             01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
       P86UNDOC            01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ****************************** Bottom of data ********************************
```

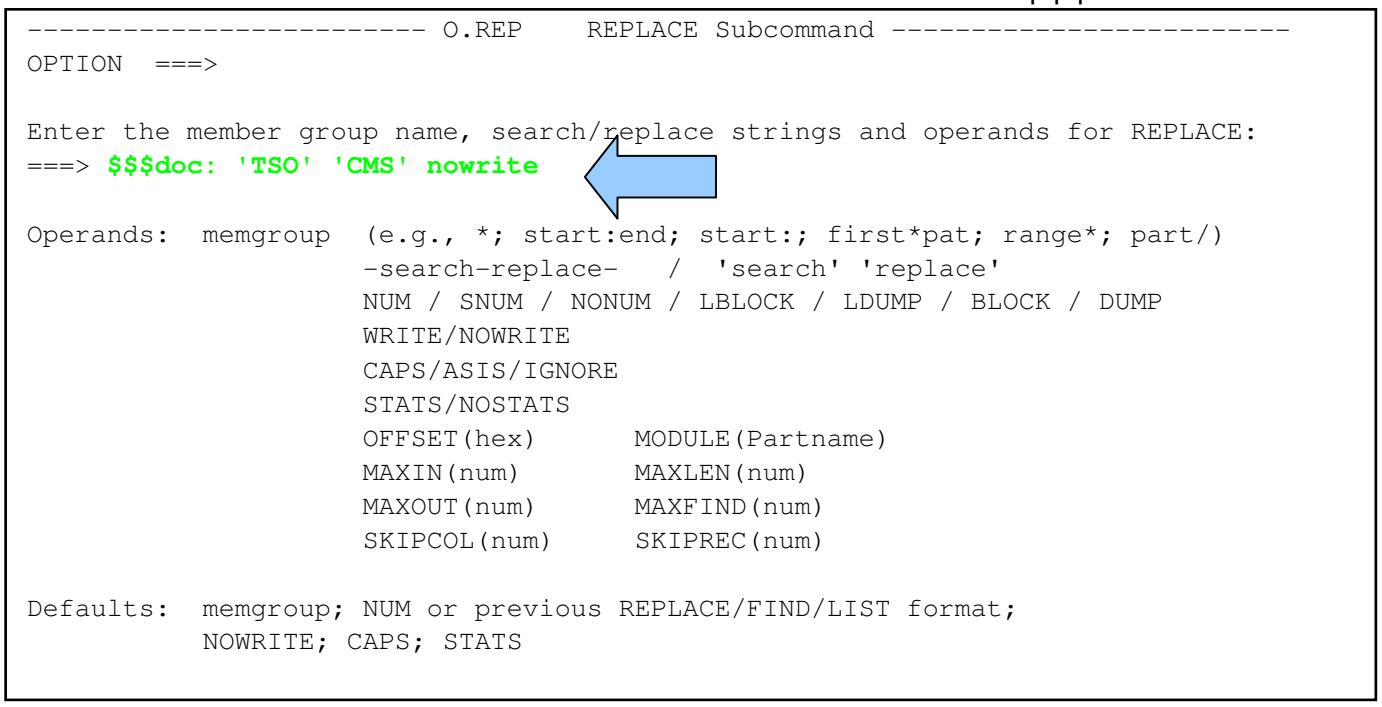
Now we will replace a string of text with a new value.

- Enter **o.rep** on the command line and press the Enter key.

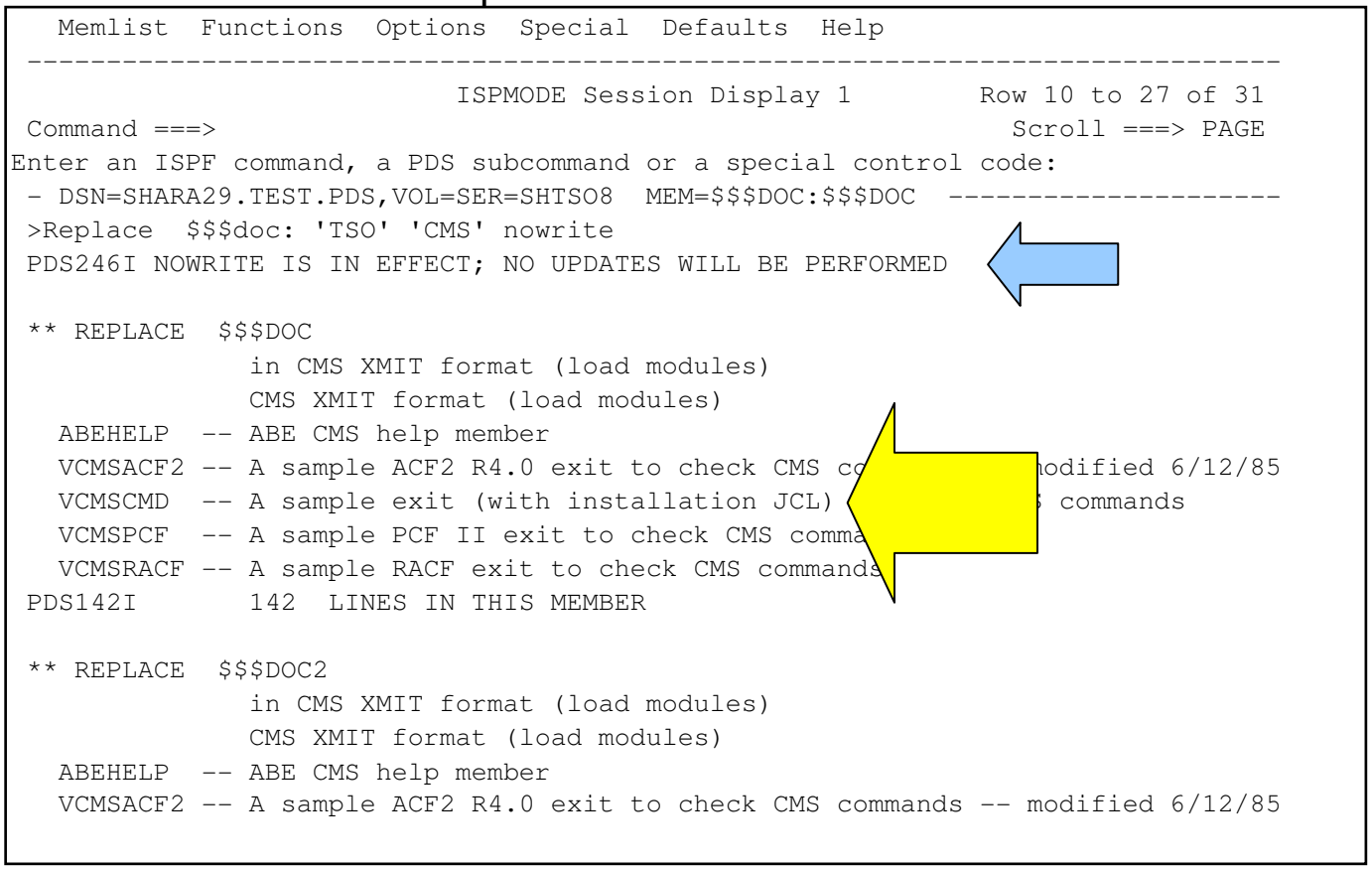


```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 8 of 8
Command ===> o.rep                                             Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO4  MEM=:
CMD  NAME      DATA      VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
     $$$DOC    *REPRO*    01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
     $$$DOC2   *NEWNAME   01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
     $$STRUCT             01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
     PDSHELP              01.99    97/09/25  10/02/16  9:13  8124  5972   TRIDJK
     P86LO@P              01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
     P86MN@P              01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
     P86QREF              01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
     P86UNDOC             01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
******************************* Bottom of data ********************************
```

- When the ***o.rep*** dialog command is issued from the command line, the prompting panel asks for a member group name. We will explain member groups later. For now, enter:
  $$$doc: 'TSO' 'CMS' nowrite
- This will include all members whose name starts with $$$doc.

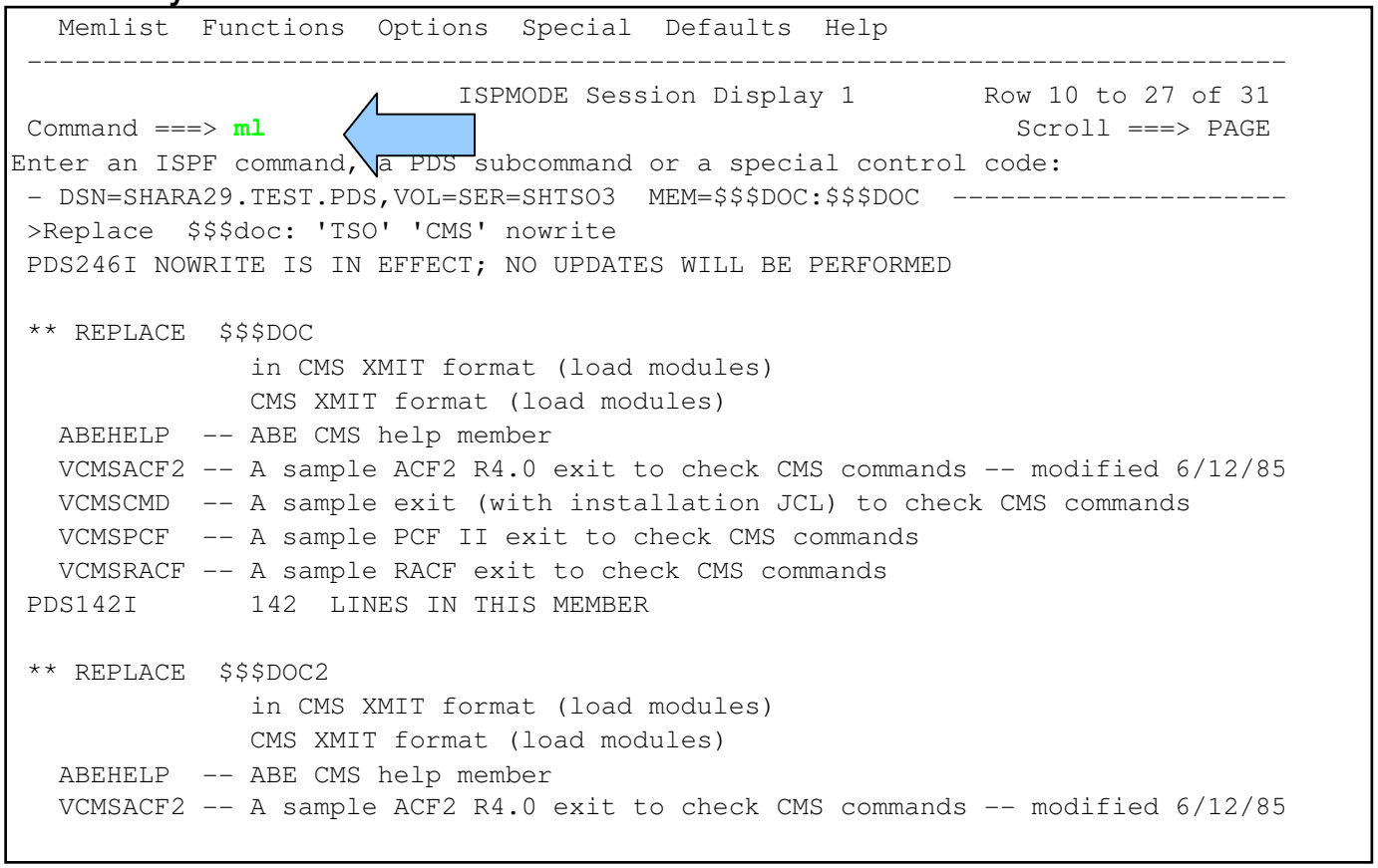


- And the results are shown. You specified the NOWRITE option, so the display shows what would have been replaced.

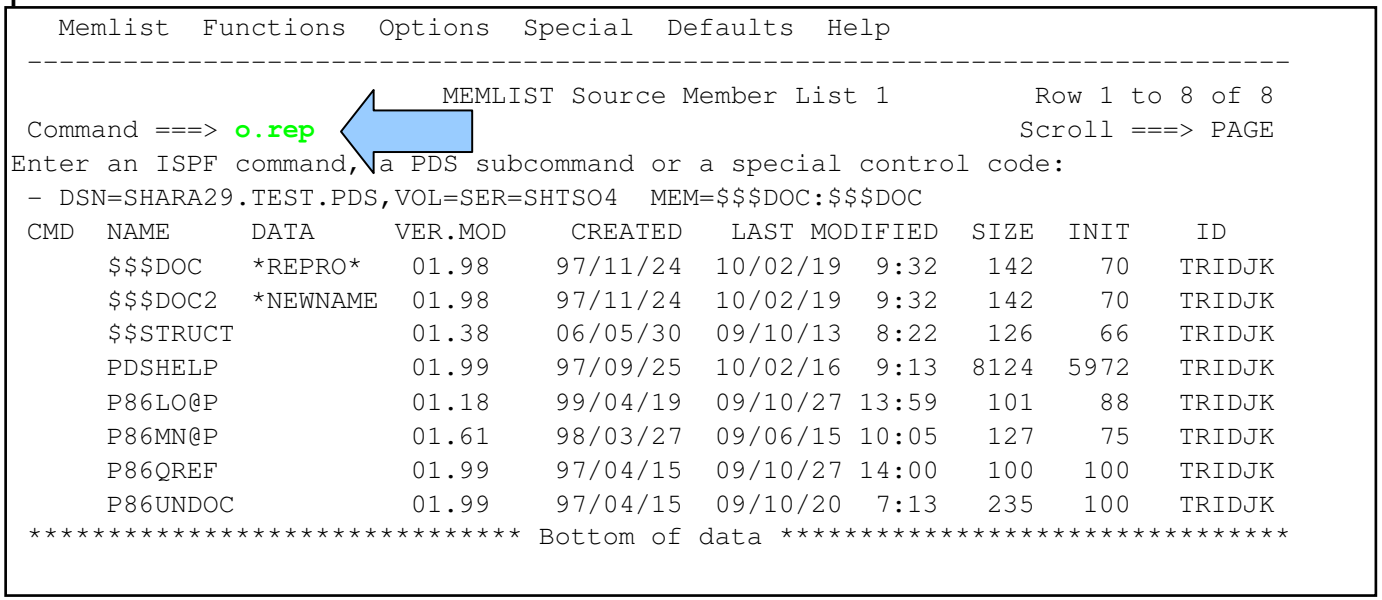


```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                            ISPMODE Session Display 1        Row 10 to 27 of 31
 Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=$$$DOC:$$$DOC  ---------------------
 >Replace  $$$doc: 'TSO' 'CMS' nowrite
 PDS246I NOWRITE IS IN EFFECT; NO UPDATES WILL BE PERFORMED

 ** REPLACE  $$$DOC
               in CMS XMIT format (load modules)
               CMS XMIT format (load modules)
   ABEHELP  -- ABE CMS help member
   VCMSACF2 -- A sample ACF2 R4.0 exit to check CMS co                odified 6/12/85
   VCMSCMD  -- A sample exit (with installation JCL)                  commands
   VCMSPCF  -- A sample PCF II exit to check CMS comma
   VCMSRACF -- A sample RACF exit to check CMS commands
 PDS142I       142  LINES IN THIS MEMBER

