INFO3105 Week 7 Part 1

Review

- Midterm

DFSort

This week we will look at a couple of mainframe utilities that we're going to utilize in our 2nd case study. Today, we'll get familiar with a utility called **DFSORT**. This utility will be used in conjunction with another utility called Access Method Services (**AMS**) to create the files needed for the 2nd case.

The sort concept is pretty simple:

1. Specify a file to be sorted (SORTIN)
2. Specify a different file where the sorted output will reside (SORTOUT)
3. Tell the utility the sort instructions, i.e. - Which fields to sort on.

We can use our salesperson master file from case 1 and use it as our input data. Currently this file is sorted on branch number. But let's say we wanted an alphabetical list of Salespeople by last & first name regardless of branch. To do so is relatively easy:

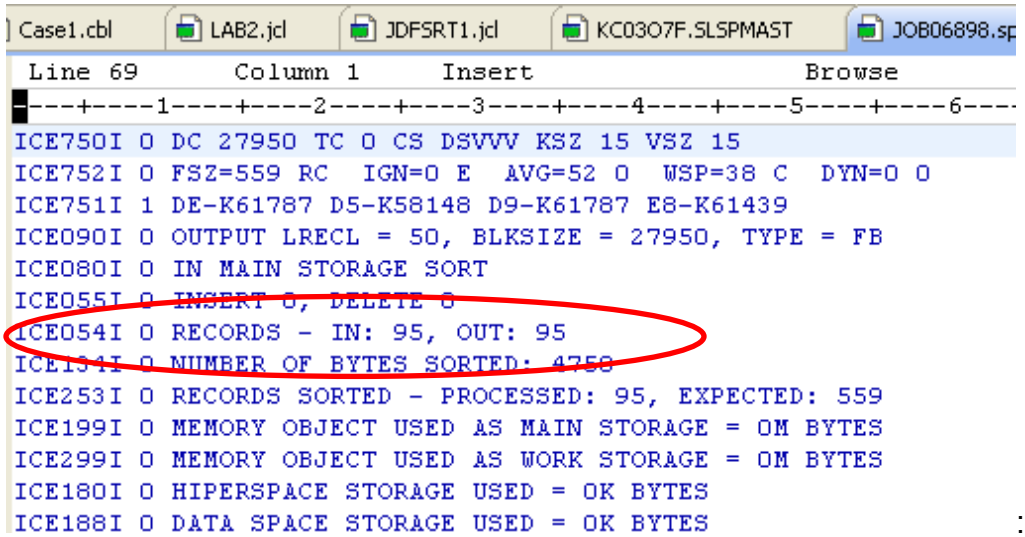
- Create a new JCL member called **JDFSRT1** .
- Create the sequential SORTOUT file called KC03xxx.SLSPBYNM that will be updated by the JCL with the salesperson master file sorted by name.
- Place the following JCL inside this member:

```
//--+----1----+----2----+----3----+----4----+----5----+----6----+----
//JDFSRT1 JOB JDSFSRT1,NOTIFY=&SYSUID
//*************************************************************
//*  DFSORT EXAMPLE TO SORT SLSPMAST ON SURNAME               *
//*************************************************************
//STEP1 EXEC PGM=SORT,REGION=1024K
//SYSOUT     DD SYSOUT=*
//SORTIN     DD DSN=&SYSUID..SLSPMAST,DISP=SHR
//SORTOUT    DD DSN=&SYSUID..SLSPBYNM,DISP=SHR
//SYSIN      DD *
  SORT FIELDS(6,15,CH,A,21,10,CH,A)
/*
```

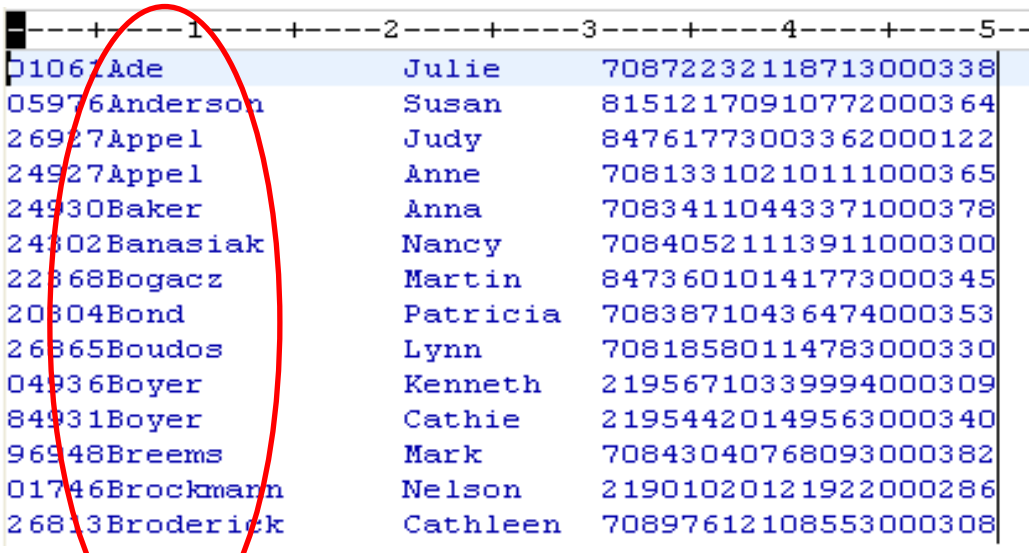
The only new information in this JCL is the SORT FIELDS line:

- 6 – Start position
- 15 – Length of sort field - the salesperson last name
- CH – indicates character data
- A – indicates ascending

...etc. Submit the JCL and then look at the contents of the spooled output file first. What you are looking for is the number of records sorted, the sorted in and sorted out should be the same and equal to the number of records in the input file



Once this is confirmed, just look at the new file contents:

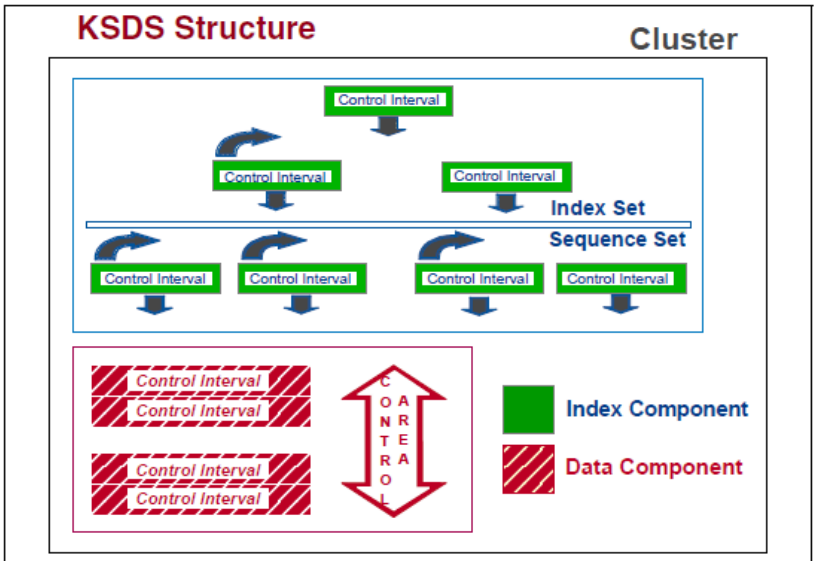


I have placed a new salesperson file on FOL in the week 7 content. This data is a bit different than the data above / in the first case study. In addition to the branch number there is now a **2 byte department number** adjacent to the branch number. The new file length is now **52** bytes.

