Computer Labs for the

Introduction to the New Mainframe: z/OS Basics course

These lab exercises will help you develop skills in using TSO, ISPF and the z/OS UNIX command shell. These skills are required for performing lab exercises in the remainder of this text. To perform the lab exercises, each student or team needs a TSO user ID and password (for assistance, see the instructor).

Logging on to z/OS and entering TSO commands

Establish a 3270 connection with z/OS using a workstation 3270 emulator and log on with your user ID (we will call this *yourid*). From the TSO READY prompt (after you have keyed in **=x** to exit out of ISPF into native TSO), enter the following commands:

PROFILE

What is the prefix value? Make a note of this; it is your user ID on the system.

PROFILE NOPREFIX

This changes your profile so TSO will not place a prefix at the beginning of your commands. Specifying PROFILE PREFIX (with a value) or NOPREFIX (by itself) tells the system whether to use a value (such as your user ID) to find files in the system. NOPREFIX tells the system not to bother limiting the results to files beginning with your user ID (for example) as it would otherwise do by default.

LISTC

The LISTCAT command (or LISTC, for short) lists the data sets in a particular catalog. Your 3270 emulator has a PA1 (attention) key. You can use the PA1 key to end the command output.

Note: When you see the three asterisks (***), it indicates that your screen is filled. Press Enter or PA to continue.

PROFILE PREFIX(userid)

This command specifies that your user ID is to be prefixed to all non-fully-qualified data set names. This will filter the results of the next command:

LISTC

What is displayed?

ISPF (or ISPPDF)

Enter into the ISPF menu-driven interface of TSO. **Note:** On some systems, you will also need to select option P to access the main ISPF screen.

Navigating through the ISPF menu options

From the ISPF Primary Option Menu, do the following:

1. Select **Utilities**, then select **Dslist** from the Utility Selection Panel.
2. Enter SYS1 on the Dsname Level input field and press Enter. What is displayed?
3. Use F8 to page down or forward, F7 to page up or backward, F10 to shift left and F11 to shift right. Exit with F3.
4. Enter SYS1.PROCLIB on the Dsname Level input field and press Enter. What is displayed?
5. Enter v in the command column to the left of SYS1.PROCLIB. This is a partitioned data set with numerous members. Place an s to the left of any member to select the member for viewing. Press F1. What specific help is provided?
6. Enter =0 on the ISPF command or option line. What is the first option listed in this ISPF Settings panel? Change your settings to place the command line at the bottom of the panel. It is effective on exit from the Settings panel.
7. Enter PFSHOW OFF and then PFSHOW ON. What is the difference? How is this useful?
8. Exit back to the ISPF Primary Option Menu. What value is used to select Utilities?
9. Select **Utilities**.
10. In the Utilities Selection Panel, what value is used to select Dslist? Exit back to the ISPF Primary Option Menu. On the option line, enter the Utilities selection value followed by a period, then enter the Dslist selection value. What panel is displayed?
11. Exit back to the ISPF Primary Option Menu. Place the cursor on the Status entry at the very top of the panel and press Enter. Select the Calendar value and press Enter, then select the Session value. What changed?
12. Now set your screen to the original configuration, using the Status pull-down and selecting **Session**.

Using the ISPF editor

From the ISPF Primary Option Menu, do the following:

1. Go to the DSLIST utility Panel and enter *yourid***.**JCL in the Dsname Level field. Press Enter.
2. Place e (edit) to the left of *yourid***.**JCL. Place s (select) to the left of member EDITTEST. Enter PROFILE on the edit command line, observe the data is preceded by profile and message lines. Read the profile settings and messages, then enter RESET on the command line. What is the result?

3. Enter any string of characters at the end of the first data line, then press Enter. On the command line, enter CAN (cancel). Press Enter to confirm the cancel request. Again, edit EDITTEST in the data set. Were your changes saved?
   Tip: As you become more familiar with ISPF, you will learn the letters and numbers for some of the commonly used options. Preceding an option with the = key takes you directly to that option, bypassing the menus in between.
   You can also go directly to nested options with the = sign. For example,
   =3.4 takes you directly to a commonly used data set utility menu.
4. Move the cursor to one of the top lines on your display. Press F2. The result is a second ISPF panel. What occurs when F9 is entered repeatedly?
5. Using F9, switch to the ISPF Primary Option Menu, then press F1 to display the ISPF Tutorial panel.
6. From the ISPF Tutorial panel, select **Edit**, then **Edit Line Commands**, then **Basic Commands**. Press Enter to scroll through the basic commands tutorial. As you do so, frequently switch (F9) to the edit session and exercise the commands in EDITTEST. Repeat this same scenario for Move/Copy commands and shifting commands.
7. From the ISPF Tutorial panel, select **Edit**, then **Edit Primary Commands**, then **FIND/CHANGE/EXCLUDE commands**. Press Enter to scroll through the FIND/CHANGE/EXCLUDE commands tutorial. As you do so, frequently switch (F9) to the edit session and exercise the commands in EDITTEST.
8. Enter =X on the ISPF help panel to end the second ISPF panel session. Save and exit the Edit Panel (F3) to return to the ISPF Primary Option Menu.