 ** REPLACE  $$$DOC2
               in CMS XMIT format (load modules)
               CMS XMIT format (load modules)
   ABEHELP  -- ABE CMS help member
   VCMSACF2 -- A sample ACF2 R4.0 exit to check CMS commands -- modified 6/12/85
```

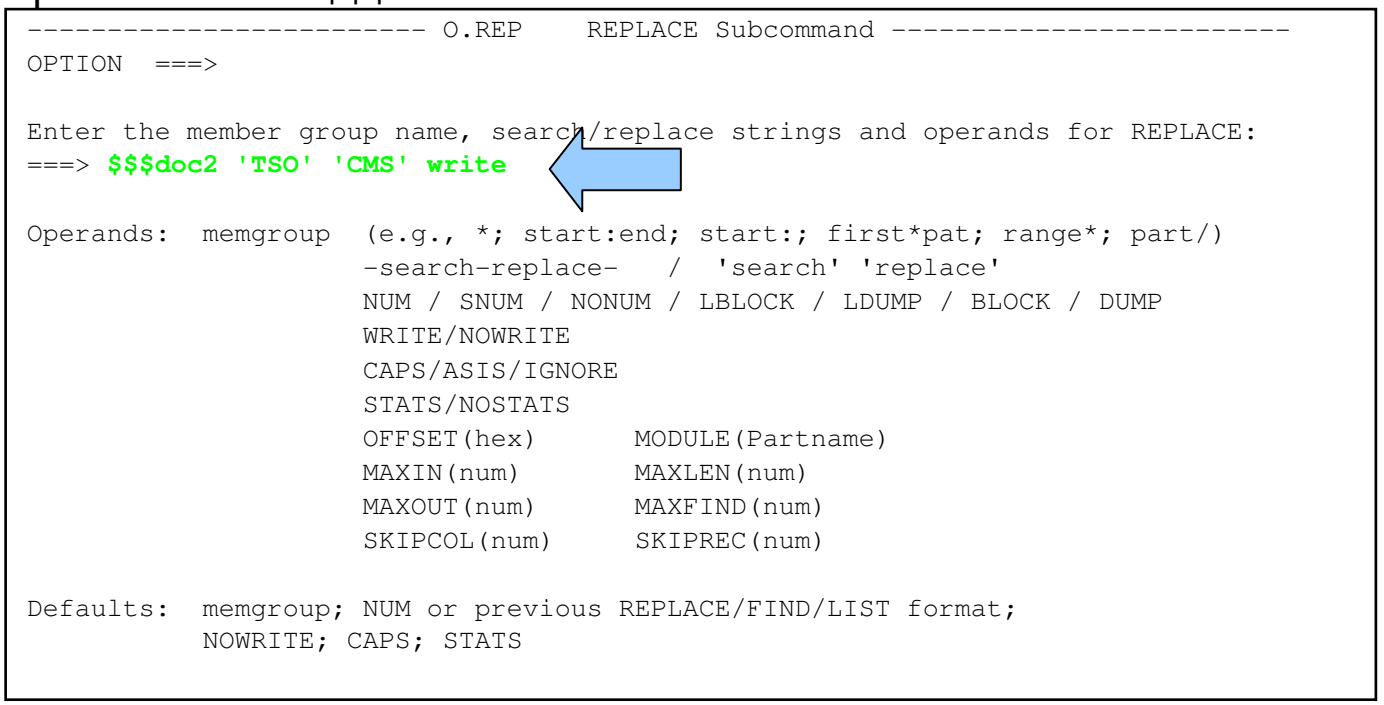
- To return to the MEMLIST table display, enter **ML** on the command line and press the Enter key.



- This time we will update just the $$$DOC2 member. We can stack commands, so this time enter **o.rep** on the command line and press the Enter key to return to the prompt panel.



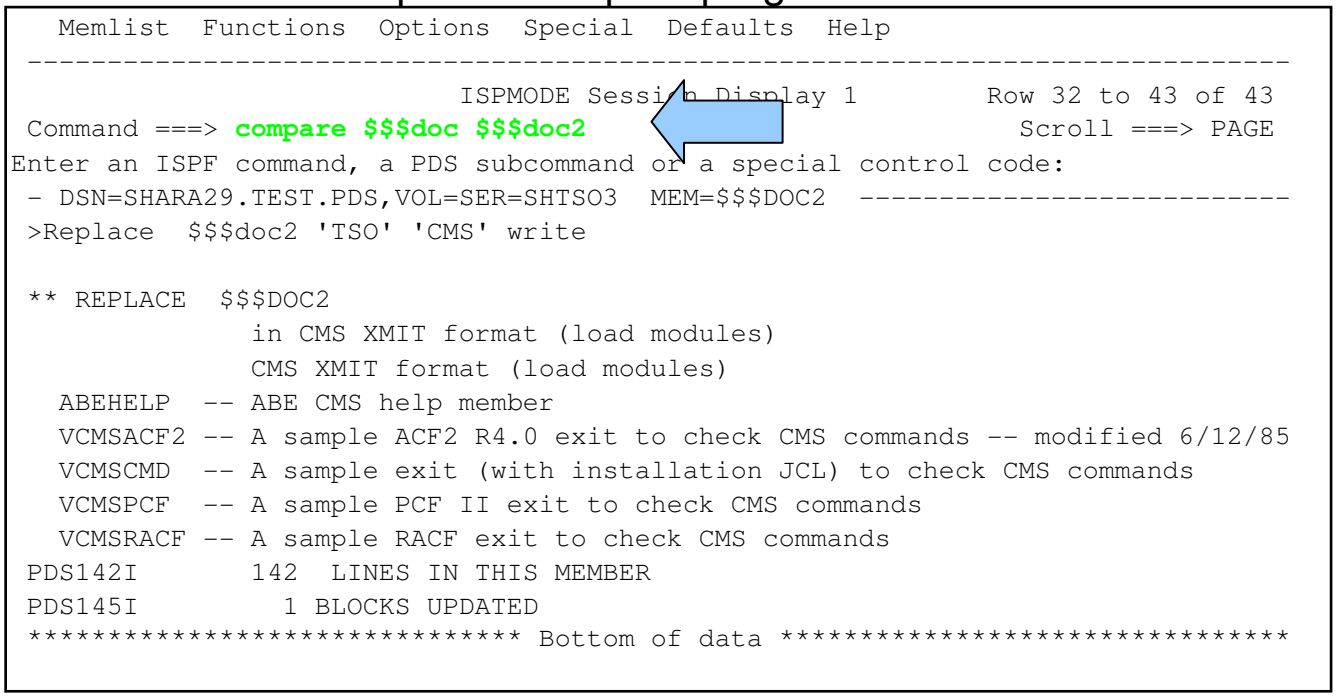
- Change the operands to **$$$doc2 'TSO' 'CMS' write** and press the Enter key to update member $$$DOC2.



- And you get the results.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          ISPMODE Session Display 1        Row 32 to 43 of 43
 Command ===>                                               Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=$$$DOC2  ---------------------------
 >Replace  $$$doc2 'TSO' 'CMS' write

 ** REPLACE  $$$DOC2
              in CMS XMIT format (load modules)
              CMS XMIT format (load modules)
   ABEHELP  -- ABE CMS help member
   VCMSACF2 -- A sample ACF2 R4.0 exit to check CMS commands -- modified 6/12/85
   VCMSCMD  -- A sample exit (with installation JCL) to check CMS commands
   VCMSPCF  -- A sample PCF II exit to check CMS commands
   VCMSRACF -- A sample RACF exit to check CMS commands
 PDS142I       142  LINES IN THIS MEMBER
 PDS145I         1 BLOCKS UPDATED
 ******************************* Bottom of data ********************************
```

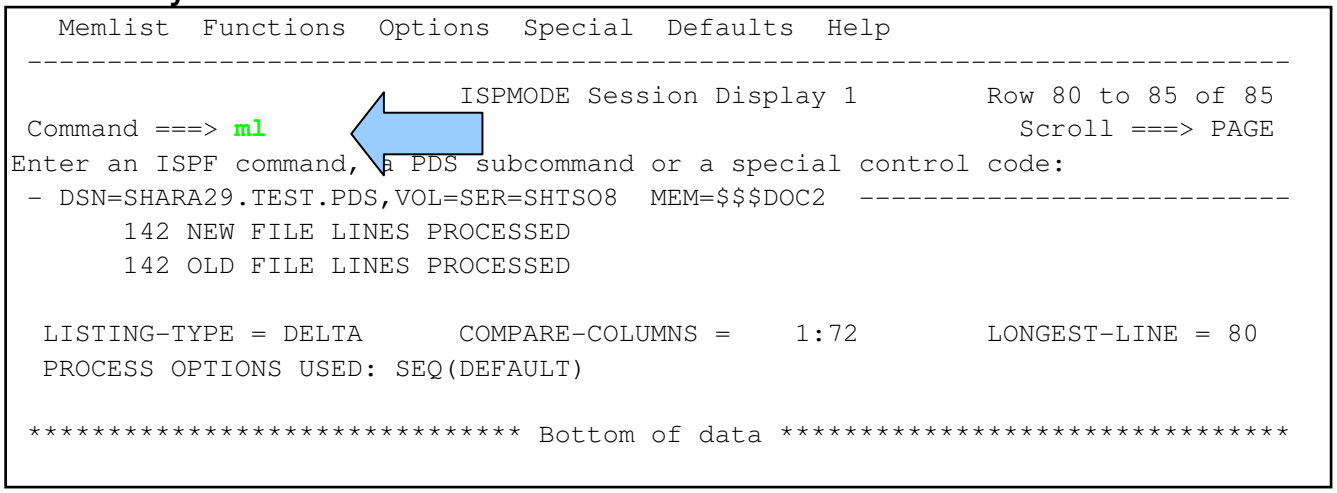
- Enter **compare $$$doc $$$doc2** on the command line and press the Enter key. This invokes the ISPF Super-C Compare program.



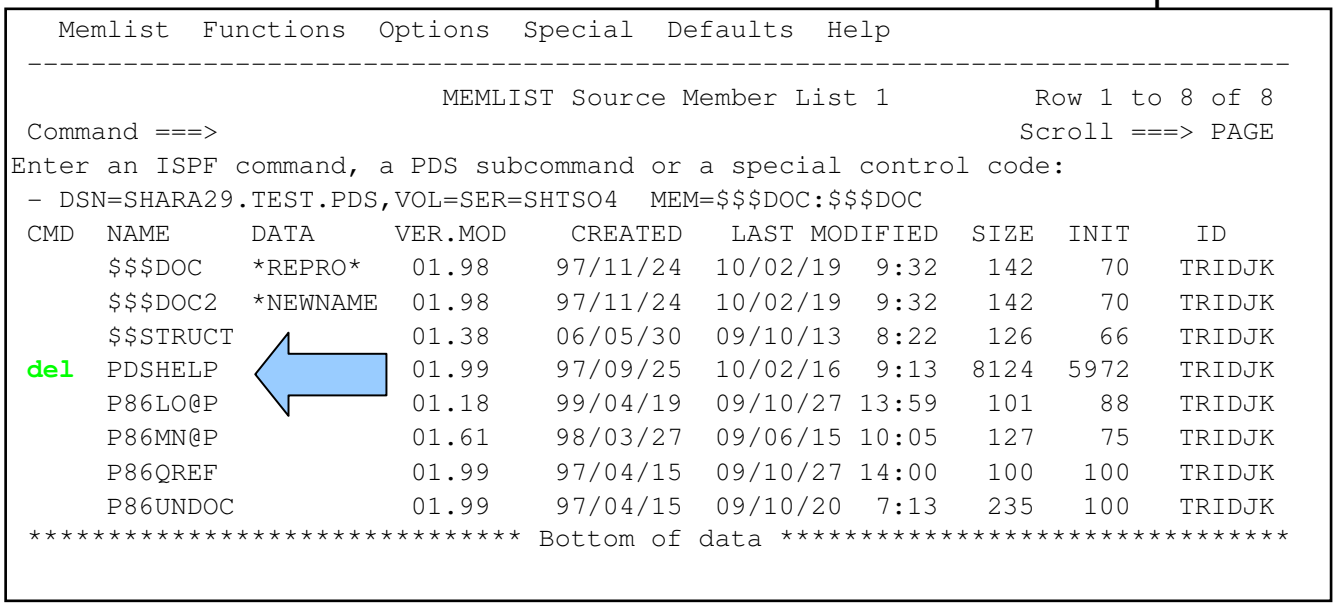
- And you get the results. Scroll down using PF8, twice to reach the bottom.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          ISPMODE Session Display 1        Row 44 to 61 of 85
 Command ===>                                               Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=$$$DOC2  --------------------------
 >compare $$$doc $$$doc2
 1  ISRSUPC   -   MVS/PDF FILE/LINE/WORD/BYTE/SFOR COMPARE UTILITY- ISPF FOR z/O
  NEW: SHARA29.TEST.PDS($$$DOC2)                          OLD: SHARA29.TEST

                      LISTING OUTPUT SECTION (LINE COMPARE)

  ID       SOURCE LINES
      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----

  I -               in CMS XMIT format (load modules)
  D -               in TSO XMIT format (load modules)

  I -               CMS XMIT format (load modules)
  D -               TSO XMIT format (load modules)

  I -   ABEHELP  -- ABE CMS help member
  D -   ABEHELP  -- ABE TSO help member
```

- To return to the MEMLIST table display, enter **ML** on the command line and press the Enter key.



- Enter **DEL** on the line command for member PDSHELP and press the Enter key.



```
  Memlist  Functions  Options  Special  Defaults  Help
------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 8 of 8
 Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO4  MEM=$$$DOC:$$$DOC
 CMD  NAME      DATA      VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC    *REPRO*    01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
      $$$DOC2   *NEWNAME   01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
      $$STRUCT             01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
 del  PDSHELP              01.99    97/09/25  10/02/16  9:13  8124  5972   TRIDJK
      P86LO@P              01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P              01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF              01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC             01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ******************************* Bottom of data ********************************
```

Suddenly you remember that PDSHELP is the TSO Help member for PDS and that the only backup of the member is a printout of 8100 lines. You could get the listing and start power typing in ISPF Edit. But then you recall one of the most powerful PDS weapons in the arsenal. The RESTORE subcommand can resurrect a previously deleted member as long as the PDS has not been compressed. One potential problem is that many changes and deletions may have been made to this partitioned data set.

If you just try to do a restore then you will walk through every location where a previous member or changed version once existed.

One way to speed that up is to know the relative track and record (TTR) location of where the member was. Not likely!

Or you need to know something unique that was in the member. Sounds like we found a new command to try.

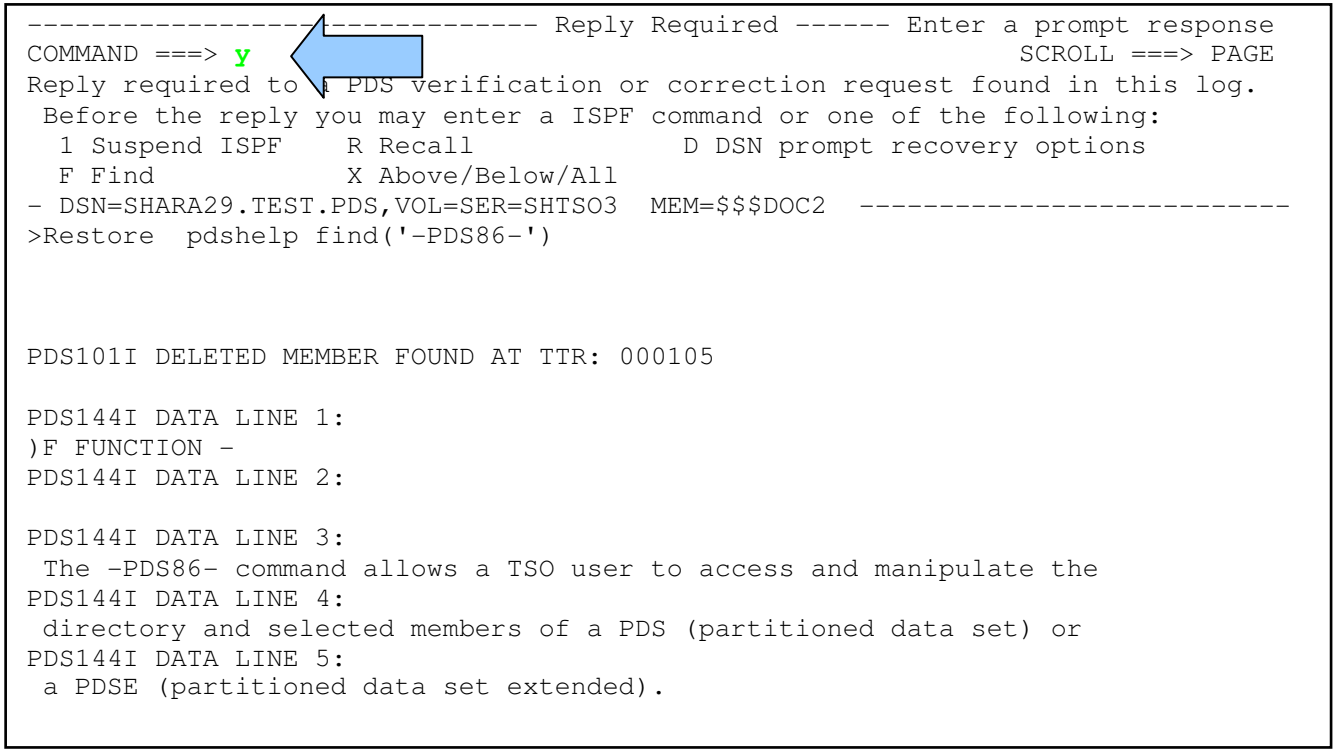
- Enter **o.rest** in the primary command field and press the Enter key. Did you notice the PDSHELP member is no longer on the MEMLIST display?

```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 7 of 7
 Command ===> o.rest                                          Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=$$$DOC2
 CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC   *REPRO*   01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
      $$$DOC2  *NEWNAME  01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
      $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
      P86LO@P            .18      99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ******************************* Bottom of data ********************************
```

- Now you provide the name of the member we want to restore it to and something we know was only in the deleted member. Type **pdshelp find('-PDS86-')** and press the Enter key.

```
------------------------- O.RES    RESTORE Subcommand -------------------------
OPTION ===>

Enter the member name desired and any operands below for RESTORE:
===> pdshelp find('-PDS86-')


Operands:  member    - name to use for the restored member
           TTR(ttr)  - one to six hex digit ttr address or search start address
           REPEAT    - restore multiple members (mbr00001, mbr00002, ...)
           NOREPEAT  - restore only a single member
           DISPLAY   - display data from deleted members
           NODISPLAY - display no data from deleted members
           PROMPT    - prompt before restoring a member
           NOPROMPT  - do not prompt before restoring a member
           COUNT(nm) - number of lines to display from a member
           LIKE(xyz) - take attributes from member XYZ
           FIND('s') - a character string which must be found before a restore
           MODULE(n) - a partial CSECT or entry name which must be present
           CAPS/ASIS - case of the FIND argument
           TEST      - simulate the resurrection of deleted members

Defaults:  TTR(0), DISPLAY, PROMPT, COUNT(5), CAPS
```

- The Log is displayed with the first five lines of a member that contained the string ***-PDS86-***. In this example, only one member matches. Enter **Y** and press the Enter key to restore the member as PDSHELP.

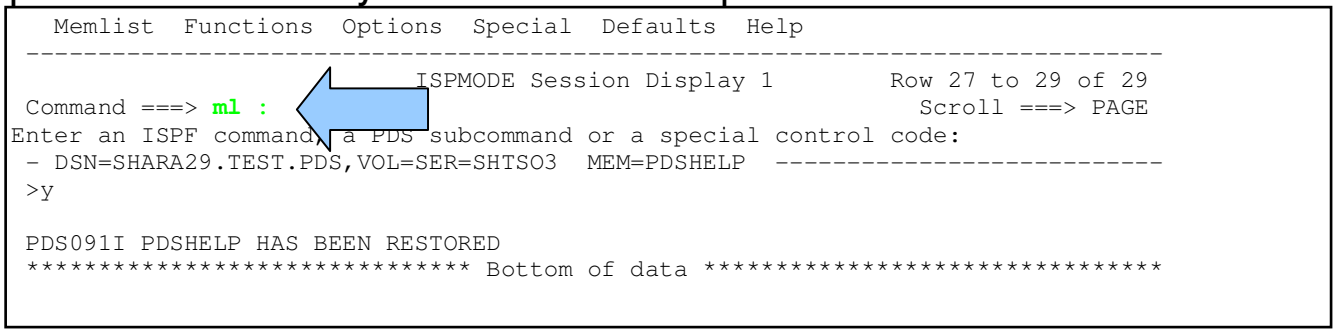


```
------------------------------ Reply Required ------ Enter a prompt response
COMMAND ===> y                                                SCROLL ===> PAGE
Reply required to a PDS verification or correction request found in this log.
 Before the reply you may enter a ISPF command or one of the following:
  1 Suspend ISPF    R Recall             D DSN prompt recovery options
  F Find            X Above/Below/All
- DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=$$$DOC2  --------------------------
>Restore  pdshelp find('-PDS86-')



PDS101I DELETED MEMBER FOUND AT TTR: 000105

PDS144I DATA LINE 1:
)F FUNCTION -
PDS144I DATA LINE 2:

PDS144I DATA LINE 3:
 The -PDS86- command allows a TSO user to access and manipulate the
PDS144I DATA LINE 4:
 directory and selected members of a PDS (partitioned data set) or
PDS144I DATA LINE 5:
 a PDSE (partitioned data set extended).
```

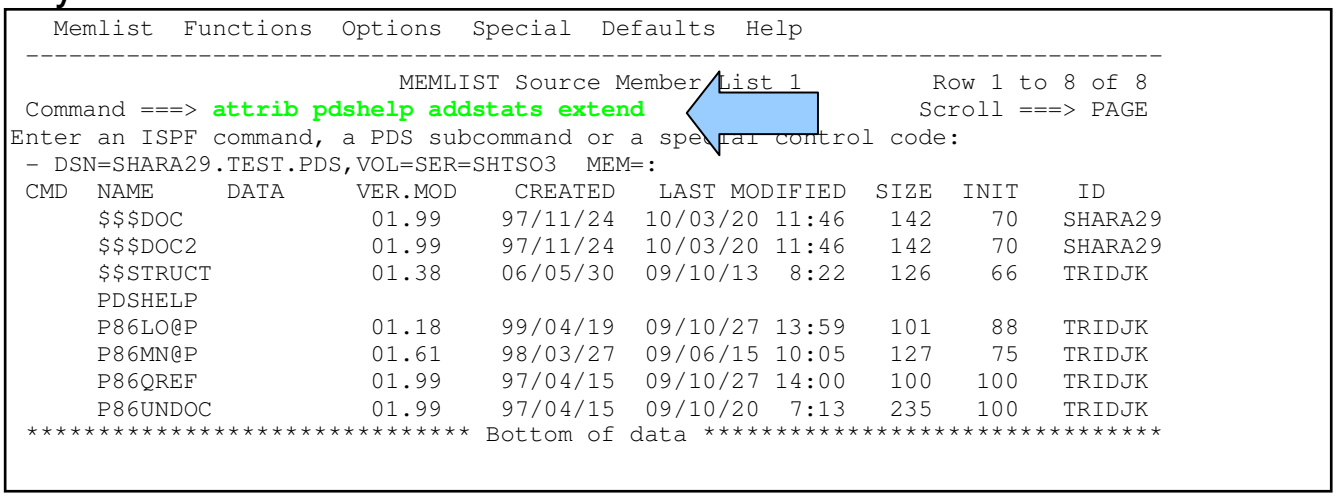
- And you get the results.