Introduction Access Method Services

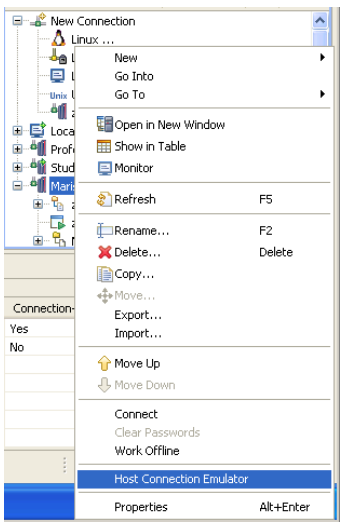
A lot of mainframe programs utilize indexed files. These kinds of files were the predecessors to relational databases. Like a database they can be updated and read randomly. In the mainframe world these kinds of files are used with a technology called

VSAM (Virtual Storage Access Method). To create and use these types of files we need to run a utility called **Access Method Services**. The theory for using VSAM files starts on **page 550** of the text, I am not going to repeat what the text says but you should understand the concepts of Control Intervals and Control Areas (**pages 550 and 551**) as this is how real records are stored on the hard drive. If you think about it, the architecture is conceptually the same as how a relational database stores its data (row, page, extent). Basically one or more real records are stored in a CI and one or more CI's are stored in a CA.



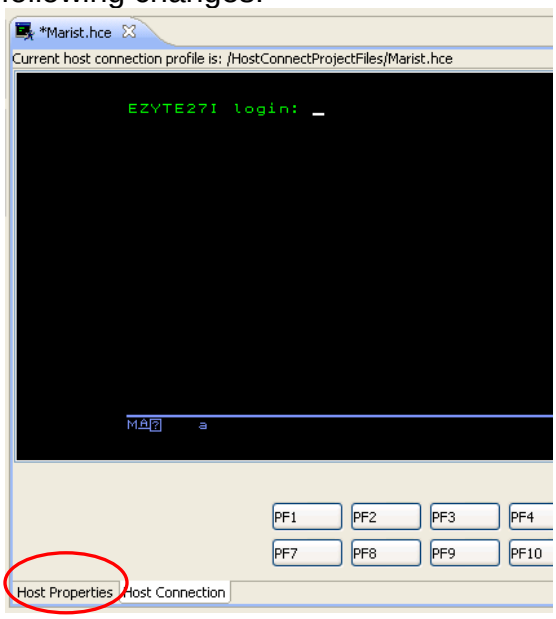
There are 3 types of files created in VSAM; ESDS (sequential), RRDS (Relative Record Data Set) and **KSDS** (Key Sequenced Data Set). Both KSDS and RRDS allow for better access than sequential files but KSDS's are used more frequently so we're going to focus on that type for the second case study.

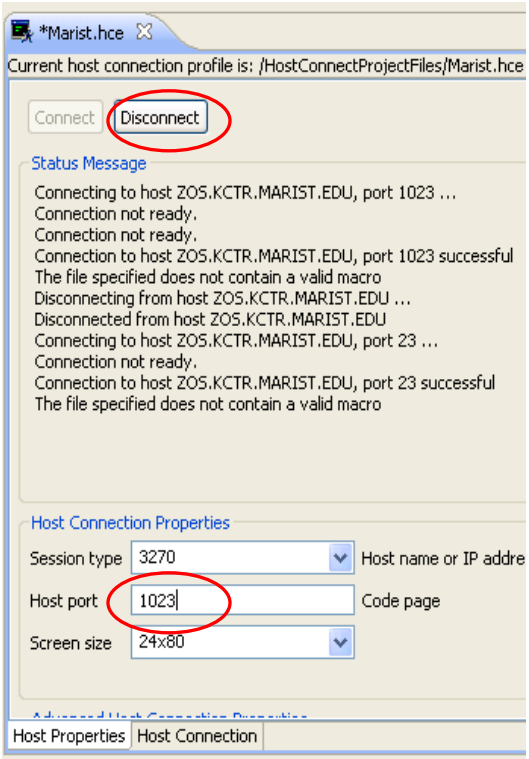
Our first task is to define a KSDS to house our new Salesperson data. What a KSDS allows, is to look up things randomly; we can't do this with our current sequential file. The KSDS has an index based on a key and we can look up or update individual records based on that key. So we'll start and define our KSDS using a utility in **ISPF** for manipulating VSAM files. Note you **might be able to** define KSDS files with the IDZ client software, but it is important to learn how to use the ISPF environment, so you must **define these directly on the host** using **emulator** software called the the **Host Connection Emulator** option (also see week 1's notes for logging into TSO).

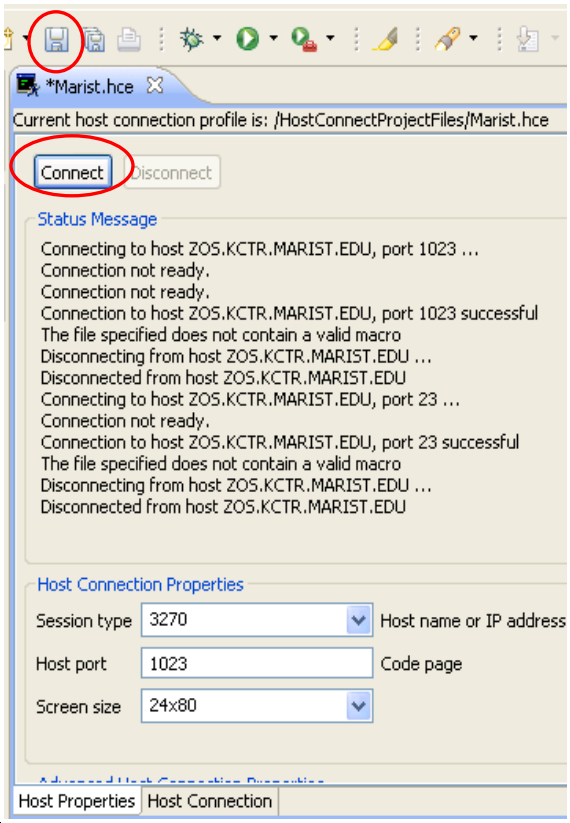


Then we will connect to the system (right click **Marist** choose **Host Connection Emulator** option:

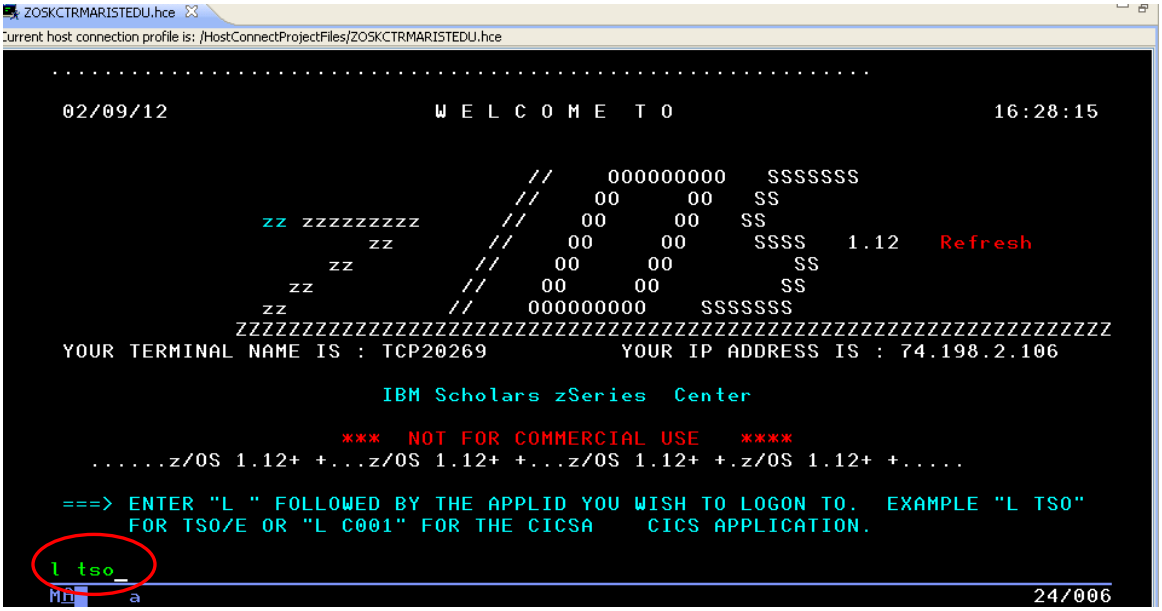
Note this will default to port 23, we actually want to use **port 1023**, so make the following changes:





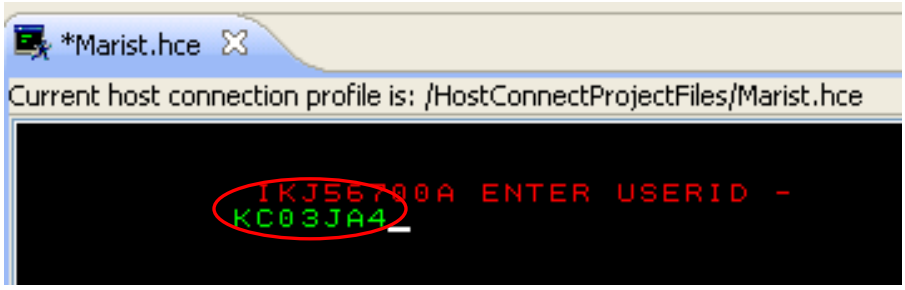


Save these settings with the save icon before connecting



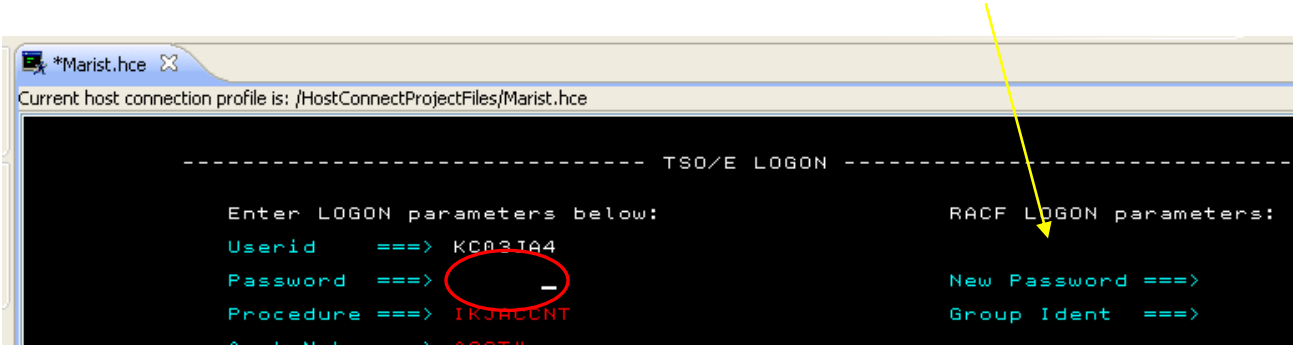
Next we'll logon to **TSO** which is the ZOS interactive environment -use command **L tso**.

When prompted for a **userid** use the one that is **assigned to you** in class!
Note for demonstration purposes I am using a couple of accounts **KC03JA4, KC03N5F, and KC03O7F** in today's examples.

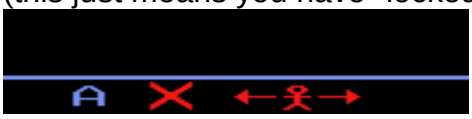


WARNING note best not to use the mouse ... but to use the tab key ONLY if you need to change fields...

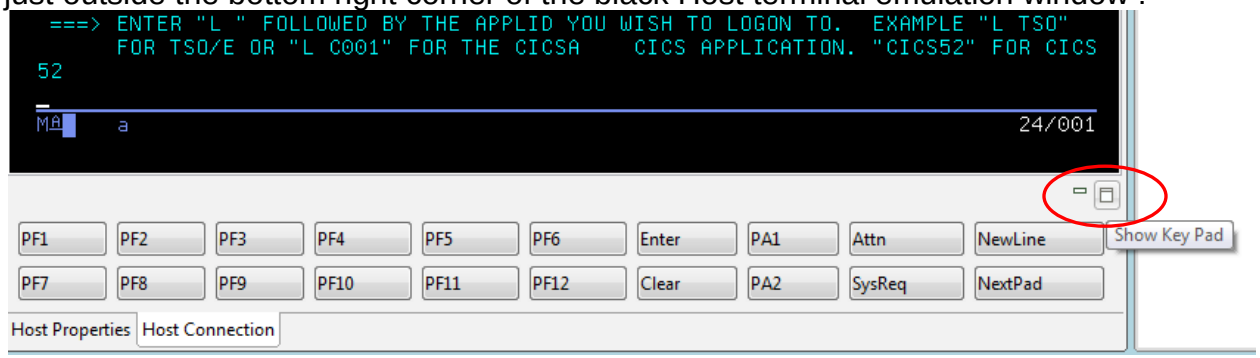
Notice where the cursor is - and use TAB vs using a mouse click to get to the correct field. Note password rules min 6, max 8 characters.



Note ==> You will need to use the TAB key to move from one input field to the next (not the mouse ...) . If you type in a place on the screen that is not an input field, you will see a capital X with a little stick person in the middle of arrows pointing left and right (this just means you have "locked up your screen / session ") .