Using SDSF

From the ISPF Primary Option Menu, locate and select **System Display and Search Facility (SDSF)**, which is a utility that lets you look at output data sets. Select **More** to find the SDSF option (5), or simply enter =M.5. The ISPF Primary Option Menu typically includes more selections than those listed on the first panel, with instructions on how to display the additional selections.

1. Enter LOG, then shift left (F10), shift right (F11), page up (F7) and page down (F8). Enter TOP, then BOTTOM on the command input line. Enter DOWN 500 and UP 500 on the command input line. You will learn how to read this system log later.
2. Observe the SCROLL value to the far left on the command input line.
   Scroll ===> PAGE
   Tab to the SCROLL value. The values for SCROLL can be:

C or CSR	Scroll to where you placed the cursor
P or PAGE	Full page or screen
H or HALF	Half page or half screen

3. You will find the SCROLL value on many ISPF panels, including the editor. You can change this value by entering the first letter of the scroll mode over the first letter of the current value. Change the value to CSR, place the cursor on another line in the body of the system log, and press F7. Did it place the line with the cursor at the top?
4. Enter ST (status) on the SDSF command input line, then SET DISPLAY ON. Observe the values for Prefix, Best, Owner, and Susanne. To display all of the current values for each, enter * as a filter, for example:
   PREFIX *
   OWNER *
   DEST
   The result should be:
   PREFIX=* DEST=(ALL) OWNER=*
5. Enter DA, to display all active jobs. Enter ST to retrieve the status of all jobs in the input, active, and output queues. Once again, press F7 (page up), F8 (page down), F10 (shift left), and F11 (shift right).

To display the CPU configuration

1. Access SDSF from the ISPF primary option menu.
2. In the command input field, enter /D M=CPU and press Enter.
3. Use the ULOG option in SDSF to view the command display result.

To display the page data set usage

1. In the command input field, enter /D ASM and press Enter.
2. Press PF3 to return to the previous screens.

To display information about the current Initial Program Load (IPL)

1. Use ULOG option in SDSF to view the command display result.
2. In the command input field, enter /D IPLINFO and press Enter.

Opening the z/OS UNIX shell and entering commands

From the ISPF Primary Option Menu, select Option 6, then enter the OMVS command. From your home directory, enter the following shell commands:

id	Shows your current id.
date	Shows time and date.
man date	Manual of the **date** command. You can scroll through the panels by pressing Enter. Enter quit to exit the panels.
man man	Help for the manual.
env	Environment variables for this session.
type read	Identifies whether read is a command, a utility, an alias, and so forth.
ls	List a directory.
ls -l	List the current directory.
ls -l /etc.	List the directory /etc.
cal	Display a calender of the current month.
cal 2005	Display a calender of the year 2005.
cal 1752	13 days? [Answer: Yes, all UNIX calendars have 13 days missing from September 1752.] Optional: To find out why, ask a History major!
exit	End the OMVS session.

Using the OEDIT and OBROWSE commands

Another way to start the OMVS shell is by entering the TSO OMVS command on any ISPF panel. From your home directory, enter the following shell commands:

cd /tmp	This is a directory that you have authority to update.
oedit myfile	This opens the ISPF edit panel and creates a new text file in the current path. Write some text into the editor. Save and exit (F3).
ls	Display the current directory listing in terse mode.
ls -l	Display the current directory listing in verbose mode.
myfile	*myfile* can be any file you choose to create.
obrowse myfile	Browse the file you just created.
exit	End the OMVS session.

Some possible classroom demonstrations follow:

- Demonstrate that on the TSO logon screen, you can place an S in front of the RECONNECT option at the bottom of the screen. This allows a user who has lost a connection to a TSO session to regain that connection and avoid having to ask the operator to cancel that running session. The S can be saved there by default.
- z/OS central storage is divided into frames of 4K each, enough to hold one page. When active address spaces need more central storage, z/OS pages out infrequently used storage frames to make them available for use. z/OS uses paging data sets allocated on DASD containing 4K slots of storage to hold these paged-out frames temporarily. In z/OS, the pageable link pack area (PLPA) contains programs that can be paged out. To check the paging activity of your system, enter the following commands:
  D ASM
  D ASM,PLPA
  – How many slots are allocated to hold paged-out PLPA frames?
  – How many have been used?