```
 Memlist Functions Options Special Defaults Help
 ------------------------------------------------------------------------------
 ISPMODE Session Display 1 Row 25 to 26 of 26
 Command ===>                                                 Scroll ===> CSR
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=TRIDJK.TEST.PDS,VOL=SER=PERM19 MEM=PDSHELP ----------------------------
>y

PDS091I PDSHELP HAS BEEN RESTORED
 ******************************** Bottom of data ********************************
```

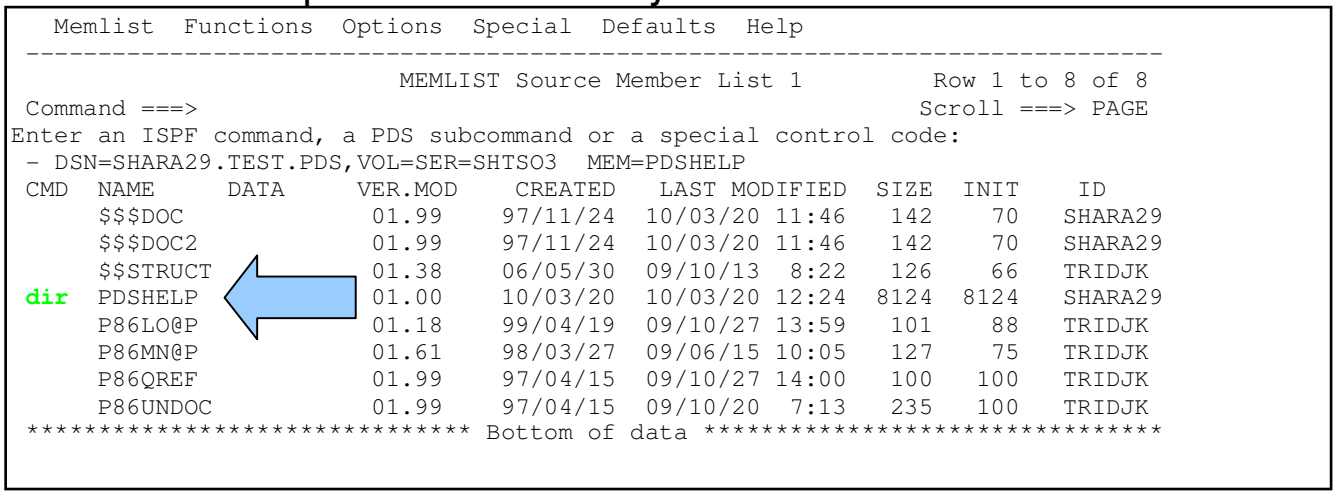
- Refresh the MEMLIST table display, this time enter **ML :** on the command line and press the Enter key. Note: there is a space between ML and the colon (:).



- Looking at the MEMLIST display, you discover that the ISPF statistics were not restored. This is because the statistics are stored in the PDS directory entry and not with the data. To generate new ISPF stats, you can use the ATTRIB subcommand. Enter **attrib pdshelp addstats extend** on the command line and press the Enter key.



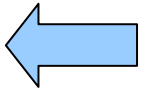
- PDS can show the directory block entry. Enter **dir** on the line command to the left of PDSHELP and press the Enter key.



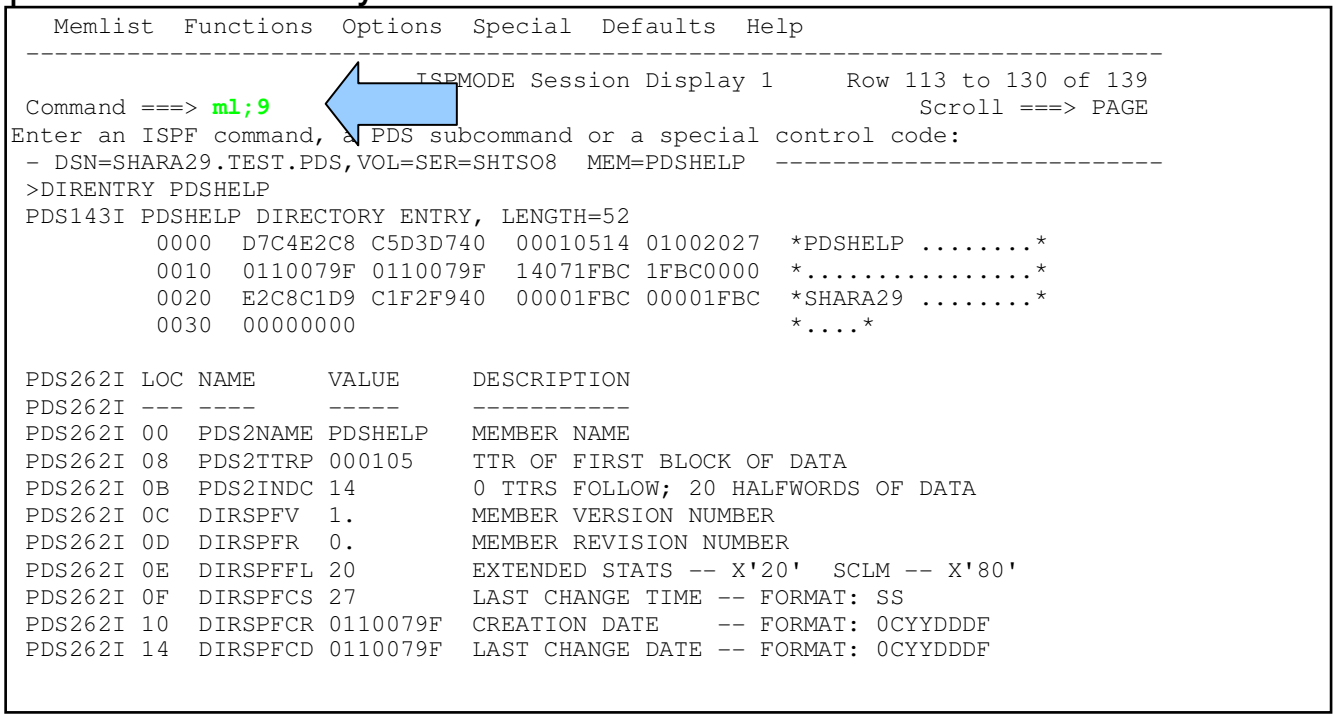
```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                         MEMLIST Source Member List 1         Row 1 to 8 of 8
Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=PDSHELP
 CMD   NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC             01.99    97/11/24  10/03/20 11:46   142    70   SHARA29
      $$$DOC2            01.99    97/11/24  10/03/20 11:46   142    70   SHARA29
      $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
 dir  PDSHELP            01.00    10/03/20  10/03/20 12:24  8124  8124   SHARA29
      P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ******************************* Bottom of data ********************************
```

- The DIRENTRY subcommand will display the directory entry in hex dump format and list the elements of the directory entry. Notice that the ADDSTATS EXTEND operands of the ATTRIB subcommand created “extended” ISPF statistics. These were introduced in ISPF 6.1 included with z/OS 1.11.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          ISPMODE Session Display 1        Row 62 to 79 of 88
 Command ===>                                              Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=PDSHELP  ----------------------------
 >DIRENTRY PDSHELP
 PDS143I PDSHELP DIRECTORY ENTRY, LENGTH=52
          0000  D7C4E2C8 C5D3D740  00010514 01002048  *PDSHELP ........*
          0010  0110079F 0110079F  12241FBC 1FBC0000  *................*
          0020  E2C8C1D9 C1F2F940  00001FBC 00001FBC  *SHARA29 ........*
          0030  00000000                              *....*

 PDS262I LOC NAME     VALUE     DESCRIPTION
 PDS262I --- ----     -----     -----------
 PDS262I 00  PDS2NAME PDSHELP   MEMBER NAME
 PDS262I 08  PDS2TTRP 000105    TTR OF FIRST BLOCK OF DATA
 PDS262I 0B  PDS2INDC 14        0 TTRS FOLLOW; 20 HALFWORDS OF DATA
 PDS262I 0C  DIRSPFV  1.        MEMBER VERSION NUMBER
 PDS262I 0D  DIRSPFR  0.        MEMBER REVISION NUMBER
 PDS262I 0E  DIRSPFFL 20        EXTENDED STATS -- X'20'  SCLM -- X'80'
 PDS262I 0F  DIRSPFCS 48        LAST CHANGE TIME -- FORMAT: SS
 PDS262I 10  DIRSPFCR 0110079F  CREATION DATE    -- FORMAT: 0CYYDDDF
 PDS262I 14  DIRSPFCD 0110079F  LAST CHANGE DATE -- FORMAT: 0CYYDDDF
```

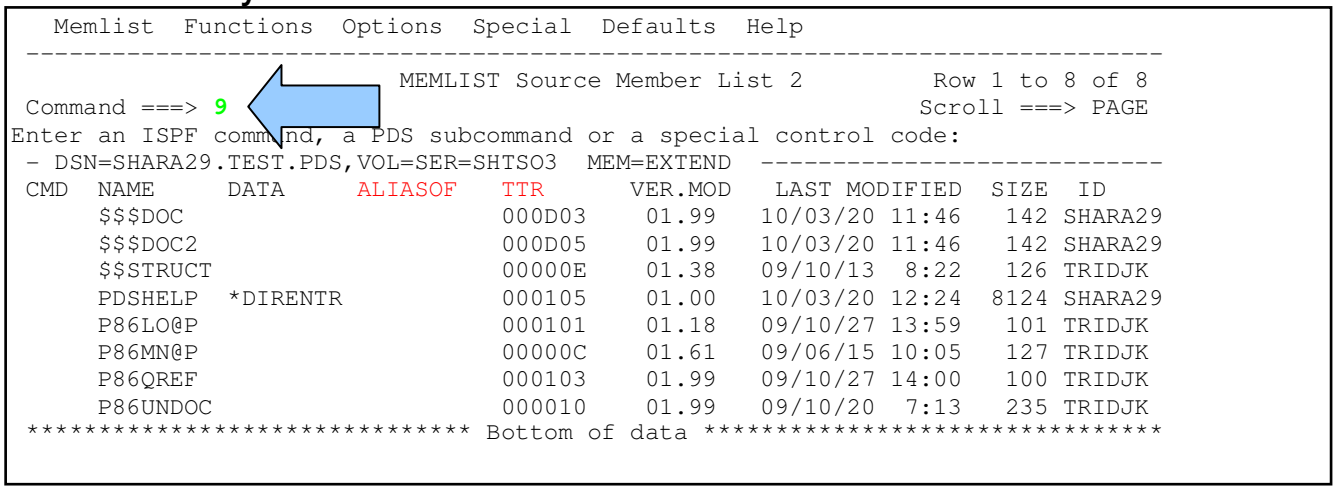


- Swap to the second MEMLIST panel display. To get to Member List 2, enter **ml;9** and press the Enter key.



```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                         ISPMODE Session Display 1     Row 113 to 130 of 139
 Command ===> ml;9                                      Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ----------------------------
 >DIRENTRY PDSHELP
 PDS143I PDSHELP DIRECTORY ENTRY, LENGTH=52
          0000  D7C4E2C8 C5D3D740  00010514 01002027  *PDSHELP ........*
          0010  0110079F 0110079F  14071FBC 1FBC0000  *................*
          0020  E2C8C1D9 C1F2F940  00001FBC 00001FBC  *SHARA29 ........*
          0030  00000000                              *....*

 PDS262I LOC NAME     VALUE     DESCRIPTION
 PDS262I --- ----     -----     -----------
 PDS262I 00  PDS2NAME PDSHELP   MEMBER NAME
 PDS262I 08  PDS2TTRP 000105    TTR OF FIRST BLOCK OF DATA
 PDS262I 0B  PDS2INDC 14        0 TTRS FOLLOW; 20 HALFWORDS OF DATA
 PDS262I 0C  DIRSPFV  1.        MEMBER VERSION NUMBER
 PDS262I 0D  DIRSPFR  0.        MEMBER REVISION NUMBER
 PDS262I 0E  DIRSPFFL 20        EXTENDED STATS -- X'20'  SCLM -- X'80'
 PDS262I 0F  DIRSPFCS 27        LAST CHANGE TIME -- FORMAT: SS
 PDS262I 10  DIRSPFCR 0110079F  CREATION DATE    -- FORMAT: 0CYYDDDF
 PDS262I 14  DIRSPFCD 0110079F  LAST CHANGE DATE -- FORMAT: 0CYYDDDF
```

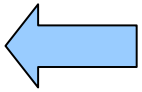
- And you get the results. ***ALIASOF*** and ***TTR*** are displayed on this panel.
- Swap to the third MEMLIST panel display. To get to Member List 3, enter **9** and press the Enter key.



```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 2         Row 1 to 8 of 8
 Command ===> 9                                               Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=EXTEND  ----------------------------
 CMD   NAME     DATA     ALIASOF    TTR      VER.MOD   LAST MODIFIED  SIZE  ID
      $$$DOC                        000D03    01.99   10/03/20 11:46   142 SHARA29
      $$$DOC2                       000D05    01.99   10/03/20 11:46   142 SHARA29
      $$STRUCT                      00000E    01.38   09/10/13  8:22   126 TRIDJK
      PDSHELP  *DIRENTR             000105    01.00   10/03/20 12:24  8124 SHARA29
      P86LO@P                       000101    01.18   09/10/27 13:59   101 TRIDJK
      P86MN@P                       00000C    01.61   09/06/15 10:05   127 TRIDJK
      P86QREF                       000103    01.99   09/10/27 14:00   100 TRIDJK
      P86UNDOC                      000010    01.99   09/10/20  7:13   235 TRIDJK
 ******************************** Bottom of data ********************************
```