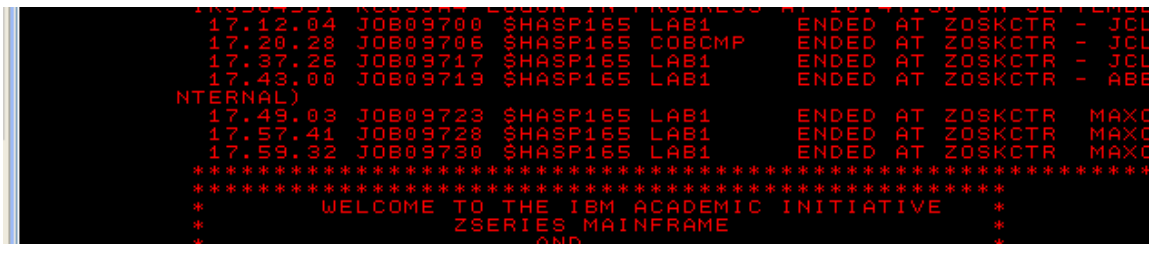


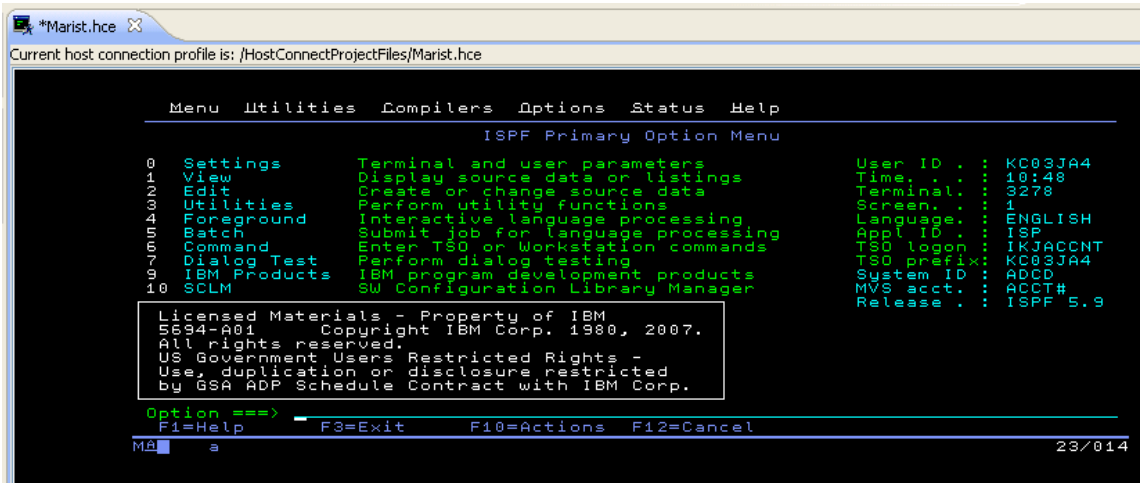
IF this happens, you may be able to clear it by pressing Esc, or you will need to click just outside the bottom right corner of the black Host terminal emulation window :



to Show Key Pad, then click on the Attn button, then Enter to allow the host to accept your keyboard input.

You will see a bunch of red screens appear, just keep hitting enter until you see the following:

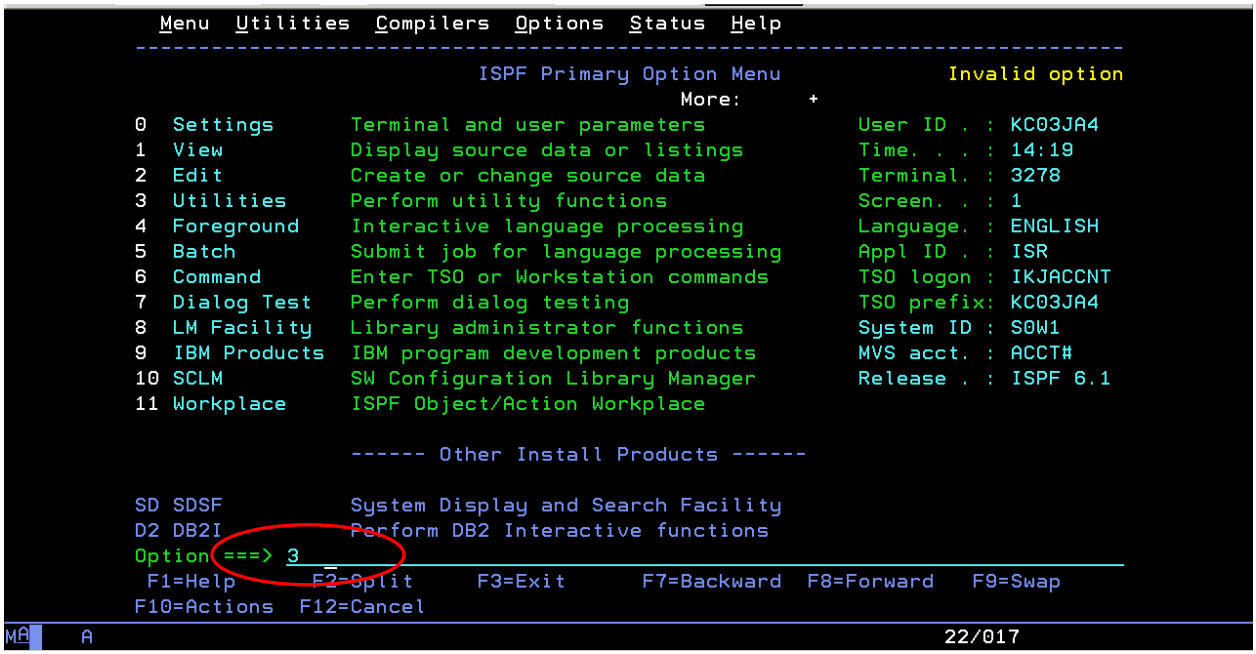


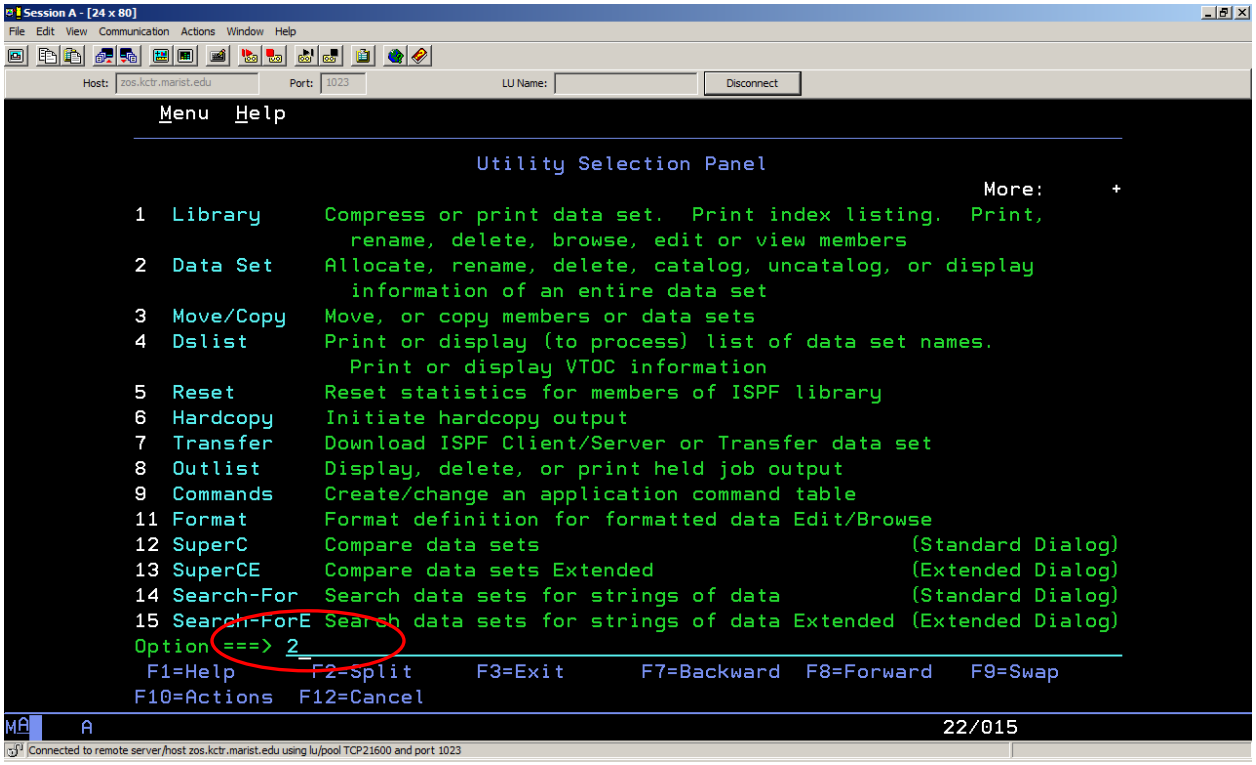


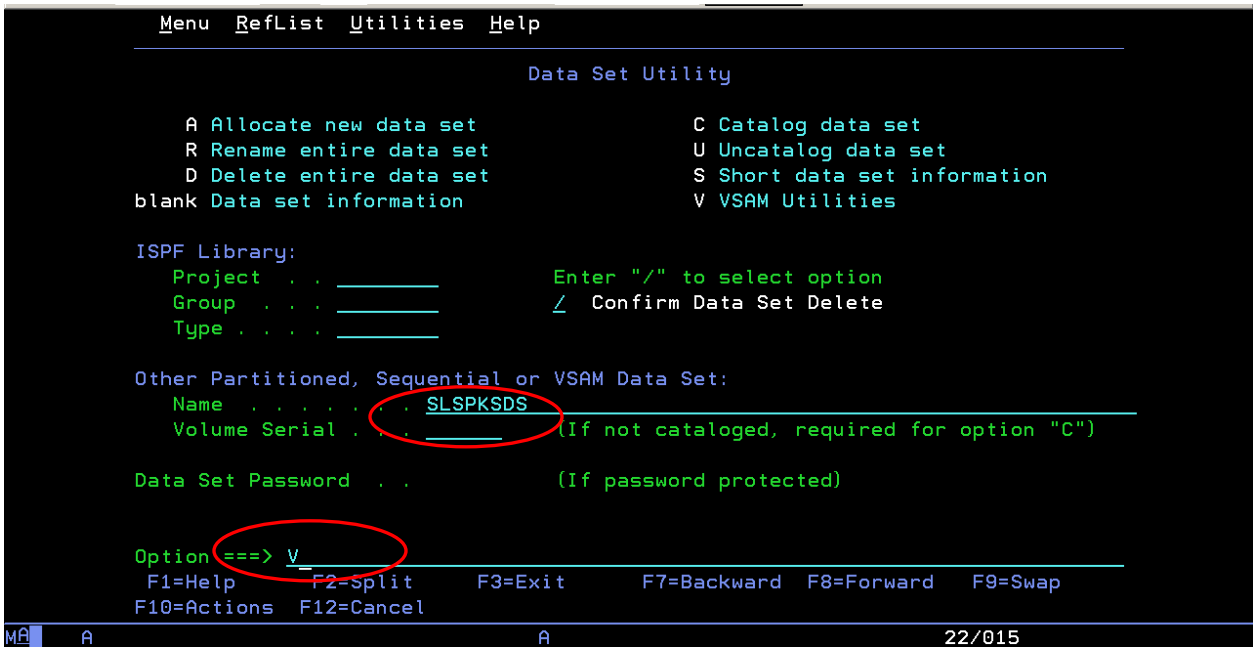
We are now logged on!

NOTE : You must **press the <ENTER> key to process each "command" or option # in this TSO/ISPF environment.** Once in TSO, to get into this utility you need to enter the following ISPF menu commands (in **BLUE on screen shots)** , starting from the Main Menu in ISPF:

- **3** – Utilities
  - **2** – Data Set
    - VSAM Data Set : Name - **SLSPKSDS**
    - Command – **V**
      - VSAM UTILITIES
        - **1** – Define
        - **3** – Cluster
        - DEFINE CLUSTER
          - Space Units – **3** Records
          - Primary – **50**
          - Secondary – **5**
          - **<ENTER>** to get into the editor


Menu Utilities Compilers Options Status Help
ISPF Primary Option Menu
Invalid option
More: +
0 Settings Terminal and user parameters
1 View Display source data or listings
2 Edit Create or change source data
3 Utilities Perform utility functions
4 Foreground Interactive language processing
5 Batch Submit job for language processing
6 Command Enter TSO or Workstation commands
7 Dialog Test Perform dialog testing
8 LM Facility Library administrator functions
9 IBM Products IBM program development products
10 SCLM SW Configuration Library Manager
11 Workplace ISPF Object/Action Workplace
User ID . : KC03JA4
Time. . . : 14:19
Terminal. : 3278
Screen. . : 1
Language. : ENGLISH
Appl ID . : ISR
TSO logon : IKJACCNT
TSO prefix: KC03JA4
System ID : S0W1
MVS acct. : ACCT#
Release . : ISPF 6.1
------ Other Install Products ------
SD SDSF System Display and Search Facility
D2 DB2I Perform DB2 Interactive functions
Option ===> 3
F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
F10=Actions F12=Cancel
MA A 22/017