– What is the name of the paging data set?
– On which direct access storage device (DASD) volume does it reside?

z/OS can also page out the common storage area (CSA). To see this for yourself, enter the following command:

D ASM,COMMON

Working with datasets using ISPF

These lab exercises help you develop skills in working with data sets using ISPF. To perform the lab exercises, you or your team require a TSO user ID and password (for assistance, see the instructor).

Tip: The 3270 Enter key and the PC Enter key can be confused with each other. Most 3270 emulators permit the user to assign these functions to any key on the keyboard, and we assume that the 3270 Enter function is assigned to the right-hand CTRL key. Some z/OS users, however, prefer to have the large PC Enter key perform the 3270 Enter function and have Shift-Enter (or the numeric Enter key) perform the 3270 New Line function.

Exploring ISPF Option 3.4

One of the most useful ISPF panels is Option 3.4. This terminology means, starting from the ISPF primary option menu, select Option 3 (Utilities) and then Option 4 (Dslist, for data set list). This sequence can be abbreviated by entering

3.4 in the primary menu, or =3.4 from any panel.

Many ISPF users work almost exclusively within the 3.4 panels. We cover some of the 3.4 functions here and others in subsequent exercises in this text. Use care in working with 3.4 options; they can effect changes on an individual or system-wide basis.

z/OS users typically use ISPF Option 3.4 to check the data sets on a DASD volume or examine the characteristics of a particular data set. Users might need to know:

- What data sets are on this volume?
- How many different data set types are on the volume?
- What are the DCB characteristics of a particular file?

Let's answer these questions using WORK02 as a sample volume, or another volume as specified by your instructor:

1. In the 3.4 panel, enter WORK02 in the Volume Serial field. Do not enter anything on the Option==> line or in the Dsname Level field.
2. Use PF8 and PF7 to scroll through the data set list that is produced.
3. Use PF11 and PF10 to scroll sideways to display more information. This is not really scrolling in this case; the additional information is obtained only when PF11 or PF10 is used.
   The first PF11 display provides tracks, percent used, XT, and device type. The XT value is the number of extents used to obtain the total tracks shown. The ISPF utility functions can determine the amount of space actually used for some data sets and this is shown as a percentage when possible.
   The next PF11 display shows the DCB characteristics: DSORG, RECFM, LRECL, and BLKSIZE.

PS	Sequential data set (QSAM, BSAM)
PO	Partitioned data set
VS	VSAM data set
blank	Unknown organization (or no data exists)

   RECFM, LRECL, and BLKSIZE should be familiar. In some cases, usually when a standard access method is not used or when no data has been written, these parameters cannot be determined. VSAM data sets have no direct equivalent for these parameters and are shown as question marks.
   Look at another volume for which a larger range of characteristics can be observed. The instructor can supply volume serial numbers. Another way to find such a volume is to use option 3.2 to find where SYS1.PARMLIB resides, then examine that volume.

Allocating a data set with ISPF 3.2

ISPF provides a convenient method for allocating data sets. In this exercise, you create a new library that you can use later in the course for storing program source data. The new data sets should be placed on the *WORK02* volume and should be named *yourid*.LIB.SOURCE (where *yourid* is your student user ID).

For this exercise, assume that 10 tracks of primary space and 5 tracks for secondary extents is sufficient, and that 10 directory blocks is sufficient. Furthermore, we know we want to store 80-byte fixed-length records in the library. We can do this as follows:

1. Start at the ISPF primary menu.
2. Go to option 3.2, or go to option 3 (Utilities) and then go to option 2 (Data Set).
3. Type the letter A in the Option ==> field, but do not press Enter yet.
4. Type the name of the new data set in the Data Set Name field, but do not press Enter yet. The name can be with single quotes (for example, '*yourid*.LIB.SOURCE') or without quotes (LIB.SOURCE) so that TSO/ISPF automatically uses the current TSO user ID as the HLQ.
5. Enter *WORK02* in the Volume Serial field and press Enter.
6. Complete the indicated fields and press Enter:
    - Space Units = TRKS
    - Primary quantity = 10
    - Secondary quantity = 5
    - Directory blocks = 10
    - Record format = FB
    - Record length = 80
    - Block size = 0 (this tells z/OS to select an optimum value)
    - Data set type = PDS

This should allocate a new PDS on *WORK02*. Check the upper right corner, where the following message appears:

Menu RefList Utilities Help

-
Data Set Utility **Data set allocated**
Option ===>
A Allocate new data set C Catalog data set
.....

Copying a source library

A number of source programs are needed for exercises in *ZPROF*.ZSCHOLAR.LIB.SOURCE on WORK02. There are several ways to copy data sets (including libraries). We can use the following:

1. Go to ISPF option 3.3 (Utilities, Move/Copy).
2. On the first panel:
    a. Type C in the Option==> field.
    b. Type '*ZPROF*.ZSCHOLAR.LIB.SOURCE' in the Data Set Name field. The single quotes are needed in this case.
    c. The Volume Serial is not needed because the data set is cataloged.
    d. Press Enter.
3. On the second panel:
    a. Type '*yourid*.LIB.SOURCE' in the Data Set Name field and press Enter. If this PDS does not exist, type 1 to inherit the attributes of the source library. This should produce a panel listing all the members in the input library:
    b. Type S before every member name and then press Enter.