- And you get the results. ***XSTAT*** is displayed on this panel.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                         MEMLIST Source Member List 3         Row 1 to 8 of 8
 Command ===>                                                Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=EXTEND  ----------------------------
 CMD  NAME     DATA     VER.MOD    CREATED       LAST MODIFIED  SIZE XSTAT ID
      $$$DOC             01.99  1997/11/24 2010/03/20 11:46:43   142      SHARA29
      $$$DOC2            01.99  1997/11/24 2010/03/20 11:46:43   142      SHARA29
      $$STRUCT           01.38  2006/05/30 2009/10/13  8:22:43   126      TRIDJK
      PDSHELP  *DIRENTR  01.00  2010/03/20 2010/03/20 12:24:48  8124  Y   SHARA29
      P86LO@P            01.18  1999/04/19 2009/10/27 13:59:22   101      TRIDJK
      P86MN@P            01.61  1998/03/27 2009/06/15 10:05:46   127      TRIDJK
      P86QREF            01.99  1997/04/15 2009/10/27 14:00:59   100      TRIDJK
      P86UNDOC           01.99  1997/04/15 2009/10/20  7:13:23   235      TRIDJK
 ******************************* Bottom of data ********************************
```



Lab Exercise 2

Objectives:

1. Sort on the Point To Shoot column headings
2. Find a member whose name contains QREF somewhere in the name
3. Exclude members from the display

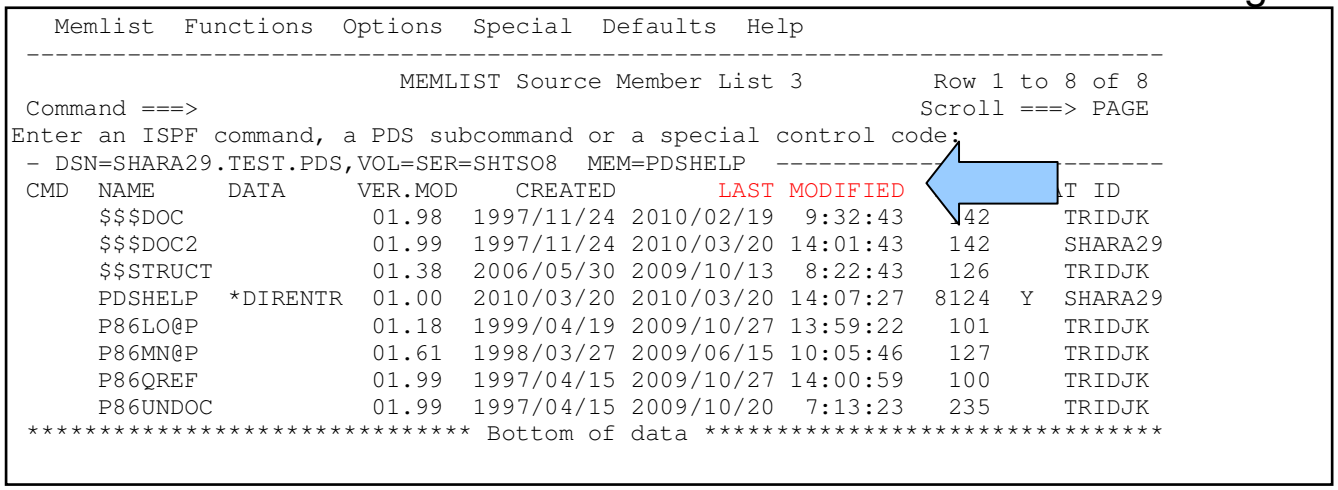
MEMLIST columns can be sorted in ascending or descending order. The columns are ISPF Point-To-Shoot fields (PTS), so you might be able to double click on the column header to sort by that column. Back-to-back double clicks will reverse the sort direction. If double clicking produces ***** ISPF screen input error - code = 32 *****, then position your cursor on the column header and press the Enter key or use the ISPF ***PSCOLOR*** primary command to change the default color of PTS fields from TURQ to WHITE.

The MEMLIST table display can be searched via the dialog "F" (Find) command.

All dialog table display lines can be excluded from display with the “X” exclude dialog command. “X ALL” will exclude all lines from display. “X ABOVE” will exclude all lines above the current line. “X BELOW” will exclude all lines below the current line. You can also exclude lines from display by using the X and XX line commands. Excluding table display lines does not destroy any member data or directory information.

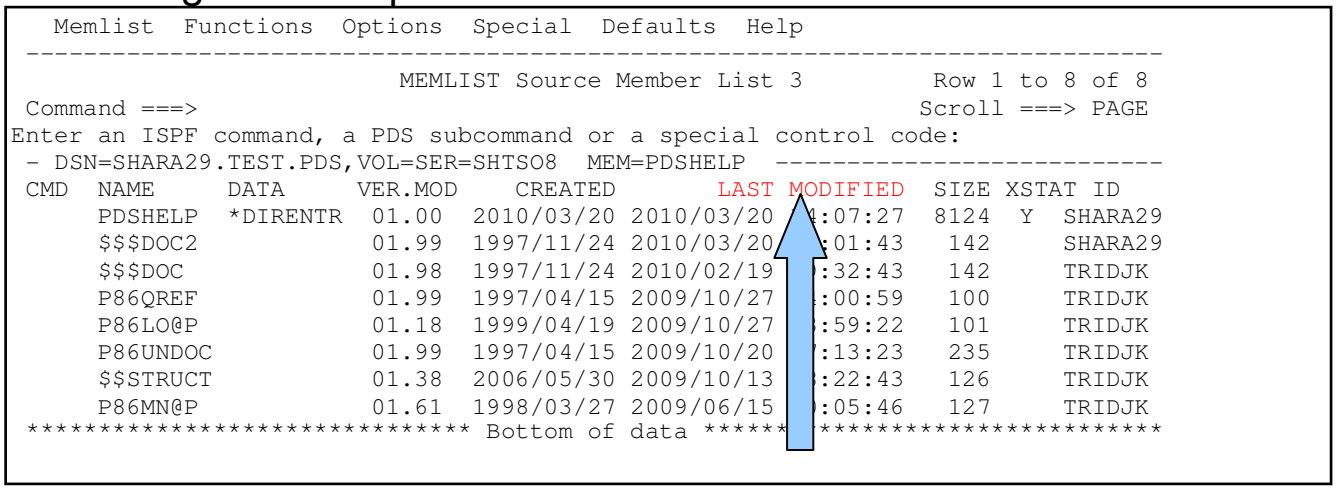
SORTING

- Double click on the ***LAST MODIFIED*** header to sort in descending timestamp order.



```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 3          Row 1 to 8 of 8
 Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ----------------------------
 CMD  NAME     DATA     VER.MOD    CREATED       LAST MODIFIED          SIZ  AT ID
      $$$DOC             01.98  1997/11/24 2010/02/19  9:32:43    142      TRIDJK
      $$$DOC2            01.99  1997/11/24 2010/03/20 14:01:43    142      SHARA29
      $$STRUCT           01.38  2006/05/30 2009/10/13  8:22:43    126      TRIDJK
      PDSHELP  *DIRENTR  01.00  2010/03/20 2010/03/20 14:07:27   8124  Y   SHARA29
      P86LO@P            01.18  1999/04/19 2009/10/27 13:59:22    101      TRIDJK
      P86MN@P            01.61  1998/03/27 2009/06/15 10:05:46    127      TRIDJK
      P86QREF            01.99  1997/04/15 2009/10/27 14:00:59    100      TRIDJK
      P86UNDOC           01.99  1997/04/15 2009/10/20  7:13:23    235      TRIDJK
 ****************************** Bottom of data ********************************
```

- And you get the results. Now double click on the ***LAST MODIFIED*** header to sort in ascending timestamp order.



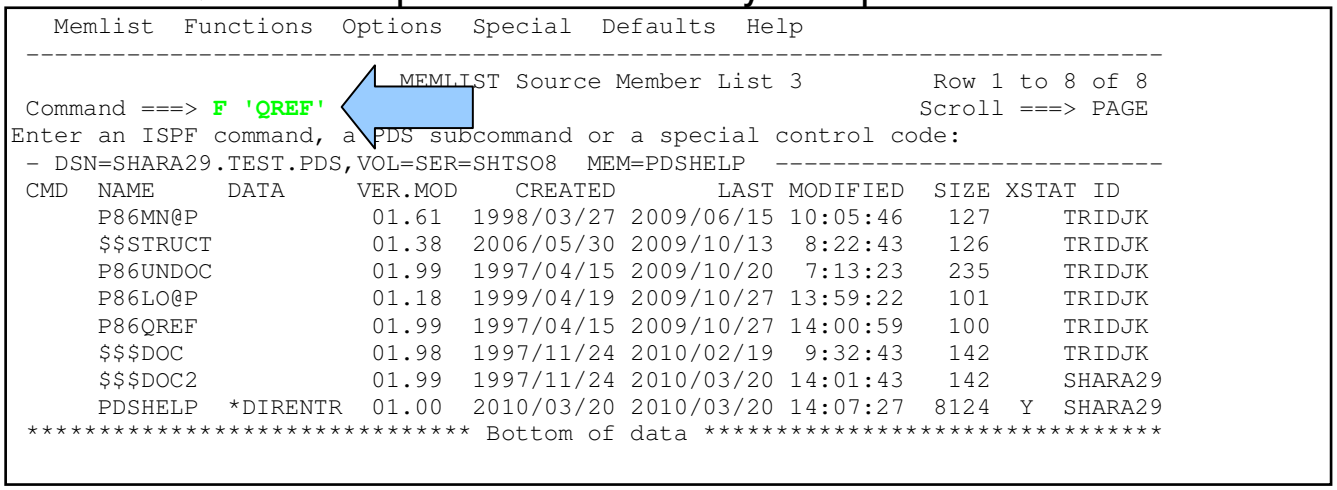
```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                         MEMLIST Source Member List 3          Row 1 to 8 of 8
Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ---------------------------
CMD  NAME     DATA     VER.MOD    CREATED       LAST MODIFIED  SIZE XSTAT ID
     PDSHELP  *DIRENTR  01.00  2010/03/20 2010/03/20 14:07:27  8124  Y  SHARA29
     $$$DOC2            01.99  1997/11/24 2010/03/20 14:01:43   142     SHARA29
     $$$DOC             01.98  1997/11/24 2010/02/19 13:32:43   142     TRIDJK
     P86QREF            01.99  1997/04/15 2009/10/27 13:00:59   100     TRIDJK
     P86LO@P            01.18  1999/04/19 2009/10/27 12:59:22   101     TRIDJK
     P86UNDOC           01.99  1997/04/15 2009/10/20 13:13:23   235     TRIDJK
     $$STRUCT           01.38  2006/05/30 2009/10/13 13:22:43   126     TRIDJK
     P86MN@P            01.61  1998/03/27 2009/06/15 13:05:46   127     TRIDJK
******************************* Bottom of data ********************************
```

- And you get the results.

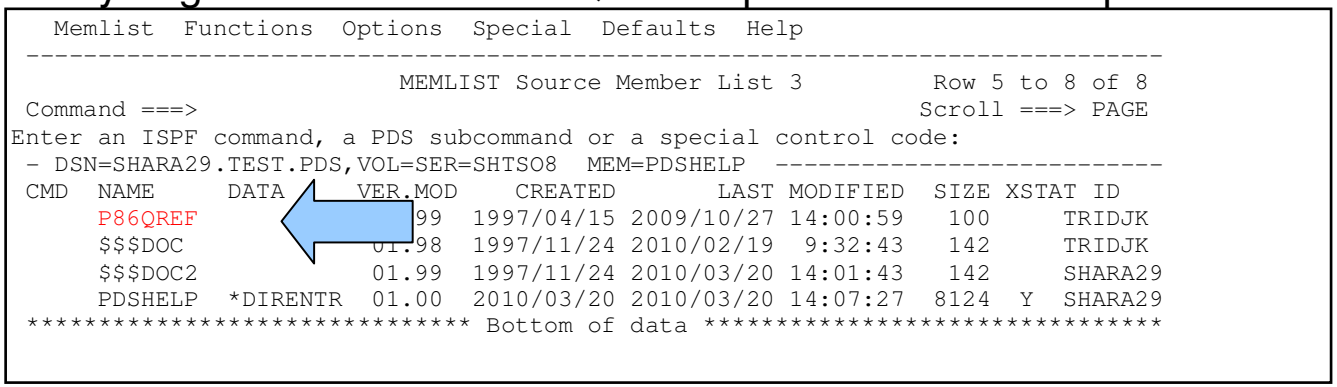
```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 3         Row 1 to 8 of 8
 Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ---------------------------
 CMD  NAME     DATA     VER.MOD    CREATED       LAST MODIFIED  SIZE XSTAT ID
      P86MN@P            01.61  1998/03/27 2009/06/15 1 05:46   127     TRIDJK
      $$STRUCT           01.38  2006/05/30 2009/10/13   22:43   126     TRIDJK
      P86UNDOC           01.99  1997/04/15 2009/10/20   13:23   235     TRIDJK
      P86LO@P            01.18  1999/04/19 2009/10/27 1 59:22   101     TRIDJK
      P86QREF            01.99  1997/04/15 2009/10/27 1 00:59   100     TRIDJK
      $$$DOC             01.98  1997/11/24 2010/02/19   32:43   142     TRIDJK
      $$$DOC2            01.99  1997/11/24 2010/03/20 1 01:43   142     SHARA29
      PDSHELP  *DIRENTR  01.00  2010/03/20 2010/03/20   07:27  8124  Y  SHARA29
 ******************************* Bottom of data ********************************
```

FIND

- Enter **F 'QREF'** and press the Enter key to reposition the member list display.



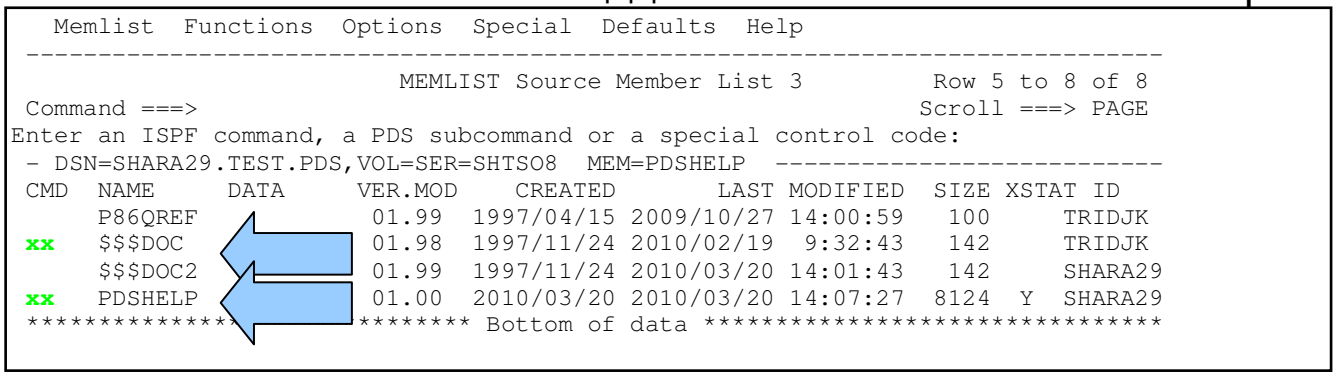
- And you get the results. P860QREF is positioned at the top of the member list.



```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 3         Row 5 to 8 of 8
 Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ----------------------------
 CMD  NAME      DATA       VER.MOD    CREATED       LAST MODIFIED  SIZE XSTAT ID
      P86QREF                  .99  1997/04/15 2009/10/27 14:00:59   100      TRIDJK
      $$$DOC                 01.98  1997/11/24 2010/02/19  9:32:43   142      TRIDJK
      $$$DOC2                01.99  1997/11/24 2010/03/20 14:01:43   142      SHARA29
      PDSHELP  *DIRENTR      01.00  2010/03/20 2010/03/20 14:07:27  8124  Y   SHARA29
 ******************************** Bottom of data ********************************
```

EXCLUDING

- Enter **XX** to the left of member $$$DOC and PDSHELP and then press the Enter key.



- And you get the results.

```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 3         Row 5 to 5 of 5
 Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=PDSHELP  ---------------------------
 CMD  NAME     DATA     VER.MOD    CREATED       LAST MODIFIED  SIZE XSTAT ID
      P86QREF            01.99  1997/04/15 2009/10/27 14:00:59   100     TRIDJK
 ******************************** Bottom of data ***********************
```

Lab Exercise 3

Objectives:

1. Exit ISPMODE
2. Get the All Member display
3. Specifying wildcard Member lists
4. Specifying pattern Member lists
5. Specifying range Member groups

MEMBER LISTS and MEMBER GROUPS

PDS subcommands which allow member name specifications generally allow use of a list of members, a group of members, or both (a list of group member names). After a member specification has been entered, that group is termed the "default group" and it may be represented by entering a single * **(asterisk)** in the member name position.

According to IBM standards, member names should begin with an alphabetic or national character and it may be followed with up to seven alphanumeric or national characters.

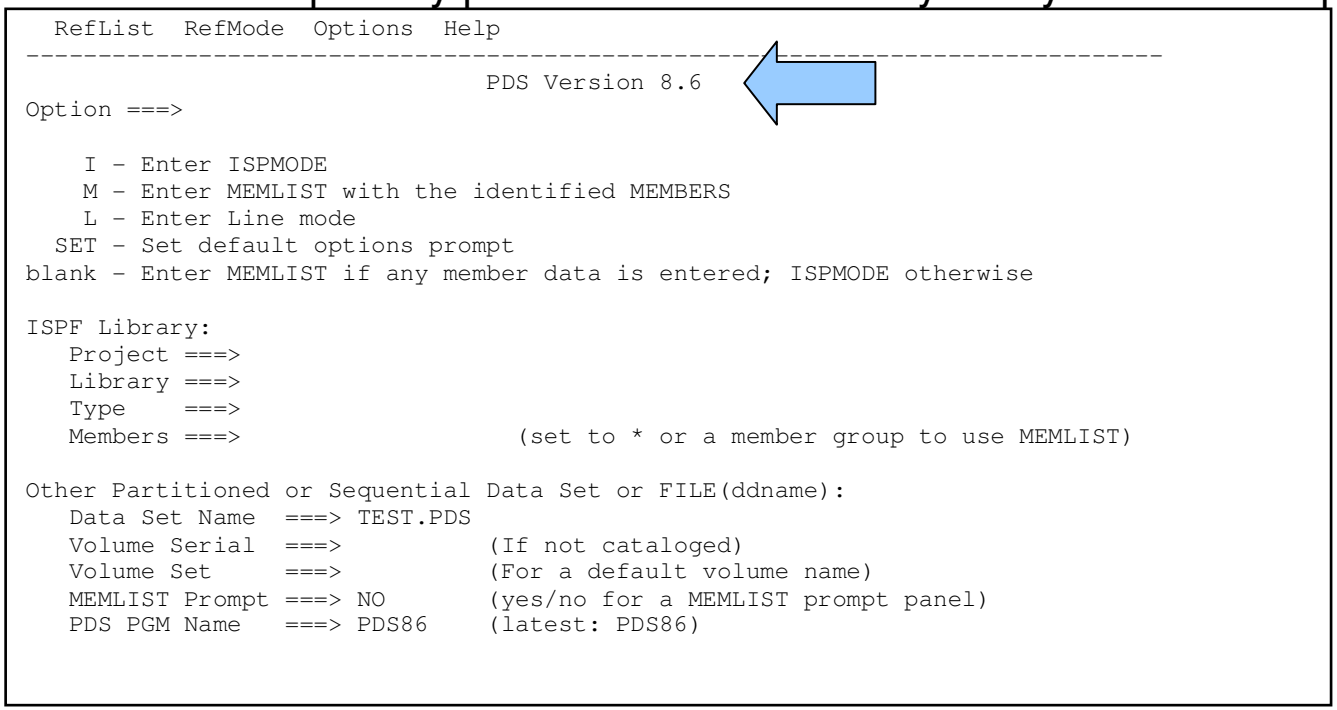
In actual fact, member names in a PDS directory may contain almost any data. You may specify member names with imbedded special characters (example: A<C?23) to PDS, but the use of some special characters such as parentheses, commas, blanks, semicolons, asterisks, colons or slashes may cause unexpected results.

For this reason, and to allow specification of unprintable member names, PDS allows you to enter hexadecimal member names. The normal ISPF convention for specifying hexadecimal values is used: x'**HH..nn**', where **HH** represents a valid hexadecimal value and **..nn** represents repeating multiple pairs can be specified.

WILDCARDS - If a member name contains a *** (asterisk)** somewhere in the name, it is assumed to represent one or more members from the data set whose member names are in the range of names represented by the data **before** the asterisk and matching the second name segment somewhere in the **remainder** of the member name. Note the following examples for a data set containing members named A, AD, A1, A2, BA, BADZ, B2, and Z299.

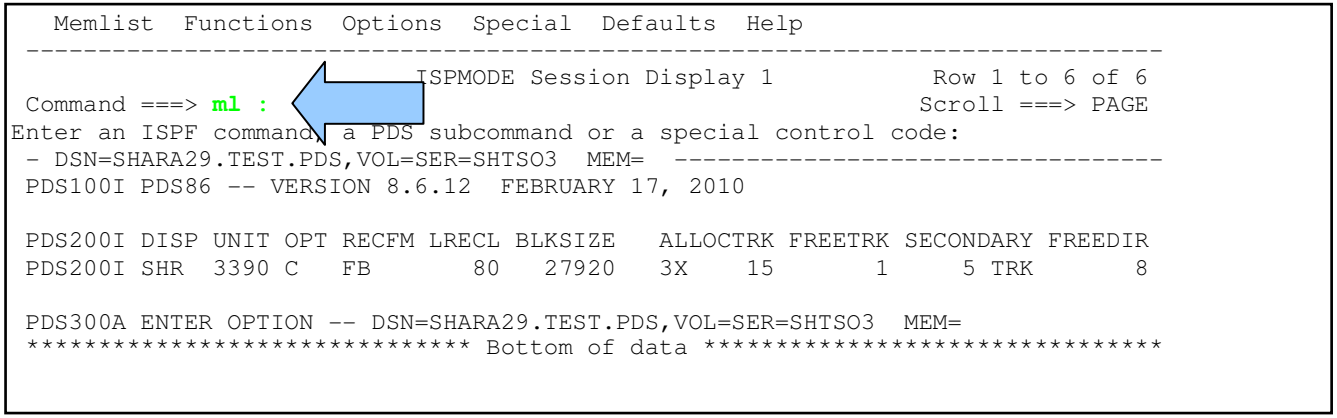
Command	Results
MEMBERS *	Matches the default member group
MEMBERS ba*	Matches members BA and BADZ
MEMBERS ba*z	Matches member BADZ
MEMBERS ba*d	Matches member BADZ
MEMBERS ba*a	No matches
MEMBERS a* MEMBERS x'c1'*	Matches members A, AD, A1, and A2
MEMBERS a2345678*b2345678	Error: IKJ56702I INVALID MEMBER NAME, A2345678*B2345678 IKJ56718A REENTER THIS OPERAND+ -
MEMBERS a234*b234	PDS713E NO MEMBER NAMES MATCH THIS COMBINATION NAME
MEMBERS *ad	Matches members AD and BADZ

- Get back to the primary panel. Press the PF3 key until you are at this panel.