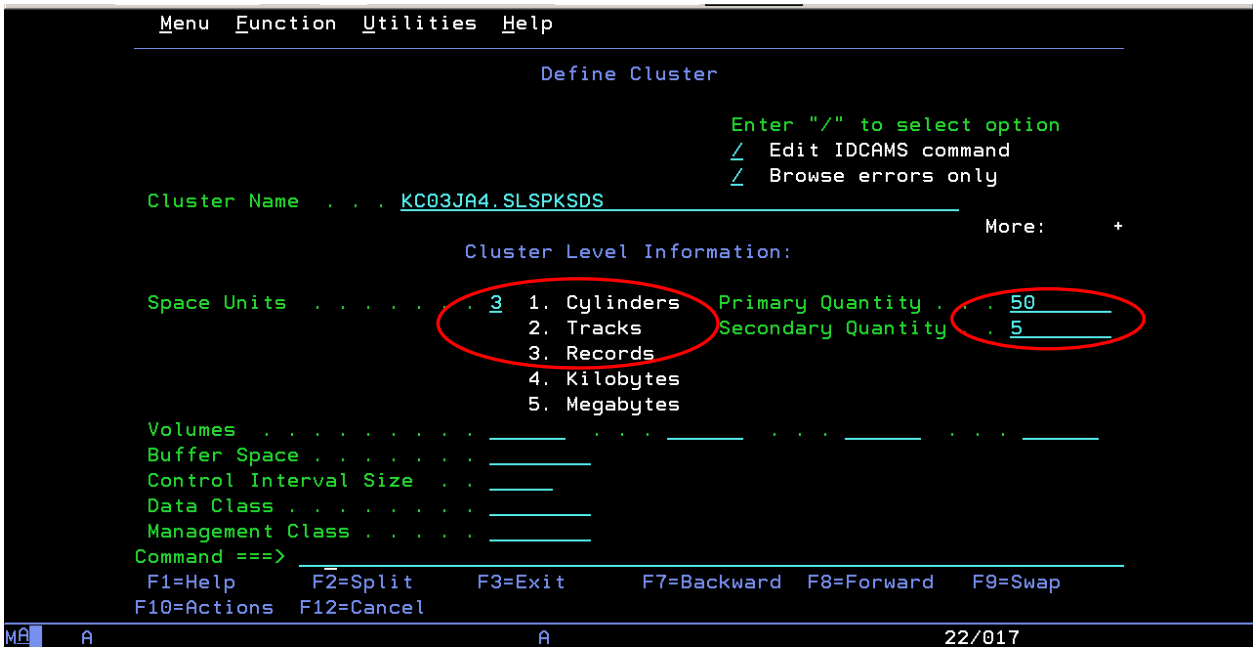

Session A - [24 x 80]
File Edit View Communication Actions Window Help
Host: zos.kctr.marist.edu
Port: 1023
LU Name:
Disconnect
Menu Help
Utility Selection Panel
More: +
1 Library Compress or print data set. Print index listing. Print, rename, delete, browse, edit or view members
2 Data Set Allocate, rename, delete, catalog, uncatalog, or display information of an entire data set
3 Move/Copy Move, or copy members or data sets
4 Dslist Print or display (to process) list of data set names. Print or display VTOC information
5 Reset Reset statistics for members of ISPF library
6 Hardcopy Initiate hardcopy output
7 Transfer Download ISPF Client/Server or Transfer data set
8 Outlist Display, delete, or print held job output
9 Commands Create/change an application command table
11 Format Format definition for formatted data Edit/Browse
12 SuperC Compare data sets (Standard Dialog)
13 SuperCE Compare data sets Extended (Extended Dialog)
14 Search-For Search data sets for strings of data (Standard Dialog)
15 Search-ForE Search data sets for strings of data Extended (Extended Dialog)
Option ===> 2
F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
F10=Actions F12=Cancel
MA A 22/015
Connected to remote server/host zos.kctr.marist.edu using lu/pool TCP21600 and port 1023



Name ... SLSPKSDS AND Option ==> V

1 1. Define AND 3 for Cluster

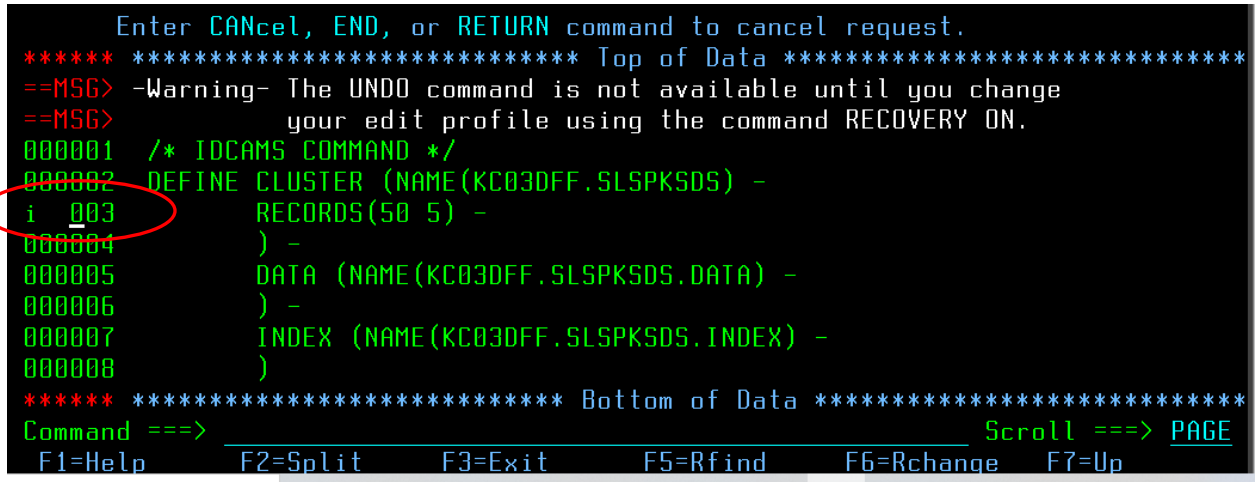
Note if this doesn't work correctly you will need to back out (F3=Exit) to here and chose option 2 . Delete to delete this VSAM Cluster/file



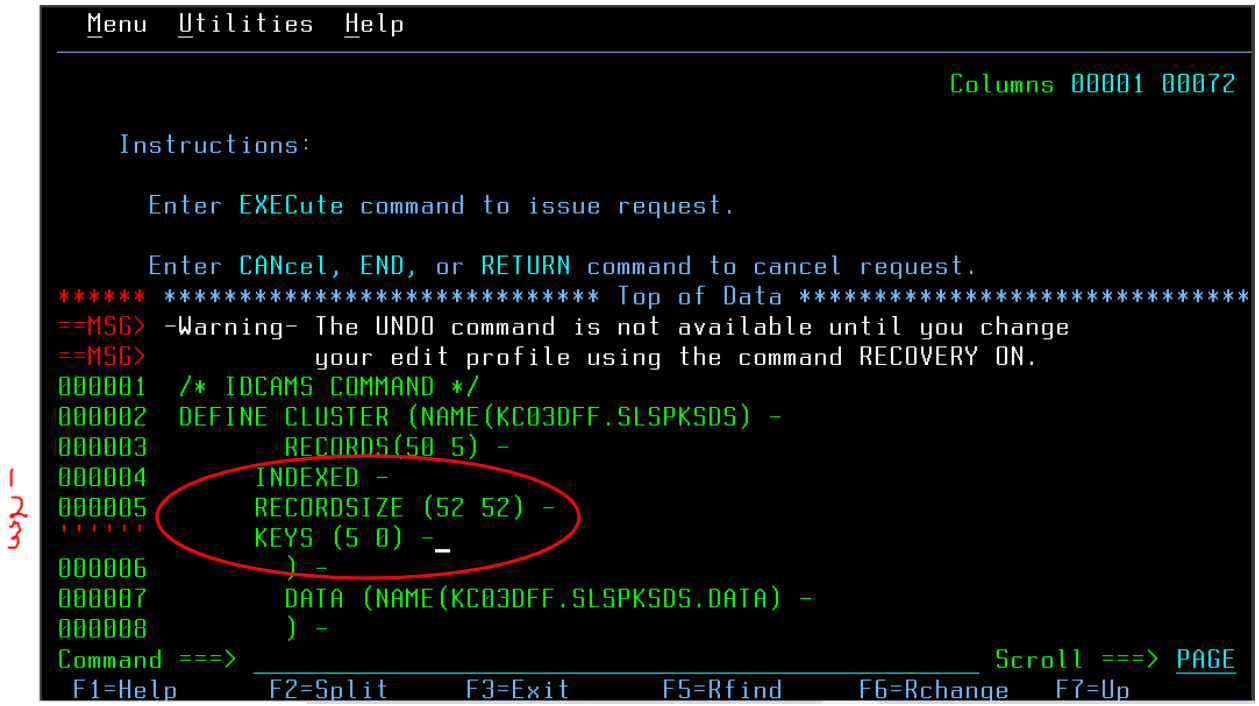
You will need to **add 3 lines (you can't cut and paste, but must Use the line command "I" for Insert and then type them in)**:

- INDEXED –
- RECORDSIZE (52 52) –
- KEYS (5 0) –

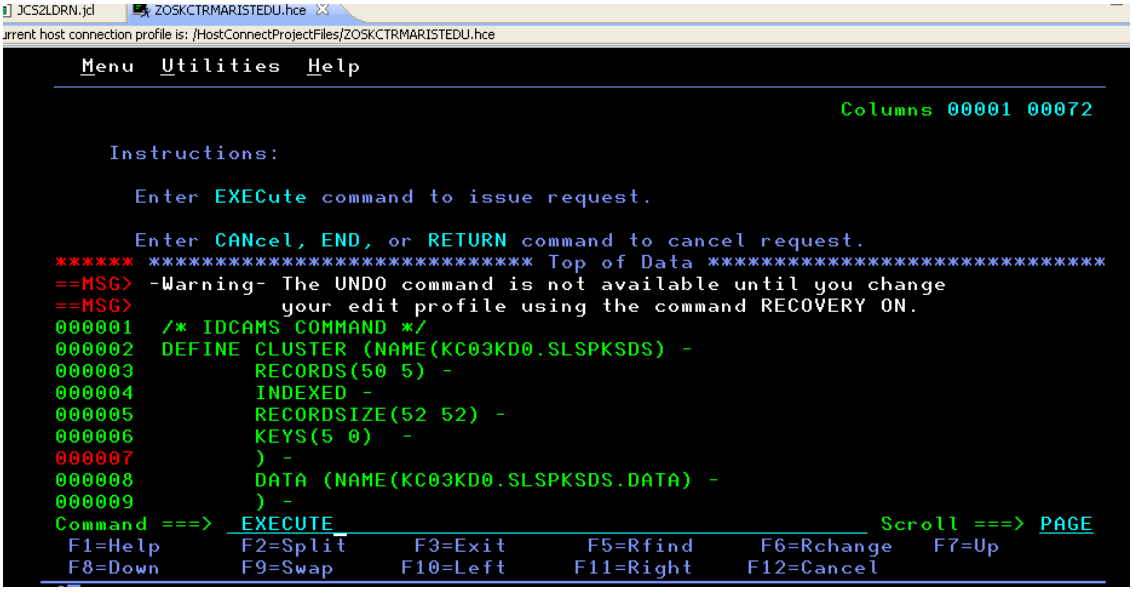
Like this :



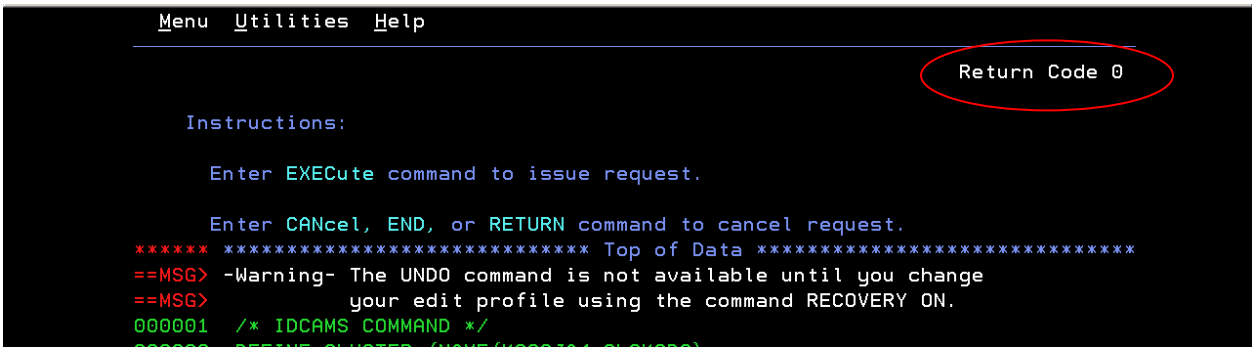
And this :



- Remember to include the Hyphen - at the end of each line – it is a **continuation character and is required or you will get an execution error**
- When the inserts are all ready they should look like this:



NOTE: THE HYPHEN - AT THE END of each line is **REQUIRED** … Then enter the **EXECUTE** in the command area and after you press Enter to execute this, look for **Return Code 0**



Make sure to capture / save a screen shot at this point as it is part of the lab today.

What we have accomplished is that we now have created a VSAM KSDS (indexed file) called SLSPKSDS with a record length of 52 and the key defined in bytes 1-5.

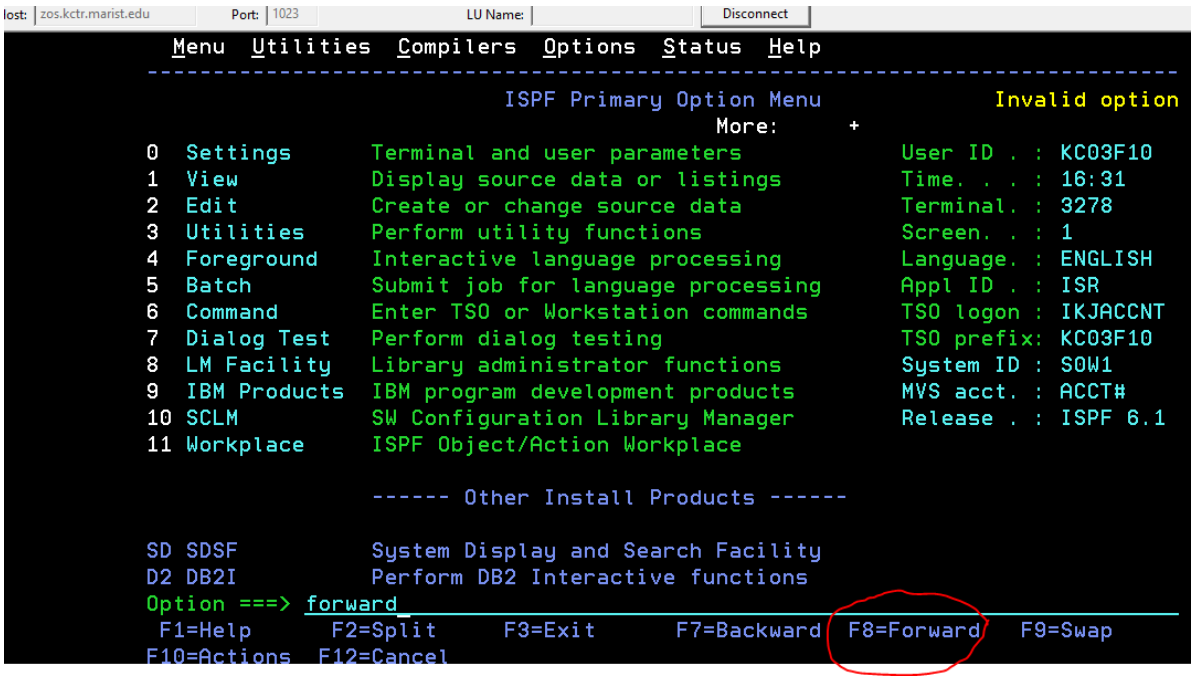
Once complete use the PF3 function key (or the Exit Option/Command) to back out back to the main ISPF menu.