    This copies all the indicated members from the source library to the target library. We could have specified '*ZPROF*.ZSCHOLAR.LIB.SOURCE(*)' for the input data set; this would automatically copy all the members. This is one of the few cases where wild cards are used with z/OS data set names.
4. Create another library and move several members from LIB.SOURCE into the new library. Call it '*yourid*.MOVE.SOURCE'. Verify that the moved members are in the new library and no longer in the old one. Copy those members back into the LIB library. Verify that they exist in both libraries.
5. Rename a member in the MOVE library. Rename the MOVE library to '*yourid*.TEST.SOURCE'.

Working with data set members

There are several ways to add a new member to a library. We want to create a new member named TEST2 to your library that we previously edited:

1. From the ISPF primary menu, use option 2.
2. Enter the name of your library without specifying a member name, for example *yourid*.JCL. This provides a list of member names already in the library.
3. Verify that member EDITTEST has the same contents you used earlier:
    a. If necessary, scroll so you can see member name EDITTEST.
    b. Move the cursor to the left of this line.
    c. Type S and press Enter.
    d. Look at your earlier work to assure yourself it is unchanged.

e. Press PF3 to exit ("back out of") member EDITTEST. You will see the library member name list again.

4. Enter S TEST2 on the command line at the top of the screen and press Enter. (S TEST2 can be read as "select TEST2.") This creates member TEST2 and places the screen in input mode.
5. Enter a few lines of anything, using the commands and functions we discussed earlier.
6. Press PF3 to save TEST2 and exit from it.
7. Press PF3 again to exit from the ISPF Edit function.

Hereafter we will simply say "Enter xxx" when editing something or using other ISPF functions. This means (1) type xxx, and (2) press the Enter key. The New Line key (which has Enter printed on it) is used only to position the cursor on the screen.

Listing a data set and other ISPF 3.4 options

Go to the ISPF 3.4 panel. Enter *yourid* in the Dsname Level field and press Enter. This should list all the cataloged data sets in the system with the indicated HLQ. An alternative is to leave the Dsname Level field blank and enter WORK02 in the Volume Serial field; this lists all the data sets on the indicated volume. (If both fields are used, the list will contain only the cataloged data sets with a matching HLQ that appear on the specified volume.)

A number of functions can be invoked by entering the appropriate letter before a data set name. For example, position the cursor before one of the data set names and press PF1 (Help). The Help panel lists all the line commands that can be used from the data set name list of the 2.4 panel. Do not experiment with these without understanding their functions. Not all of these functions are relevant to this class. The relevant commands are:

E Edit the data set.
B Browse the data set.
D Delete the data set.
R Rename the data set.
Z Compress a PDS library to recover lost space.
C Catalog the data set.
U Uncatalog the data set.

When a member list is displayed (as when a library is edited or browsed) several line commands are available:

S Select this member for editing or browsing.
R Rename the member.
D Delete the member.

Performing a catalog search

The ISPF 3.4 option can be used for catalog searches on partial names. Use PF1 Help to learn more about this important function, as follows:

1. Select option 3.4.
2. Press PF1 for help and select **Display a data set list**. Press Enter to scroll through the information panels.
3. Then select **Specifying the DSNAME LEVEL**. Press Enter to scroll through the information panels.
4. Press PF3 to exit from the Help function.

Notice that the 3.4 DSNAME LEVEL field does not use quotes and the current TSO/E user ID is not automatically used as a prefix for names in this field. This is one of the few exceptions to the general rule for specifying data set names in TSO.

Creating Batch Jobs And Submitting Them

These lab exercises help you develop skills in creating batch jobs and submitting them for execution on z/OS. To perform the lab exercises, you or your team requires a TSO user ID and password (for assistance, see the instructor).

Creating a simple job

1. From ISPF, navigate to the Data Set List Utility panel and enter *yourid*.JCL in the Dsname Level field (described in an earlier exercise).
2. Enter e (edit) to the left (in the command column) of *yourid*.JCL. Enter s (select) to the left of member JCLTEST. Enter RESet on the editor command line.