```
  RefList  RefMode  Options  Help
-------------------------------------------------------------------------------
                               PDS Version 8.6
Option ===>

    I - Enter ISPMODE
    M - Enter MEMLIST with the identified MEMBERS
    L - Enter Line mode
  SET - Set default options prompt
blank - Enter MEMLIST if any member data is entered; ISPMODE otherwise

ISPF Library:
   Project ===>
   Library ===>
   Type    ===>
   Members ===>                   (set to * or a member group to use MEMLIST)

Other Partitioned or Sequential Data Set or FILE(ddname):
   Data Set Name  ===> TEST.PDS
   Volume Serial  ===>          (If not cataloged)
   Volume Set     ===>          (For a default volume name)
   MEMLIST Prompt ===> NO       (yes/no for a MEMLIST prompt panel)
   PDS PGM Name   ===> PDS86    (latest: PDS86)
```

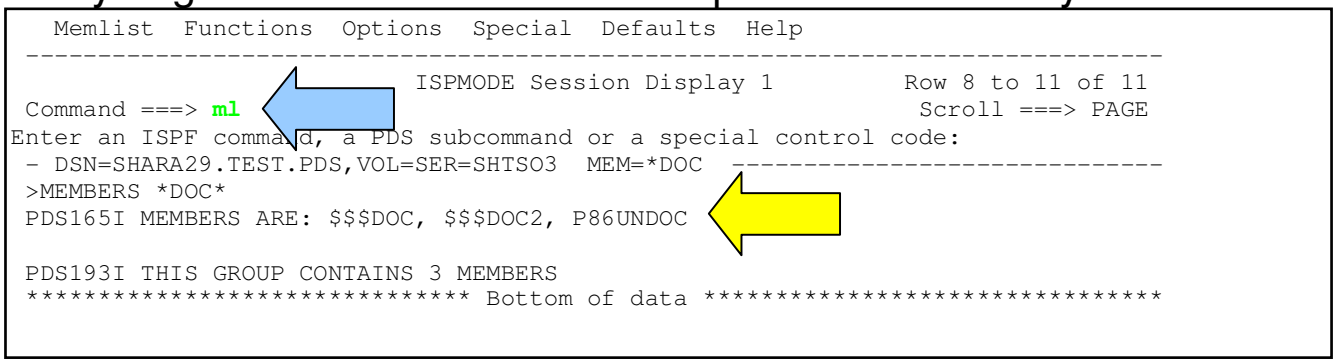
- Get back to an All Members list sorted by name. Enter **ML :** and press the Enter key or double click the ***Memlist*** action bar item and select ***1. All Members***.



- Filter down to just members with DOC in their name. Type **MEMBERS *DOC** and press the Enter key.

```
  Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                          MEMLIST Source Member List 1          Row 1 to 8 of 8
 Command ===> members *doc                                     Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO8  MEM=:
 CMD   NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
       $$$DOC             01.98    97/11/24  10/02/19  9:32   142    70   TRIDJK
       $$$DOC2            01.99    97/11/24  10/03/20 14:01   142    70   SHARA29
       $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
       PDSHELP            01.00    10/03/20  10/03/20 14:07  8124  8124   SHARA29
       P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
       P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
       P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
       P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ******************************* Bottom of data ********************************
```

- And you get the result. Enter **ML** and press the Enter key.



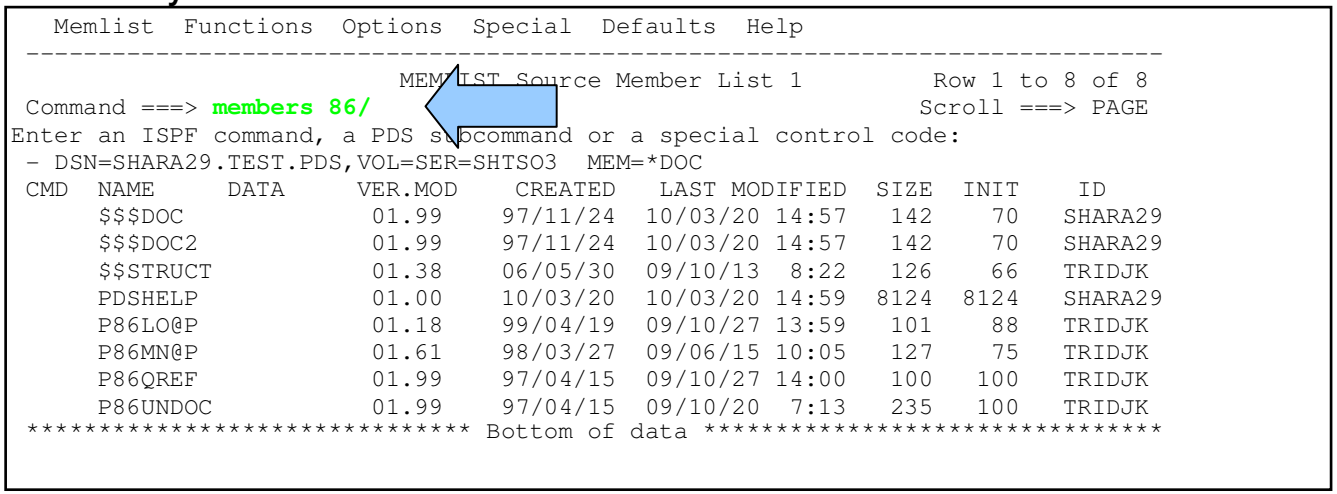
- And you get the result.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1         Row 1 to 8 of 8
 Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=*DOC
 CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC             01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$$DOC2            01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
      PDSHELP            01.00    10/03/20  10/03/20 14:59  8124  8124   SHARA29
      P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ****************************** Bottom of data ********************************
```

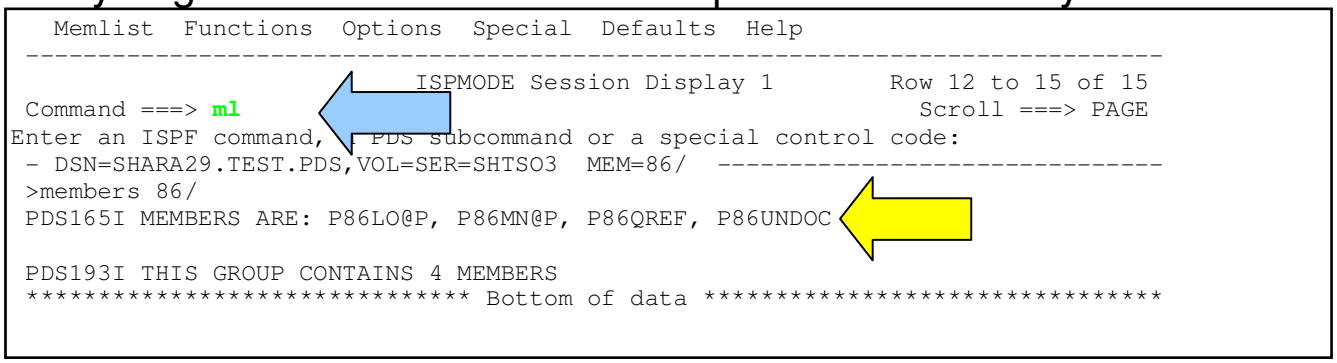
PATTERNS - If a member name contains a / **(slash)**, it is assumed to represent one or more members from the data set which contain the **pattern** segments in their member names. Note the following examples for a data set containing members named A, AD, A1, A2, BA, BADZ, B2, and Z299.

Command	Results
MEMBERS /	Error IKJ56702I INVALID MEMBER NAME, / IKJ56718A REENTER THIS OPERAND+ -
MEMBERS a/	Matches members A, AD, A1, A2, BA, and BADZ
MEMBERS /ba	Matches members BA and BADZ
MEMBERS ba/	Matches members BA and BADZ
MEMBERS ad/ MEMBERS x'c1c4'/	Matches members AD and BADZ
MEMBERS ad/ba	Matches member BADZ
MEMBERS a2345678/b2345678	PDS712E NO MEMBER NAMES MATCH THIS PATTERN
MEMBERS 99/z2 MEMBERS z299/	Matches member Z299
MEMBERS 2/	Matches members A2, B2, and Z2999

- Filter down to just members with ***86*** in their name. Type **MEMBERS 86**/ and press the Enter key.



- And you get the result. Enter **ML** and press the Enter key.



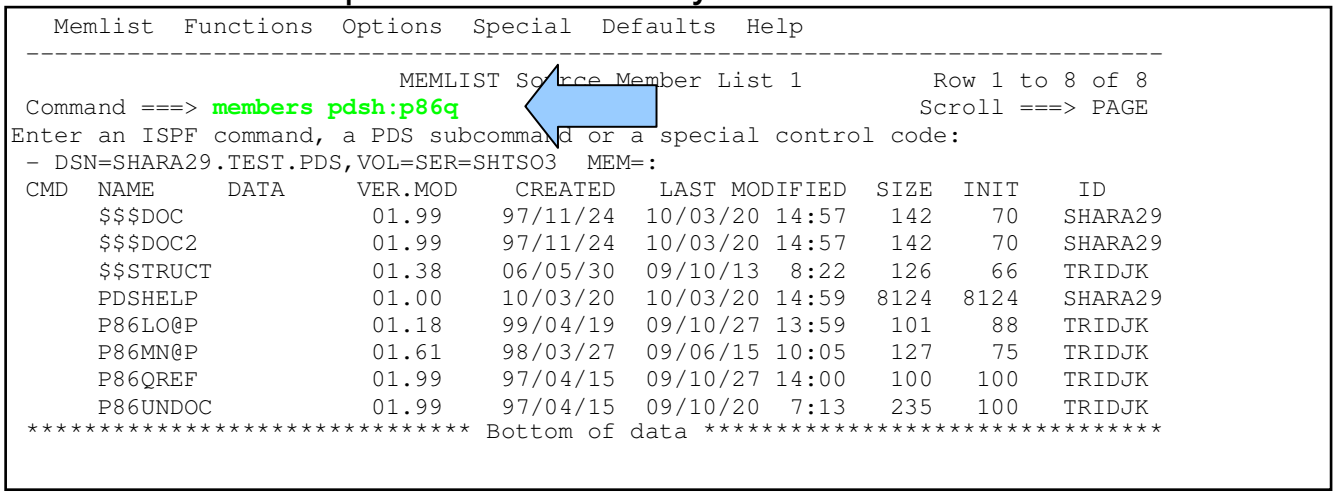
- And you get the result.

```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1         Row 1 to 8 of 8
 Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=86/
 CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC             01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$$DOC2            01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
      PDSHELP            01.00    10/03/20  10/03/20 14:59  8124  8124   SHARA29
      P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ****************************** Bottom of data ********************************
```

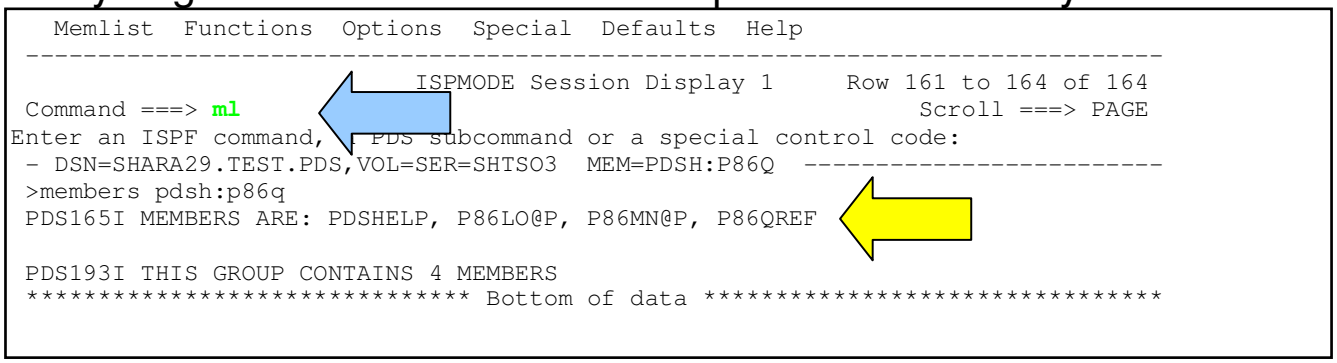
RANGES - If a member name contains a **: (colon)**, it is assumed to represent one or more members from the data set whose member names are in that **range** of names. Note the following examples for a data set containing members named A, AD, A1, A2, BA, BADZ, B2 and Z299.

Command	Results
MEMBERS :	Matches all members
MEMBERS :ba	Matches members A, AD, A1, A2, BA, and BADZ
MEMBERS ba:	Matches members BA, BADZ, B2, and Z2999
MEMBERS a0:bc	Matches member BADZ
MEMBERS bc:a0	PDS700E THIS RANGE OF NAMES IS INVALID
MEMBERS ba:bad MEMBERS x'c2c1':bad	Matches members BA and BADZ
MEMBERS bb:bb	PDS711E NO MEMBER NAMES ARE IN THIS RANGE
MEMBERS a2345678:b2345678	Matches members BA, BADZ, and B2

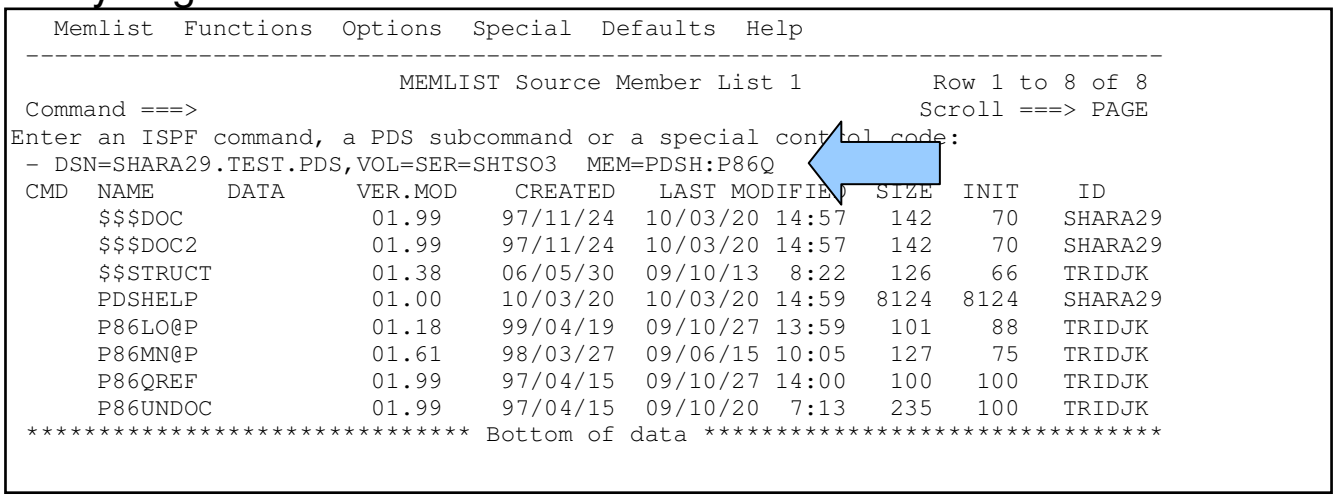
- Filter down to just members between PDSHELP and P86QREF. Type **MEMBERS PDSH:P86Q** and press the Enter key.



- And you get the result. Enter **ML** and press the Enter key.



- And you get the result.



```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1         Row 1 to 8 of 8
Command ===>                                                  Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=PDSH:P86Q
 CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
      $$$DOC             01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$$DOC2            01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
      $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
      PDSHELP            01.00    10/03/20  10/03/20 14:59  8124  8124   SHARA29
      P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
      P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
      P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
      P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
 ****************************** Bottom of data ********************************
```

Lab Exercise 4

Objectives:

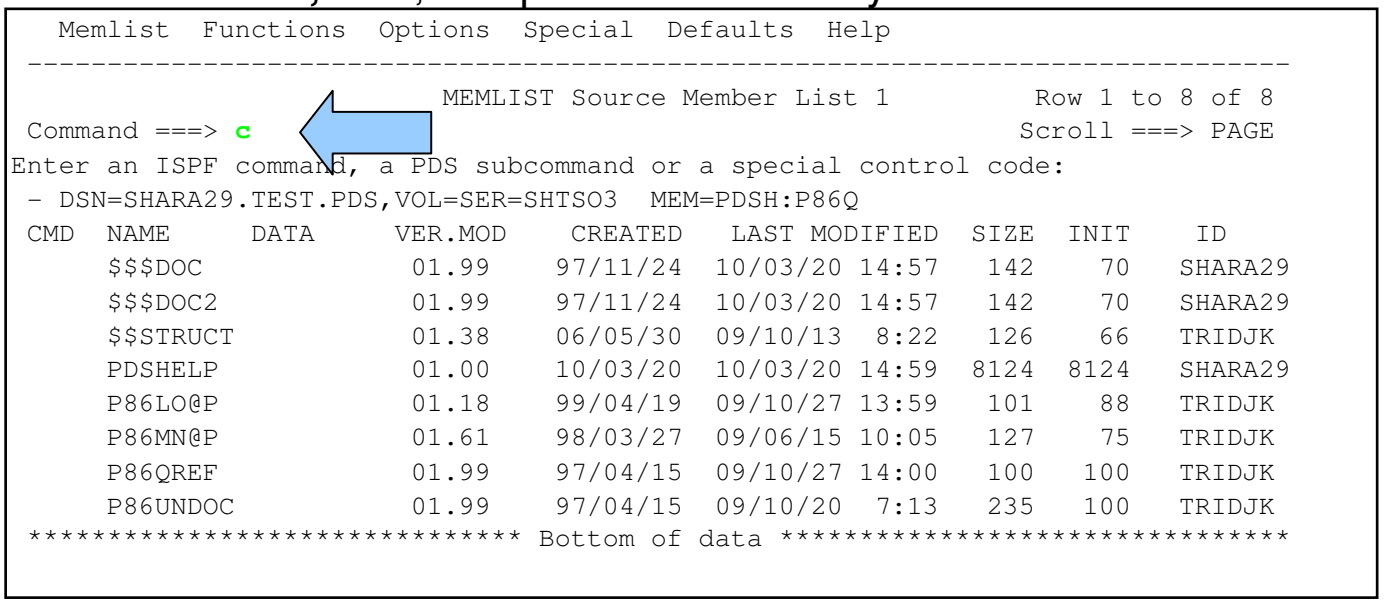
1. Change the current dataset
2. Sublist members that contain strings
3. Show the member list

FILTERING - The SUBLIST subcommand forms a member group. The member group also becomes the "default group" and it may be represented by entering a single * in the member name position.

Create a member group which:

a) Only contains members created before a year ago.
b) Has members containing the strings "IKJ" and "TSO" in their data.
c) Consists of members having only 100-200 records.
d) Contains every member in the PDS with "doc" somewhere in its name.

- Enter **CHANGE,** or **C**, and press the Enter key.

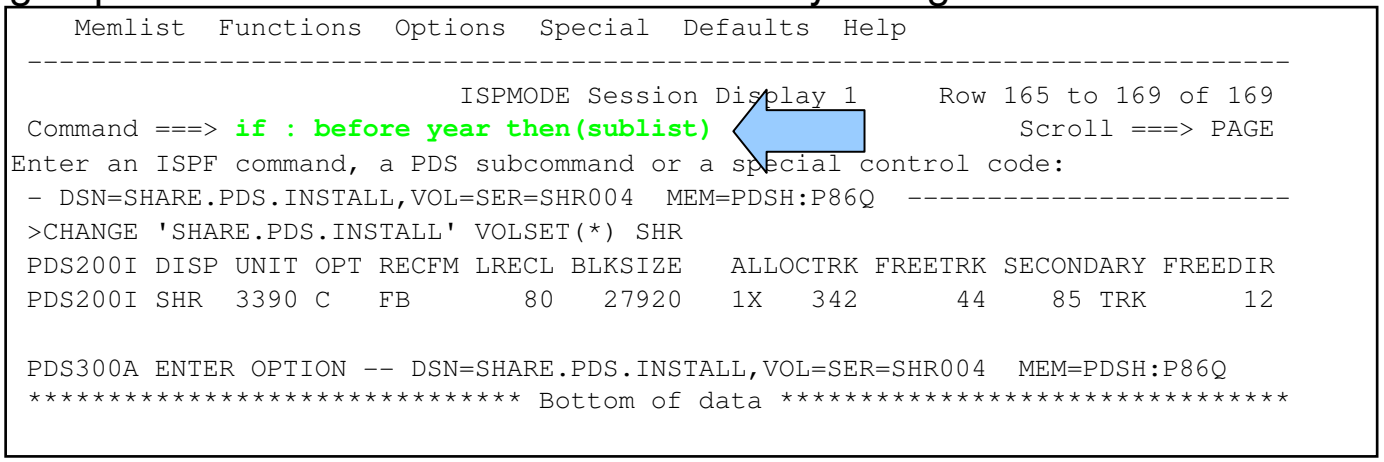


```
  Memlist  Functions  Options  Special  Defaults  Help
-------------------------------------------------------------------------------
                          MEMLIST Source Member List 1         Row 1 to 8 of 8
Command ===> c                                                Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=PDSH:P86Q
CMD  NAME     DATA     VER.MOD    CREATED   LAST MODIFIED  SIZE  INIT    ID
     $$$DOC             01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
     $$$DOC2            01.99    97/11/24  10/03/20 14:57   142    70   SHARA29
     $$STRUCT           01.38    06/05/30  09/10/13  8:22   126    66   TRIDJK
     PDSHELP            01.00    10/03/20  10/03/20 14:59  8124  8124   SHARA29
     P86LO@P            01.18    99/04/19  09/10/27 13:59   101    88   TRIDJK
     P86MN@P            01.61    98/03/27  09/06/15 10:05   127    75   TRIDJK
     P86QREF            01.99    97/04/15  09/10/27 14:00   100   100   TRIDJK
     P86UNDOC           01.99    97/04/15  09/10/20  7:13   235   100   TRIDJK
******************************* Bottom of data ********************************
```

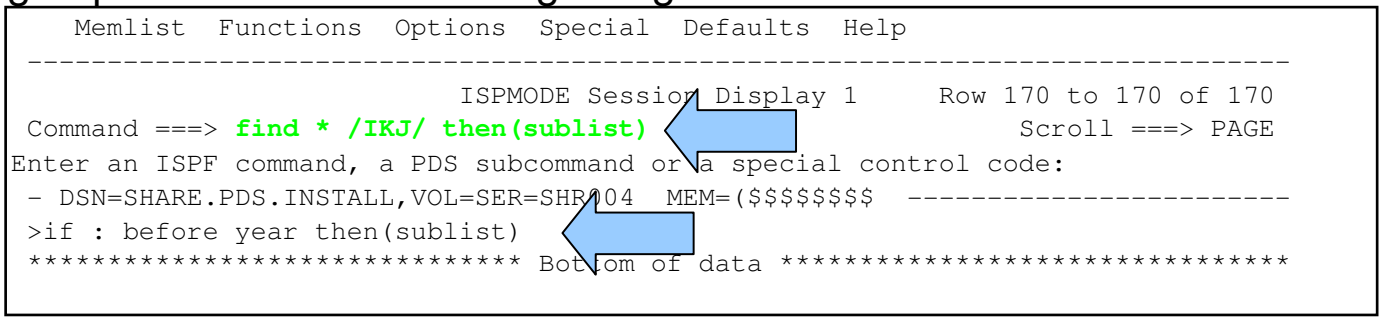
- Change the DATA SET NAME to **'SHARE.PDS.INSTALL'**.

```
------------------------- O.C    CHANGE Option Panel ------------------------
OPTION ===>

ISPF LIBRARY:
   PROJECT ===>
   LIBRARY ===>
   TYPE    ===>

Other partitioned or sequential data set or FILE(ddname):
   DATA SET NAME  ===> 'share.pds.install'
   VOLUME SERIAL  ===>          (If not cataloged)
   VOLUME SET     ===>          (For a default volume name)
   DISPOSITION    ===> SHR      (SHR or OLD)

   MEMLIST PROMPT ===> NO       (Yes/No for a MEMLIST prompt panel)
```

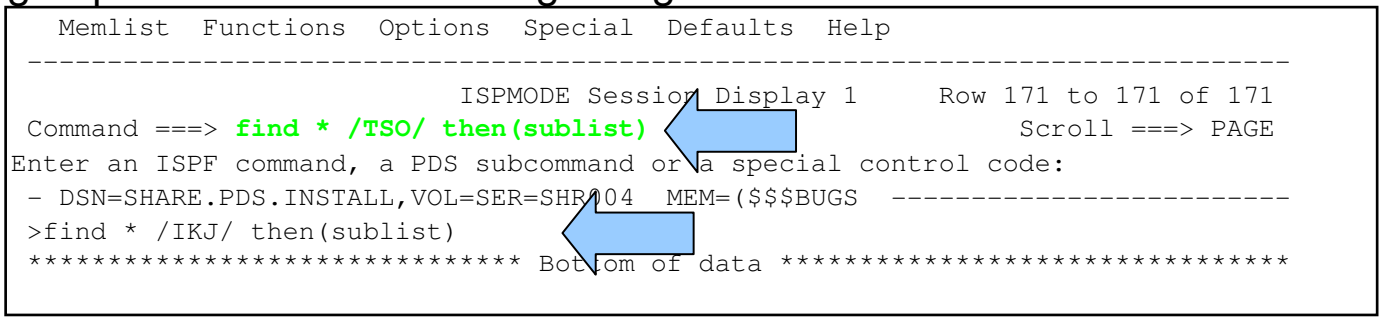
- Enter **if : before year then(sublist)** and press the Enter key. This filters the current group to members created more than one year ago.



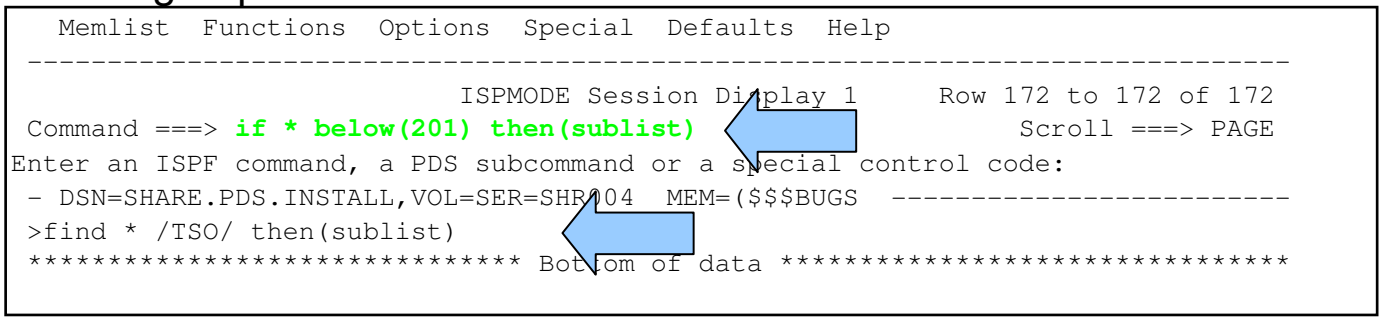
- Enter **find * /IKJ/ then(sublist)** and press the Enter key. This further filters the current group to members containing string "IKJ".



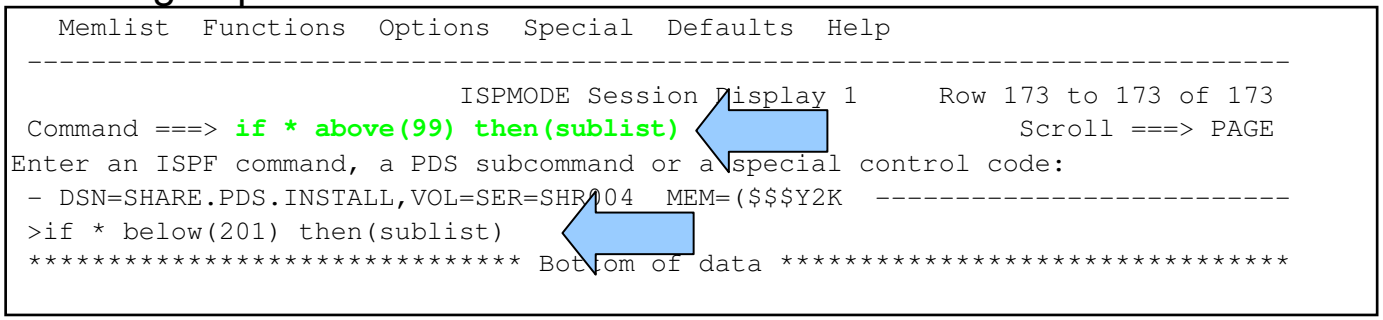
- Enter **find * /TSO/ then(sublist)** and press the Enter key. This further filters the current group to members containing string "TSO".



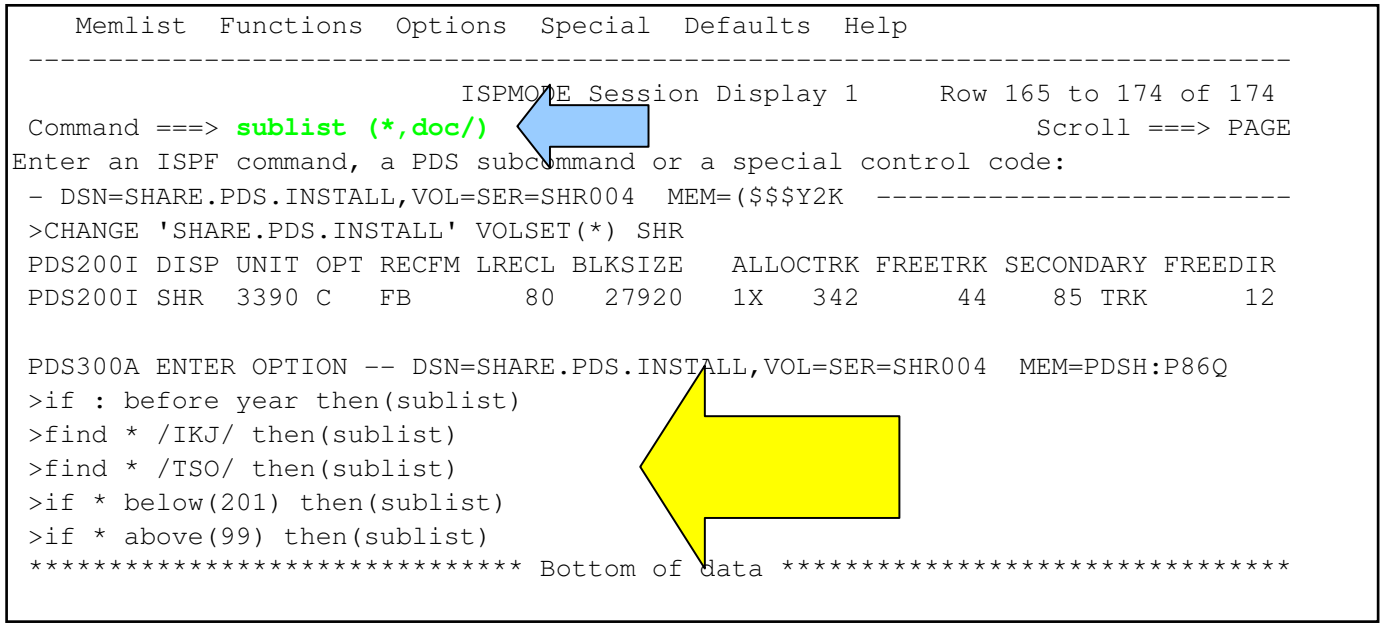
- Enter **if * below(201) then(sublist)** and press the Enter key. This further filters the current group to members with fewer than 201 records.



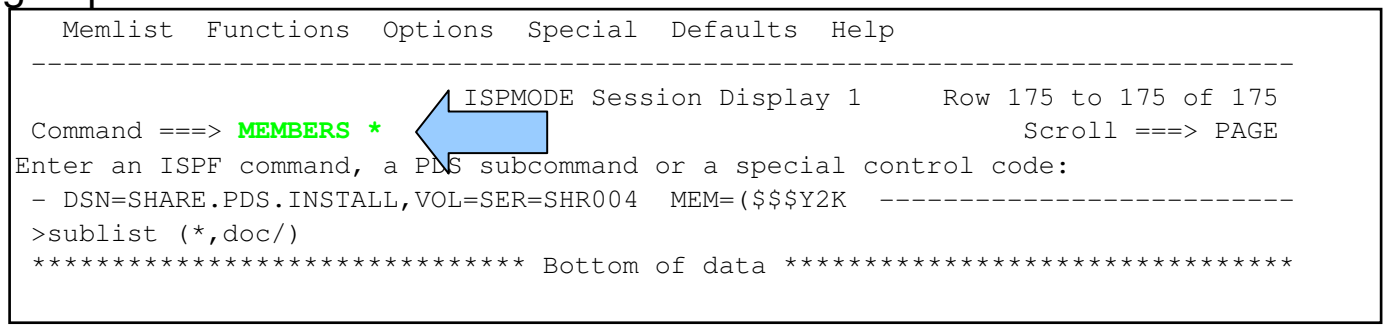
- Enter **if * above(99) then(sublist)** and press the Enter key. This further filters the current group to members with more than 99 records.