3. Notice that only a single JCL line is in the data set, EXEC PGM=IEFBR14. This is a system utility that does not request any input or output and is designed to complete with a successful return code (0). Enter SUBMIT or SUB on the command line and press Enter.
4. Enter 1 in response to the message:
   IKJ56700A ENTER JOBNAME CHARACTER(S)
   The result will be the message:
   IKJ56250I JOB *yourid*1(JOB00037) SUBMITTED
   Note: Whenever you see three asterisks (***), it means there's more data to see. Press Enter to continue.
   When the job finishes, you should see the message:
   $HASP165 yourid1 ENDED AT SYS1 MAXCC=0 CN(INTERNAL)
5. Add (insert) a new first line in your file that will hold a JOB statement. The JOB statement must precede the EXEC statement. (Hint: Replicate (r) the single EXEC statement, then overwrite the EXEC statement with your JOB statement.) This JOB statement should read:
   //*yourid*A JOB 1
   Replace "yourid" with your team user ID, leave the "A", then submit this JCL and press PF3 to save the file and exit the editor.
6. From the ISPF Primary Option Menu, find SDSF (described in 7.9.5, "Using SDSF"). You can use the split screen function for a new screen session, giving you one session for the DSLIST and the other for SDSF.
7. In the SDSF menu, enter PREFIX yourid*, then enter ST (Status Panel). Both jobs that you submitted should be listed. Place S (select) to the left of either job, then page up and down to view the messages produced from the execution. Press PF3 to exit.
8. Edit JCLTEST again, and insert the following lines at the bottom:
   //CREATE DD DSN=yourid.MYTEST,DISP=(NEW,CATLG),
   // UNIT=SYSDA,SPACE=(TRK,1)
9. Submit the content of JCLTEST created above, press PF3 (save and exit edit), then view the output of this job using SDSF. Notice that you have two jobs with the same jobname. The jobname with the highest JOBID number is the last one that was run.
   a. What was the condition code? If it was greater than 0, page down to the bottom of the output listing to locate the JCL error message. Correct the JCLTEST and resubmit. Repeat until cond code=0000 is received.
   b. Navigate to the Data Set List Utility panel (=3.4) and enter *yourid*.MYTEST in the DSNAME level field. What volume was used to store the data set?
   c. Enter DEL / in the numbered left (command) column of the data set to delete the data set. A confirmation message may appear asking you to confirm that you want to delete the data set.
   d. We just learned that batch execution of program IEFBR14, which requires no inputs or outputs, returns a condition code 0 (success) if there were no JCL errors. Although IEFBR14 does no I/O, JCL instructions are read and executed by the system. This program is useful for creating (DISP=NEW) and deleting (DISP=(OLD,DELETE)) data sets on a DD statement.
10. From any ISPF panel, enter in the Command Field ==>
    TSO SUBMIT JCL(JCLERROR)
    Your user ID is the prefix (high-level qualifier) of data set JCL containing member JCLERROR.
    a. You will be prompted to enter a suffix character for a generated job card. Take note of the jobname and job number from the submit messages.
    b. Use SDSF and select the job output. Page down to the bottom. Do you see the JCL error? What are the incorrect and correct JCL DD operands? Correct the JCL error located in *yourid*.JCL(JCLERROR). Resubmit JCLERROR to validate your correction.
11. From any ISPF panel, enter TSO SUBMIT JCL(SORT). Your user ID is the assumed prefix of data set JCL containing member SORT.
    a. You will be prompted to enter a suffix character for a generated job card. Take note of the jobname and job number from the submit messages.
    b. Use SDSF and place a ? to the left of the job name. The individual listing from the job will be displayed. Place s (select) to the left of SORTOUT to view the sort output, then press PF3 to return. Select JESJCL. Notice the "job statement generated message" and the "substitution JCL" messages.
12. Let's purge some (or all) unnecessary job output. From SDSF, place a p (purge) to the left of any job that you would like to purge from the JES output queue.

13. From the ISPF panel, enter TSO SUBMIT JCL(SORT) and review the output.
14. From the ISPF panel, enter TSO SUBMIT JCL(SORTPROC) and review the output. You may not see the output in the SDSF ST panel. This is because the jobname is not starting with *yourid*. To see all output, enter PRE *, then OWNER yourid to see only the jobs that are owned by you.
15. What JCL differences exist between SORT and SORTPROC? In both JCL streams, the SYSIN DD statement references the sort control statement. Where is the sort control statement located?

    Tip: All JCL references to &SYSUID are replaced with the user ID that submitted the job.

16. Edit the partitioned data set member containing the SORT control statement. Change FIELD=(1,3,CH,A) to FIELD=(6,20,CH,A). Press PF3 and then from the ISPF panel enter TSO SUBMIT JCL(SORT). Review the job's output using SDSF. Was this sorted by code or area?
17. From the ISPF panel, enter TSO LISTC ALL. By default, this will list all catalog entries for data sets beginning with yourid. The system catalog will return the data set names, the name of the catalog storing the detailed information, the volume location, and a devtype number that equates to specific values for JCL UNIT= operand. LISTC is an abbreviation for LISTCAT.