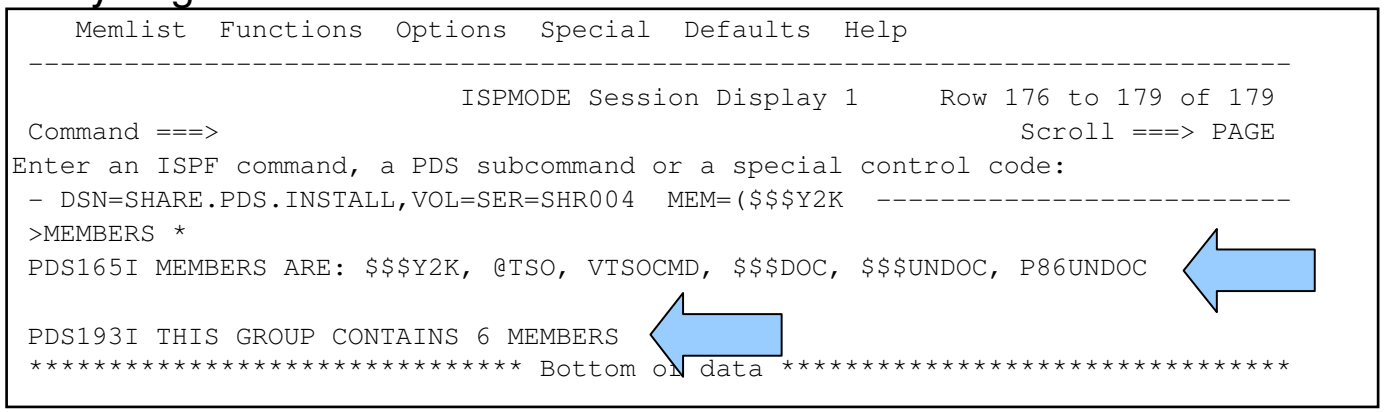
- Enter **H** and then press PF7 to scroll half a display up.
- Enter **sublist (*,doc/)** and press the Enter key. Notice there is a space between sublist and the left parenthesis. This sets the current member group to the list of members that matched the previous filtering and adds any members whose name contains DOC somewhere in the name.



- Enter **MEMBERS** * and press the Enter key to see the list of members in the current group.



- And you get the result.



Lab Exercise 5

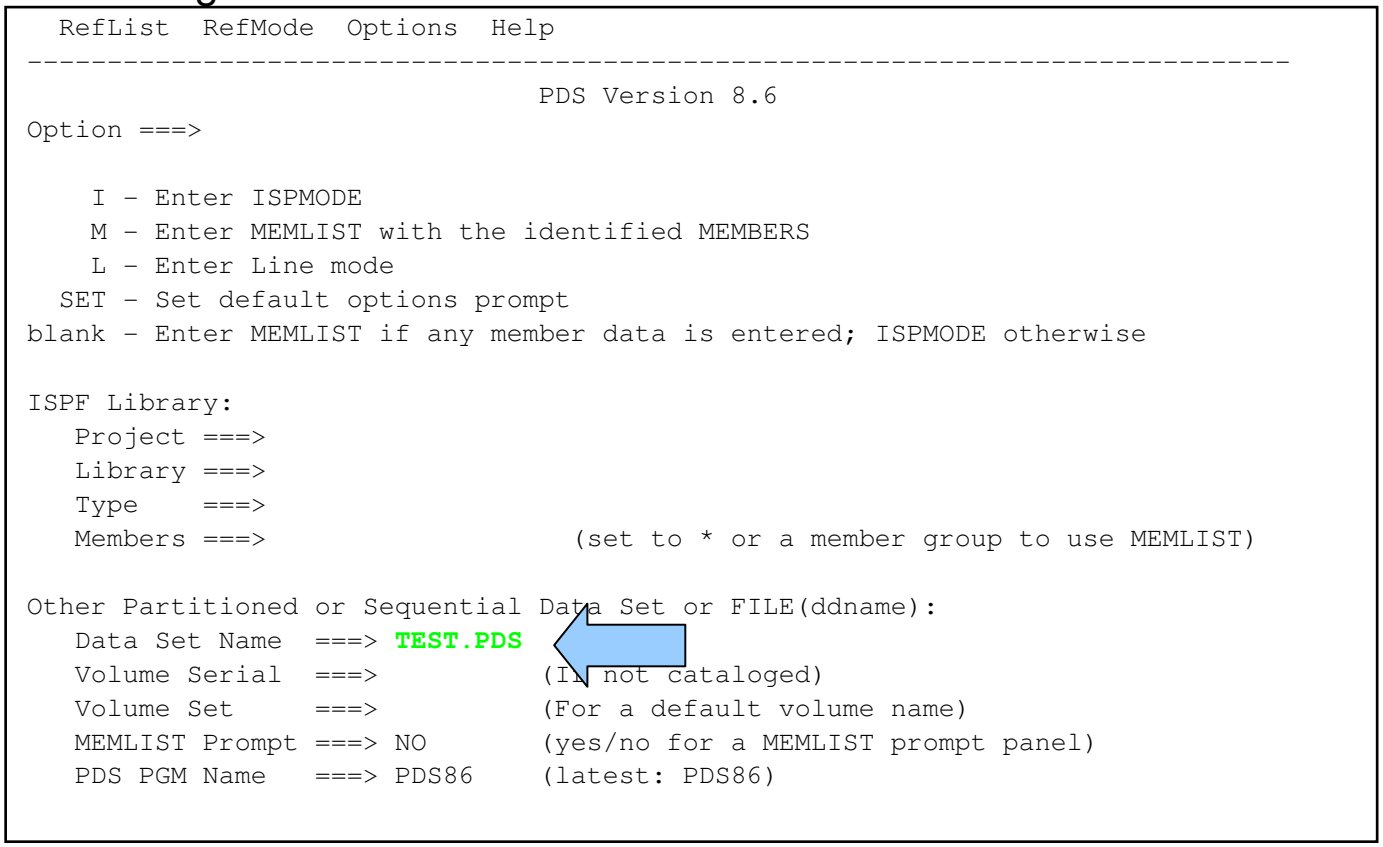
Objectives:

1. Change the current dataset back to your PDS
2. Change the BLKSIZE to simulate someone having coded a wrong DCB in JCL when writing to a PDS
3. Verify if any members are broken
4. Correct the BLKSIZE to the largest value reported

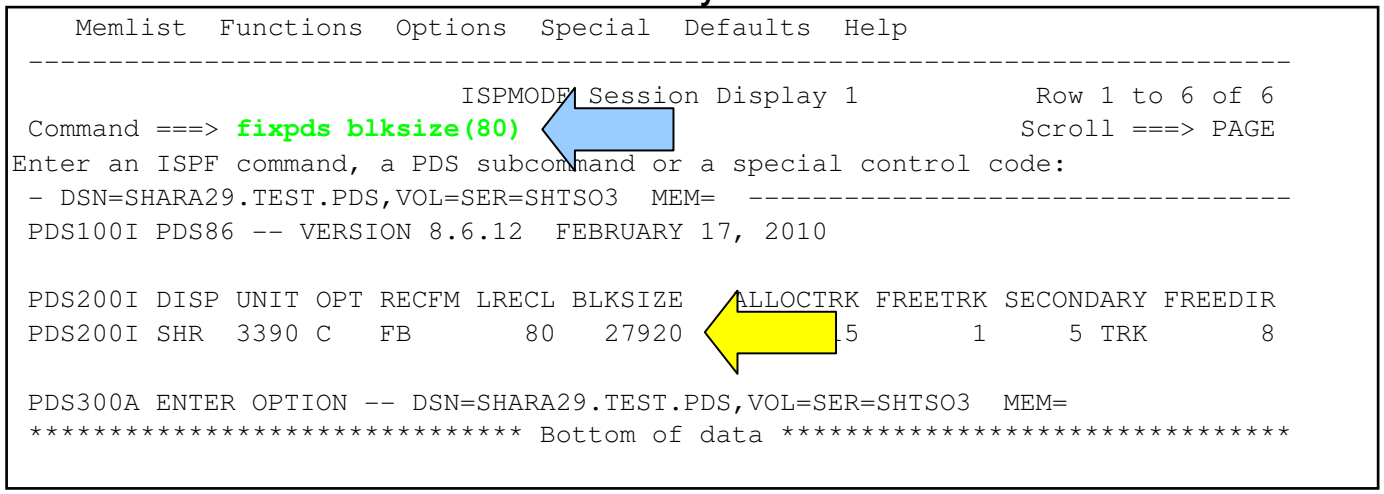
The FIXPDS subcommand is a powerful tool which can be used to do several tasks, such as:

1. Expand the directory
2. Reset the directory and the data set
3. Initialize the directory
4. Modify the DCB attributes
5. Mark all allocated space in use
6. Add one secondary extent

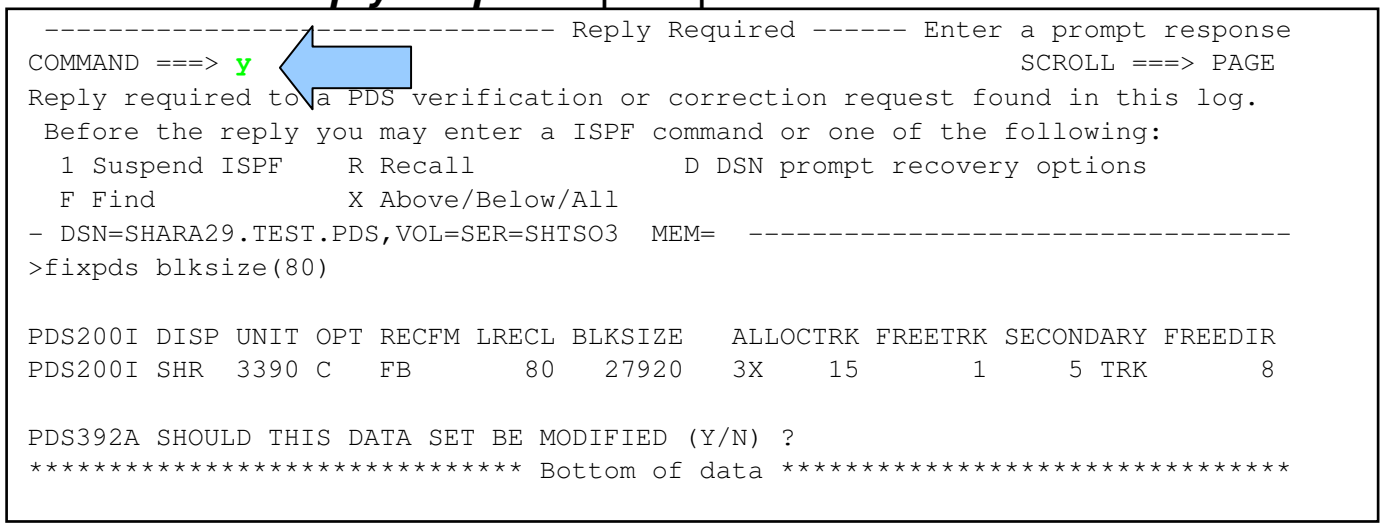
- Change back to your TEST.PDS data set press the Enter key. Exit ISPMODE and come in again or use the CHANGE command.



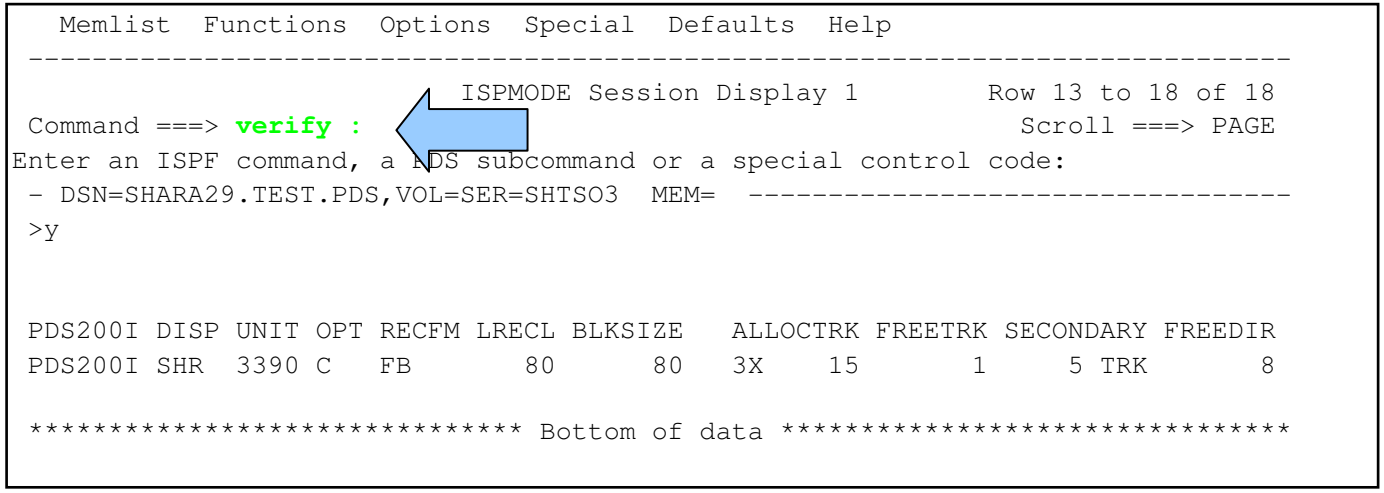
- Enter **fixpds blksize(80)** and press the Enter key to temporarily change the block size. Write down the current block size so you can correct it later.



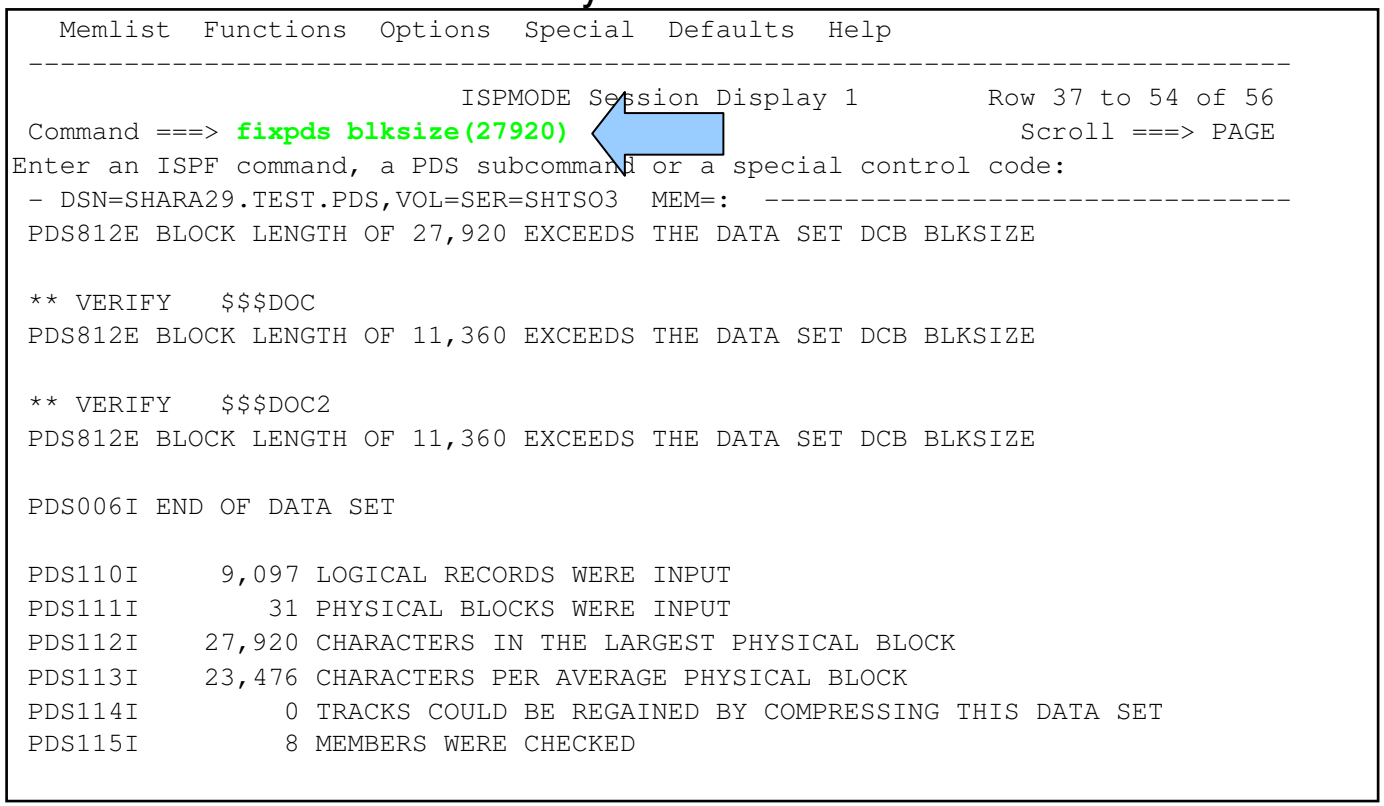
- Enter **Y** to the ***Reply Required*** prompt.