Using ISPF in split screen mode

As discussed earlier, most ISPF users favor a split screen. This is easily done:

1. Move the cursor to the bottom (or top) line.
2. Press PF2 to split the screen.
3. Press PF9 to switch between the two screens.
4. Use PF3 (perhaps several times) to exit from one of the splits. The screen need not be split at the top or bottom. The split line can be positioned on any line by using PF2. More than two screens can be used. Try to use these ISPF commands:
   START
   SWAP LIST
   SWAP <screen number.>

Manipulating text in ISPF

After logging on to TSO/E and activating ISPF, look at the primary option menu.

1. Enter each option and write down its purpose and function. Each team should prepare a brief summary for one of the 12 functions on the ISPF panel (Items 0-11). Note that z/OS installations often heavily customize the ISPF panels to suit their needs.
2. Create a test member in a partitioned data set. Enter some lines of information, then experiment with the commands below. Use PF1 if you need help.

i	Insert a line.
Enter key	Press Enter without entering anything to escape insert mode.
i5	Obtain 5 input lines.
d	Delete a line.
d5	Delete 5 lines.
dd/dd	Delete a block of lines (place a DD on the first line of the block and another DD on the last line of the block).
r	Repeat (or replicate) a line.
rr/rr	Repeat (replicate) a block of lines (where an RR marks the first line of the block and another RR marks the last line).
c along with a or b	Copy a line after or before another line.
c5 along with a or b	Copy 5 lines after or before another line.
cc/cc along with a or b	Copy a block of lines after or before another line.
m, m5, mm/mm	Move line(s).
x, x5, xx/xx	Exclude lines.
s	Redisplay (show) the lines you excluded.
(	Shift right columns.
)	Shift left columns.
<	Shift left data.
>	Shift right data.

Submitting a job and checking the results

Edit member COBOL1 in the *yourid*.LIB.SOURCE library and inspect the COBOL program. There is no JCL with it. Now edit member COBOL1 in *yourid*.JCL.[1] Inspect the JCL carefully. It uses a JCL procedure to compile and run a COBOL program.[2] Follow these steps:

1. Change the job name to *yourid* plus additional characters.
2. Change the NOTIFY parameter to your user ID.
3. Add TYPRUN=SCAN to your job card.
4. Type SUB on the ISPF command line to submit the job.
5. Split your ISPF screen and go to SDSF on the new screen (you might have this already from an earlier exercise).
6. In SDSF go to the ST (Status) display and look for your job name.
   You may need to enter a PRE or OWNER command on the SDSF command line to see any job names. (A previous user may have issued a prefix command to see only certain job names.
7. Type S beside your job name to see all of the printed output:

- Messages from JES2
- Messages from the initiator
- Messages from the COBOL compiler
- Messages from the binder
- Output from the COBOL program

8. Remove TYPRUN=SCAN when you are ready to run your job.
9. Use PF3 to "move up" a level and type ? beside your job name to display another output format.

The instructor can tell you the purposes of the various JES2 and initiator messages.

- Resubmit the job with MSGLEVEL=(1,1) on the JOB statement.
- Resubmit the job with MSGLEVEL=(0,0) on the JOB statement.

The MSGLEVEL parameter controls the number of initiator messages that are produced.

Creating a PDS member

There are several ways to create a new PDS member. Try each of the following, using your own user ID. In the following steps, TEST3, TEST4, TEST5, and TEST6 represent new member names. Enter a few lines of text in each case. Use the ISPF edit panel:

- Go to the ISPF primary menu.
- Go to option 2 (Edit).
- In the Data Set Name line, enter JCL(TEST3) (no quotes!)
- Enter a few text lines and use PF3 to save the new member.

A new member can be created while viewing the member list in edit mode:

- Use option 3.4 (or option 2) to edit *yourid*.JCL.
- While viewing the member list, enter S TEST4 in the command line.
- Enter a few text lines and use PF3 to save the new member.

A new member can be created while editing an existing member:

- Edit yourid.JCL(TEST1) or any other existing member.
- Select a block of lines by entering cc (in the line command area) in the first and last lines of the block.
- Enter CREATE TEST5 on the command line. This will create member TEST5 in the current library.

A new member can be created with JCL. Enter the following JCL in *yourid*.JCL(TEST5) or any other convenient location:

[1] The matching member names (COBOL1) are not required; however, they are convenient.

[2] This is not exactly the COBOL procedure we discussed earlier. Details of these procedures sometimes change from release to release of the operating system.

```
//yourid1 JOB 1,JOE,MSGCLASS=X
//STEP1 EXEC PGM=IEBGENER
//SYSIN DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSUT2 DD DISP=OLD,DSN= yourid.JCL(TEST6)
//SYSUT1 DD *
This is some text to put in the member
More text
/*
```

Save the member with this JCL. It will be used later.

Copying a PDS member

There are many ways to copy a library member. An earlier exercise used the ISPF 3.3 panel function to copy all the members of a library. The same function can be used to copy one or more members.
While editing a library member, we can copy another member of the library into it:

- Edit a library member.
- Mark a line in this member with a (after) or b (before) to indicate where the other member should be copied.
- Enter COPY xxx on the command line, where xxx is the name of another member in the current data set.

We can copy a member from another data set (or a sequential data set) as follows:

- Edit a member or sequential data set.
- Mark a line with A (after) or B (before) to indicate where to insert the new material.
- Enter COPY on the command line to display the Edit/View-Copy panel.
- Enter the full sequential data set name (with single quotes, if necessary) or a full library name (including member name) in the Data Set Name field.

Learning about system volumes

Use the ISPF functions to explore several system volumes. The following are of interest:

- Examine the naming of VSAM data sets. Note the words DATA and INDEX as the last qualifier.
- Find the spool area. This may involve a guess based on the data set name. How large is it?
- Find the basic system libraries, such as SYS1.PROCLIB and so forth. Look at the member names.
- Consider the ISPF statistics field that is displayed in a member list. How does it differ for source libraries and execution libraries?

Using a utility program in a job

z/OS has a utility program named IEBGENER to copy data. It uses four DD statements:

- SYSIN for control statements. We can code DD DUMMY for this statement, because we do not have any control statements for this job.
- SYSPRINT for messages from the program. Use SYSOUT=X for this lab.
- SYSUT1 for the input data.
- SYSUT2 for the output data.

The basic function of the program is to copy the data set pointed to by SYSUT1 to the data set pointed to by SYSUT2. Both must be sequential data sets or members of a library.
The program automatically obtains the data control block (DCB) attributes from the input data set and applies them to the output data set. Write the JCL for a job to list the *yourid*.JCL(TEST1) member to SYSOUT=X.

Examining the TSO logon JCL

The password panel of the TSO logon process contains the name of the JCL procedure used to create a TSO session. There are several procedures with different characteristics.
Look at the ISPFPROC procedure. The instructor can help find the correct library for ISPFPROC.

- What is the name of the basic TSO program that is executed?
- Why are there so many DD statements? Notice the concatenation.

Look for procedure IKJACCNT. This is a minimal TSO logon procedure.

Exploring the master catalog

Go to ISPF option 6 and do the following:

- Use a LISTC LEVEL(SYS1) command for a basic listing of all the SYS1 data sets in the master catalog.
- Notice that they are either NONVASM or CLUSTER (and associated DATA and INDEX entries). The CLUSTERs are for VSAM data sets.
- Use the PA1 key to end the listing (for help, see 3.3.3, "Using the PA1 key" on page 3-14).
- Use a LISTC LEVEL(SYS1) ALL command for a more extended listing.
  Note the volser and device type data for the NONVSAM data sets. This is the basic information in the catalog.
- Use LISTC LEVEL(xxx) to view one of the ALIAS levels and note that it comes from a user catalog.

Note: If you enter the profile command with NOPREFIX, it produces a system-wide display when you enter the commands LISTC and LISTC ALL. These commands allow you to see all of the entries in the master catalog, including ALIAS entries.

Using SDSF

From the ISPF Primary Option Menu, locate and select the System Display and Search Facility (SDSF). This utility allows you to display output data sets. The
ISPF Primary Option Menu typically includes more selections than those listed on first panel, with instructions about how to display the additional selections.
Return to 6.14.1, "Creating a simple job" and repeat through Step 5 if needed. This will provide a job listing for this exercise.

SDSF Exercise 1

While viewing the output listing, assume that you want to save it permanently to a data set for later viewing. At the command input line, enter PRINT D. A window will prompt you to enter a data set name in which to save it. You can use an already existing data set or create a new one.
For this example, create a new data set by entering yourid.cobol.list. In the disposition field, enter NEW. Press Enter to return to the previous screen. Note that the top right corner of the screen displays PRINT OPENED. This means you can now print the listing. On the command input, enter PRINT. Displayed at the top right of the screen will be the number of lines printed (xxx LINES PRINTED). This means the listing has now been placed in the data set that you created. On the command line, enter PRINT CLOSE. At the top right screen you should now see PRINT CLOSED.
Now let's look at the data set you created, yourid.cobol.list, and view the listing. Go to =3.4 and enter your user ID. A listing of all your data sets should appear. Locate yourid.cobol.list and enter a B next to it in the command area. You should see the listing exactly as it appeared when you were using SDSF. You can now return to SDSF ST and purge (P) your listing, because you now have a permanent copy.
Return to the main SDSF panel and enter LOG to display a log of all activity in the system. Here, you can see much the information that the Operations Staff might see. For example, at the bottom of the list, you might see the outstanding Reply messages to which an operator can reply.

```
/R xx,/DISP TRAN ALL
```

Scroll to the bottom to see results. Note that operator commands from the SDSF LOG command must be preceded by a forward slash (/) so that it is recognized as a system command.
Now, enter M in the command input and press F7; this will display the top of the log. Type F and your user ID to display the first entry associated with your user ID. Most likely this will be when you logged onto TSO. Next enter F youridX, where X represents one of the jobs you submitted above. Here you should see your job being received into the JES2 internal reader, and following that a few lines indicating the status of your job as it runs. Perhaps you might see a JCL error, or youridX started | ended.