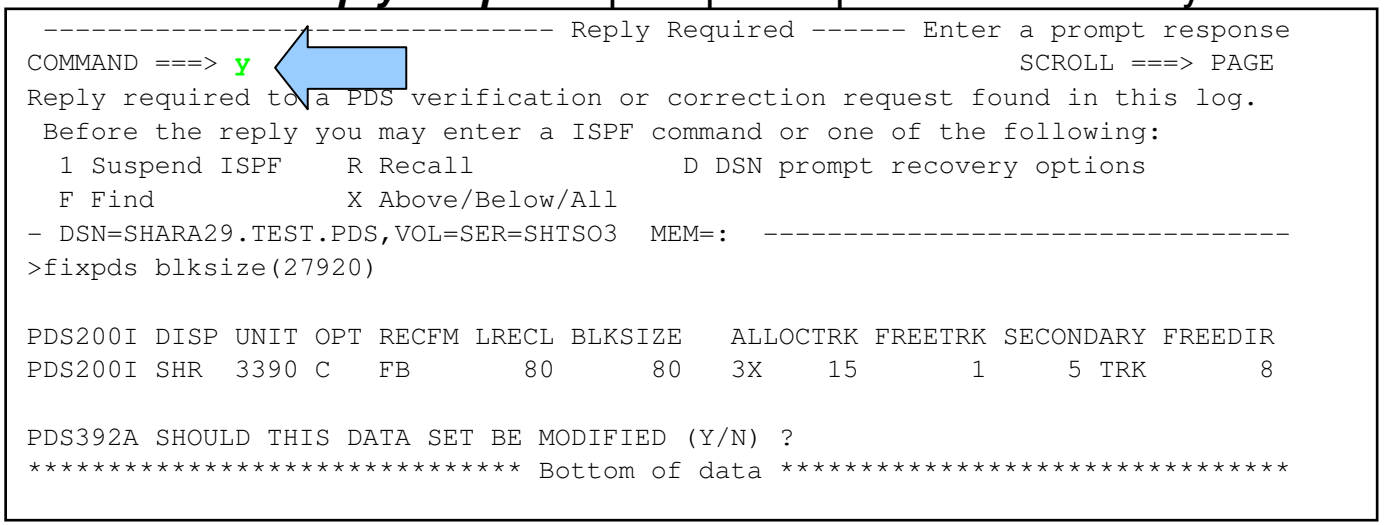
- And you get the results. Now enter **VERIFY :** and press the Enter key to see if you fixed it or made it worse.



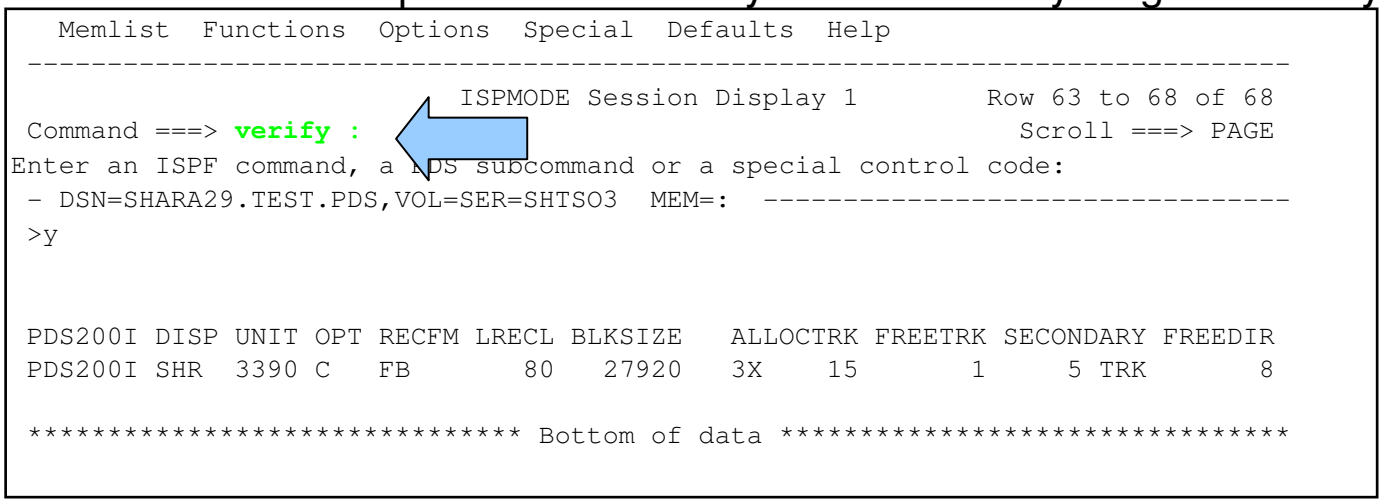
- And you get the results. You made it worse. Scroll down using PF8. Enter a command similar to **FIXPDS BLKSIZE(27920)** to change the block size to the largest value you saw. Use the actual block size you wrote down earlier.



- Enter **Y** to the ***Reply Required*** prompt and press the Enter key.



- Enter **VERIFY :** and press the Enter key to ensure everything is still okay.



- And you get the results.

```
   Memlist  Functions  Options  Special  Defaults  Help
 ------------------------------------------------------------------------------
                           ISPMODE Session Display 1        Row 69 to 82 of 82
 Command ===>                                                 Scroll ===> PAGE
Enter an ISPF command, a PDS subcommand or a special control code:
 - DSN=SHARA29.TEST.PDS,VOL=SER=SHTSO3  MEM=:  ---------------------------------
 >verify :

 PDS006I END OF DATA SET

 PDS110I     9,097 LOGICAL RECORDS WERE INPUT
 PDS111I        31 PHYSICAL BLOCKS WERE INPUT
 PDS112I    27,920 CHARACTERS IN THE LARGEST PHYSICAL BLOCK
 PDS113I    23,476 CHARACTERS PER AVERAGE PHYSICAL BLOCK
 PDS114I         0 TRACKS COULD BE REGAINED BY COMPRESSING THIS DATA SET
 PDS115I         8 MEMBERS WERE CHECKED


 PDS117I 8 MEMBERS COUNTED; CUMULATIVE SIZE IS 9,097 RECORDS

 ****************************** Bottom of data ********************************
```

Back at your shop

Objectives:

Continue learning the features of PDS so that **IF** a problem happens to a PDS you can quickly repair it.

QUICK INSTALL AND SETUP

In each line that shows **&your_hlq**, replace the variable with a high level qualifier you have access to.

Download the PDS install file from http://www.cbttape.org/ftp/cbt/CBT182.zip .

Extract the file.

Binary FTP the extracted file to MVS into a LRECL=80 sequential file called BIN.

TSO RECEIVE INDA(BIN) using the DA('&your_hlq.PDS.INSTALL') restore parameter.

Invoke ISPF 3.2 and allocate the following libraries:

Name	Tracks	Dirblks	Dsorg	Recfm	Lrecl	Blksz
&your_hlq.PDS.SPDSLLIB	60	10	PO	U	4096	32760
&your_hlq.PDS.SPDSMLIB	1	1	PO	FB	80	27920
&your_hlq.PDS.SPDSPLIB	75	65	PO	FB	80	27920

Run job PDSPJCL on &your_hlq.PDS.INSTALL to build the &your_hlq.PDS.SPDSPLIB and &your_hlq.PDS.SPDSMLIB panel and message libraries.

Run job PDSJCLHL to assemble and linkedit PDS86 into &your_hlq.PDS.SPDSLLIB.

Add these 2 clists to a library in your SYSPROC concatenation.

./ ADD NAME=PDSSETUP 0132-04127-09335-1203-00015-00004-00000-TRIDJK 32

```
PROC 0 INIT
CONTROL ASIS MSG NOCONLIST
WRITE Copy installation members to TEST.PDS
tsolib reset
tsolib activate dsn('&your_hlq.pds.spdsllib')
IF &INIT = &STR(INIT) THEN +
  DO
  END
ELSE +
  EXIT
delete test.pds
pds '&your_hlq.pds.install' xispmode +
    copy ($$$doc,$$struct,pdshelp,p86lo@p,p86mn@p,p86qref,p86undoc) +
    test.pds new track space(5,5) dir(10)
EXIT
```

./ ADD NAME=PDSLIBDF 0107-01058-09303-0851-00009-00009-00000-TRIDJK 23

```
PROC 0
CONTROL PROMPT
ISPEXEC LIBDEF ISPPLIB DATASET ID('&your_hlq.PDS.SPDSPLIB') STACK
ISPEXEC LIBDEF ISPMLIB DATASET ID('&your_hlq.PDS.SPDSMLIB') STACK
ISPEXEC LIBDEF ISPLLIB DATASET ID('&your_hlq.PDS.SPDSLLIB') STACK
ISPEXEC SELECT PANEL(PDS@PRIM) NEWAPPL(ISR) PASSLIB
ISPEXEC LIBDEF ISPPLIB
ISPEXEC LIBDEF ISPMLIB
ISPEXEC LIBDEF ISPLLIB
```

- LISTA provides a list of current allocations with their status and type as well as some dataset information. Invoke the LISTA (List Allocations) dialog function display. Enter **LISTA** and press the Enter key.
- Change to any load library type of data set. Enter **F SPDSLLIB** to search for the PDS load library.
- Enter the **o** line command in the CMD field to the left of the desired data set and press the Enter key to see the options available.
- Find if there are any authorized programs in this data set. Enter **if : auth then(sublist** and press the Enter key.
- List the attributes of the sublisted members. Enter **attrib *** and press the Enter key.

- LISTV provides a list of requested volumes and their status and type as well as space information.Invoke the LISTV (List Volumes) dialog function display. Enter **LISTV &volser_prefix** and press the Enter key. Where &volser_prefix is the beginning of some volsers you want to list.
- Double click on the "**TOTAL FREE**" column header to sort the table.

APPENDIX

PDS Subcommands that use external programs

PDS calls external programs for some of its subcommands. These programs are invoked via the TSO/E Service Facility Routine. The external programs must be found using the search order the system uses for programs.

Subcommand	Program	Function
COPY	IEBCOPY	copy selected members to another data set
COMPRESS	IEBCOPY	compress the data set
XMIT	XMIT	transmit members to a user or dataset with TSO TRANSMIT
AMBLIST	AMBLIST	list load module XREF and IDR information
OFFLOAD	OFFLOAD	offload members to a sequential data set
LOAD	PDSLOAD	load pds from an IEBUPDTE member stream
COBANAL	COBANAL	execute COBANAL load module analysis utility
LMA	EQALMA	execute the load module analysis data (Debug Tool)
DISASM	DISASM	disassemble a load module
DLINK	DELINKI	reconstruct object code for a load module
CPKMAP	FDRCPK	display track map for volume (FDR Compaktor)
MXIBAT	MXI	display system information with the MXI program
PTSEXP	GIMCPTS	expand sysmod compacted data to a seq file
SRCHFOR	ISRSUPC	list occurrences of a character string using ISPF's SearchFor

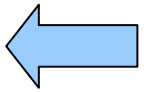
Running PDS in batch

PDS can be run in batch using the TSO Terminal Monitor Program (TMP). PDS runs in TSO line mode and all prompts are assumed to be 'YES'.

```
//*
//TSO4PDS EXEC PGM=IKJEFT01
//SYSTSPRT DD  SYSOUT=*
//SYSTSIN  DD  *
pds 'ad.file182.pds478'
sublist (p86loa, p86opa, p86opif, p86opifu, p86opml, p86opmlu, pdshelp)
replace * 'mm/dd/yy' 'yy/mm/dd' asis write
replace pdshelp '11/24/84:11/30/84' '84/11/24:84/11/30' asis write
replace pdshelp '1/1/85:3/15/85' '85/1/1:85/3/15' asis write
replace pdshelp '9/22/80 - date' '80/9/22 - date' asis write
replace pdshelp '6/14/84 - date' '84/6/14 - date' asis write
replace pdshelp ' 9/22/80' '80/9/22 ' asis write
replace pdshelp '11/22/81' '81/11/22' asis write
replace pdshelp ' 6/14/84' '84/6/14 ' asis write
replace pdshelp '11/29/81' '81/11/29' asis write
end
/*
//*
//
```

PDS Tutorial in ISPF dialog mode

- Double click ***Help*** from the Action Bar menu or position your cursor on ***Help*** and press the Enter key.



```
  RefList  RefMode  Options  Help
--------------------------------------------------------------------------------
                                PDS Version 8.6
Option ===>

    I - Enter ISPMODE
    M - Enter MEMLIST with the identified MEMBERS
    L - Enter Line mode
  SET - Set default options prompt
blank - Enter MEMLIST if any member data is entered; ISPMODE otherwise

ISPF Library:
   Project ===>
   Library ===>
   Type    ===>
   Members ===>                    (set to * or a member group to use MEMLIST)

Other Partitioned or Sequential Data Set or FILE(ddname):
   Data Set Name  ===> test.pds
   Volume Serial  ===>           (If not cataloged)
   Volume Set     ===>           (For a default volume name)
   MEMLIST Prompt ===> NO        (yes/no for a MEMLIST prompt panel)
   PDS PGM Name   ===> PDS86     (latest: PDS86)
```

Shortcuts for Power Users

TODAY	adds members updated today to the MEMLIST table
WEEK	adds members updated in the last week to the MEMLIST table
CREATE	invokes ISPF Data Set Utility (Option 3.2)
CHGM	CHANGE dataset menu
QR	displays PDS Quick Reference
STATUS	displays PDS Dialog Function Status menu
TRANS	displays the IBM product codes for compilers (CONTROL COMPILER)
CPU	displays hardware and software information (CONTROL LISTENV)
NEW	displays the most recent PDS modifications (CONTROL MODS)
ZMONTH	adds members zapped in the last month to the MEMLIST table
ZQUART	adds members zapped in the last quarter to the MEMLIST table
FN	displays the PDS Dialog Function Selection menu
SCRATCH	alias of the DELETE subcommand
SPFEDIT	alias of the EDIT subcommand
SEARCH	alias of the SRCHFOR subcommand
COMBINE	alias of the OFFLOAD subcommand
SEPARATE	alias of the LOAD subcommand
TIME	displays the current date and time
COLS	inserts a column line header into the ISPMODE Log
SET	displays the PDS Set Default Selection menu

TODAY	adds members updated today to the MEMLIST table
QUIT	terminate PDS
ST	line command for load modules (issues ATTRIB, MAP, and HISTORY)
/	line command for (O)ptions
?	line command for (O)ptions
=	short hand for SUBLIST = MEMLIST
*	short hand for MEMLIST *
KLEAR	clears screen in non-ISPMODE
C *	CHANGE to previous data set
SHOW n	switch to one of 9 ISPMODE Log tables (value 1 to 9)
FIXPDS	BLKSIZE(99999) operand will change block size to half-track
FIXPDS	STOWINIT operand will issue a STOW Initialize for a PDS
ATTRIB	APF/NOAPF operands are aliases for AUTH/NOAUTH
ATTRIB	ADDSTATS EXTEND operands will add extended ISPF statistics
ATTRIB	LONG operand will display ISPF size statistics in 99,999,999 format
CONTROL	GEO operand displays IBM DASD Geometry Chart
CONTROL	PDS operand displays PDS command assembly date

Tips on learning to use the PDS command

Read the TSO HELP member for the PDS command (install member PDSHELP).

Read the PDS Command Processor FAQ (install member $$$FAQ).

Select Help from the Action Bar menu.

Read “Effective Use of the PDS Command” by Bruce Leland located in the install member $$$PROSE.

Read “The PDS Program” by Sam Golob (install members $PDSART0-3).

Use your favorite search engine to see if someone already asked your question.

If you still have a question, ask questions on the IBM-MAIN listserv.

PDS Subcommand Quick Reference

Note: Highlighted subcommands are new in PDS 8.6

Subcommand	Function
Attrib	list or assign member attributes
ALias	assign an alias name to a member
AMblist	list load module XREF and IDR information
BLK3380	optimize 3380 disk utilization
BLK3390	optimize 3390 disk utilization
BLK9345	optimize 9345 disk utilization
Browse	browse a member using ISPF
CAX	list active system catalogs (ISPMODE only)
Change	select a different data set
COMpare	compare two members
COMPRess	compress the data set
CONtrol	list and set program parameters
CONDend	end PDS if warning or error messages (batch)
COPy	copy selected members to another data set
COBanal	list COBANAL load module analysis for module
CPkmap	display track map for volume (FDR Compaktor)
DCf	Document Composition Facility (script) format a dataset

Subcommand	Function
Display	list member names in the data set directory
DIRentry	list the directory entry for a member
DISasm	disassemble a load module
DELete	delete a member
DLink	reconstruct object code for a load module
DSAt	display data set attributes using TSO DSAT
DSName	list data set allocation statistics
DSPrint	print a member using the TSO DSPRINT command
DVol	display volume attributes and statistics using TSO DVOL
Edit	edit using ISPF
EDRec	invoke ISPF Edit recovery
END	terminate
EXec	invoke the CLIST processor (not operational in ISPMODE)
Find	list lines from a member containing a string
FIXpds	modify data set attributes
FSE	edit a member using FSE (a full screen editor)
FUnction	display the status of ISPMODE functions
Help	display PDS subcommand help using the TSO HELP command
HIstory	list the load module history data
IF	conditionally execute PDS subcommands
ISPF	invoke ISPF with an optional operand

Subcommand	Function
ISPMode	maintain a full screen session log
List	list a member
ListA	list TSO session allocations (ISPMODE only)
ListC	list datasets from a catalog or volume (ISPMODE only)
ListF	list datasets from a catalog or volume (ISPMODE only)
ListV	list disk volumes (ISPMODE only)
LMa	list Debug Tool Load Module Analysis info
LOad	load pds from an IEBUPDTE member stream
Map	list the load module structure
MEMbers	list member names in the current group
MEMList	maintain a full screen member list (ISPMODE only)
MXibat	display system information with the MXI program
OFfload	offload members to a sequential data set
OPtions	list all available subcommands
OUTcopy	output a member SELECT statement to FILE(PDSOUT)
Pattern	list member names containing a character pattern
PDs	select a different data set
PRintoff	print a member using the TSO PRINTOFF command
PTsexp	expand sysmod compacted data to a seq file
Recall	list or reenter the previous subcommand
REName	rename a member

Subcommand	Function
REPlace	update lines containing a character string
REPRo	reconstruct members or create members in this data set
REStore	resurrect a previously deleted member
REView	list a member using TSO REVIEW
SHow	select 1 of 9 session logs (ISPMODE only)
SMpgen	create SMP/E controls for source members
SRchfor	list occurrences of a character string with ISPF SearchFor
SUBmit	submit a JCL member to JES
SUBList	define a member list subgroup
TIme	list the current date and time
Tso	invoke a TSO command or CLIST
TSOEdit	edit a member using TSO EDIT
TSOList	list a member using TSO LIST
Usage	list data set statistics
View	view a member using ISPF
VErify	validate a member or the data set
VPsprint	list a member using TSO VPSPRINT
VToc	display data usage and statistics using TSO VTOC
XMit	transmit members to a user or dataset with TSO TRANSMIT
Zap	modify load modules using TSO ZAP

Congratulations, you have successfully completed the PDS Lab!