SDSF Exercise 2

This exercise uses the Print functions above. Save the log into a data set exactly as you did in the Print exercise.

SDSF Exercise 3

In this exercise, you enter operator commands from the Log screen. Enter the following at the Command input line and look at the resulting displays:

/D A,L	This lists all active jobs in the system.
/D U,,,A80,24	This lists currently online DASD VOLUMES.
/V A88,OFFLINE	Scroll to the bottom to see results (M F8).
/D U,,,A88,2	Check its Status; note that VOLSER is not displayed for offline volumes. While a volume is offline, you can run

	utilities such as ICKDSF, which allows you to format a volume.
/V A88,ONLINE	Scroll to the bottom and see the results.
/D U,,,A88,2	Check its status; VOLSER is now displayed.
/C U=*yourid*	Cancels a job (your TSO session in this case).
Logon *yourid*	Log back onto your ID.

More Exercises

1. Find out which IEASYSxx members were used in the current IPL. Did the operator specify the suffix of an alternate IEASYSxx?
2. Did the operator specify any parameter in response to the message SPECIFY SYSTEM PARAMETERS? If the answer is Y, find the related PARMLIB members for that parameter and obtain the parameter value that would be active if that operator response hadn't occurred.
3. Do the following:
    - On your system, find out the IPL device address and the IPL Volume. Go to SDSF, enter ULOG, and then /D IPLINFO.
    - What is the IODF device address?
    - What is the LOADxx member that was used for IPL? What is the data set that contains this LOADxx member?
    - Browse this member; what is the name of the system catalog used by the system?
    - What is the name of the IODF data set currently used? Enter /D IOS,CONFIG.
    - The system parameters can come from a number of PARMLIB data sets. Enter /D PARMLIB. What are the PARMLIB data sets used by your system?
1. Try to log on to TSO after changing the initial logon procedure IKJACCNT to IKJACCN1. The expected message is:

    IKJ56483I THE PROCEDURE NAME IKJACCN1 HAS NOT BEEN AUTHORIZED FOR THIS USERID
2. Using your TSO user ID (now with your default logon procedure IKJACCNT), try to delete the data set *ZPROF*.JCL.NOT.DELETE, which is set up by the standard jobs in the supplied JCL. This is a protected data set and you can only read its content.
3. Execute the next sample JCL to obtain a DSMON utility report with the current RACF group tree structure (available in the sample JCL as member DSMON):

```
//DSMONRPT JOB (POK,999),'DSMONREPORT',MSGLEVEL=(1,1),MSGCLASS=X,
// CLASS=A,NOTIFY=&SYSUID
/*JOBPARM SYSAFF=*
//*
//* NOTE:
//* REMEMBER THAT ICHDSM00 MUST BE RUN BY A USER WITH AUDITOR ATTRIBUTE
//*
//STEPNAME EXEC PGM=ICHDSM00
//SYSPRINT DD SYSOUT=A
//SYSUT2 DD SYSOUT=A
//SYSIN DD *
FUNCTION RACGRP
/*
```

4. Verify that the SYS1.LINKLIB library is an APF-authorized library.
    - Using the DISPLAY APF command to display the entire APF list.
    - Using the ENTRY= operand in the DISPLAY APF command.
    - Using the DSNAME= operand in the DISPLAY APF command. Verify the entry number in the command display result in the syslog.
5. The following JCL example can be used to invoke the ADRDSSU utility and issue a WTOR message in the console. The WTOR command lets you write an ADR112A message to the system console. The ADR112A message requests that the operator perform some action, and then issue a reply. You can use WTOR, for example, to request that the operator mount a required volume or quiesce a database before your DFSMSdss job continues to process (available in the sample JCL as member ADRDSSU).

```
//WTORTEST JOB (POK,999),'USER',MSGLEVEL=(1,1),MSGCLASS=X,
// CLASS=A,NOTIFY=&SYSUID
// EXEC PGM=ADRDSSU
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
```

```
WTOR 'TEST'
/*
```

DFSMSdss assigns the following routing code to the WTOR message:

1. Primary operator action

DFSMSdss assigns the following descriptor code to the WTOR message:

2. Immediate action required

In the SDSF main screen, choose the SR option (system requests) and reply with any response you want.