The IDZ Remote System Explorer view of these files may not allow us to view (or change) these VSAM files, so we will use the ISPF F (for File Manager) option to view them. This is how to do this:

- Options from Main ISPF menu are :

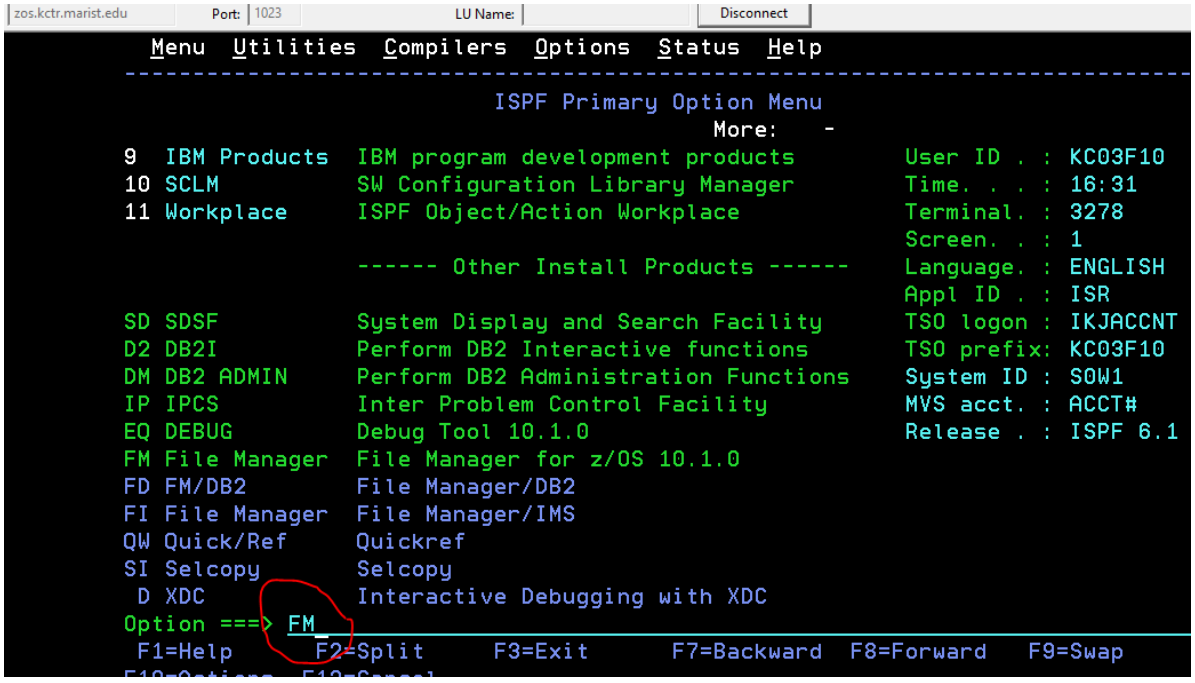
- F (not FM – that was a previous version of File Manager...) , then option 1 View, then specify your VSAM file beside Data Set Name ===>

How to Screen shots

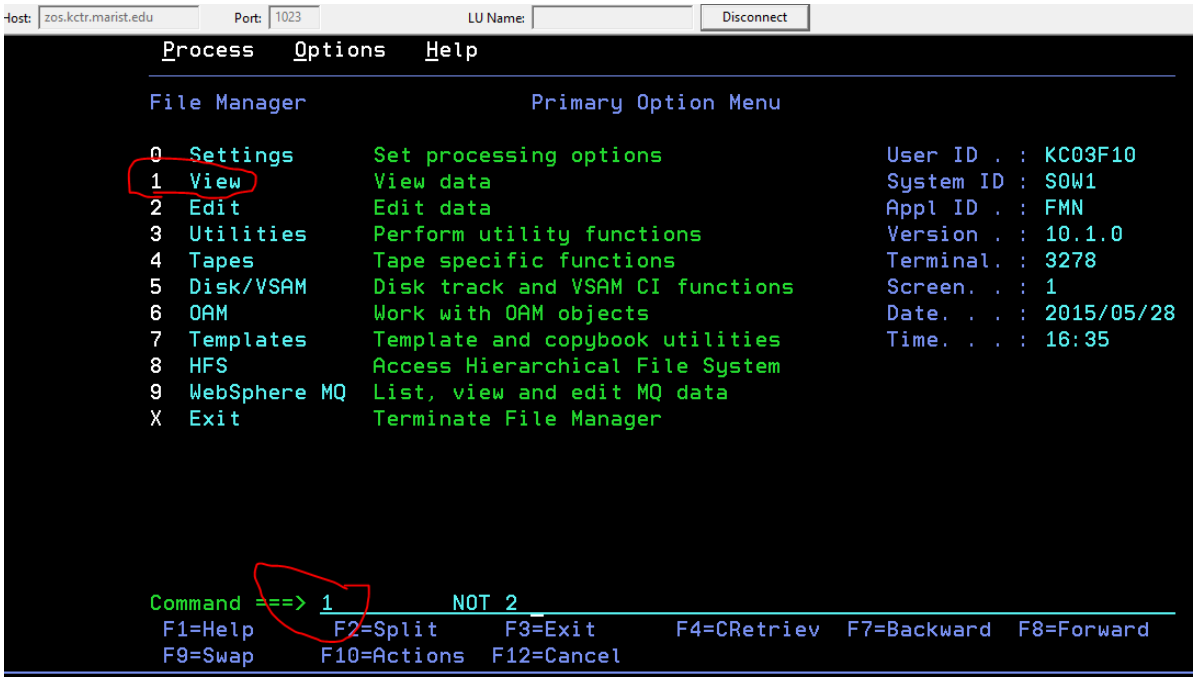


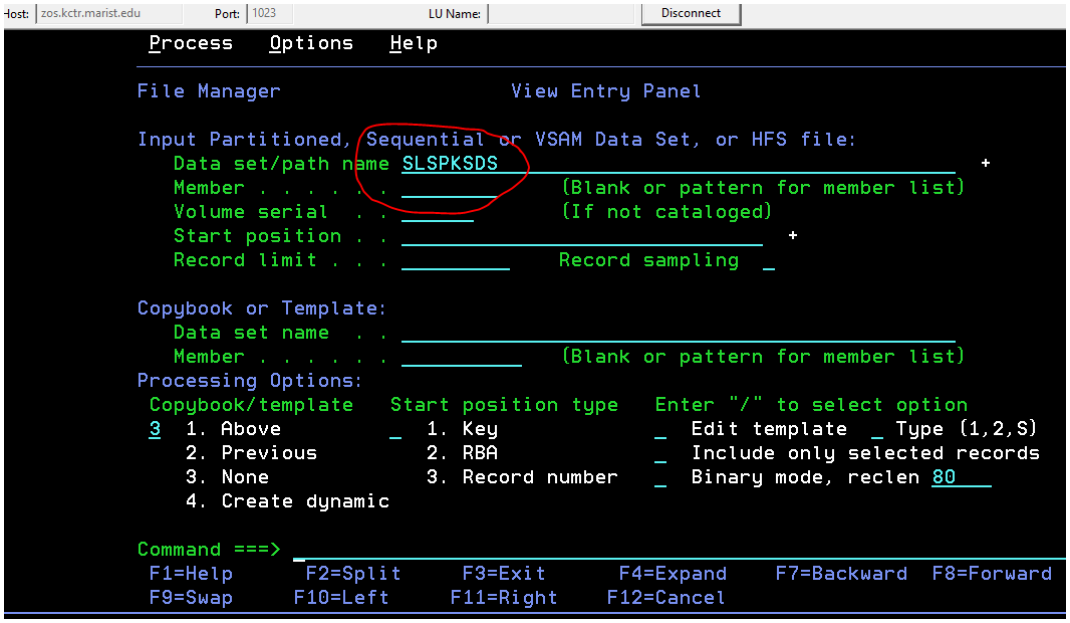
are

:

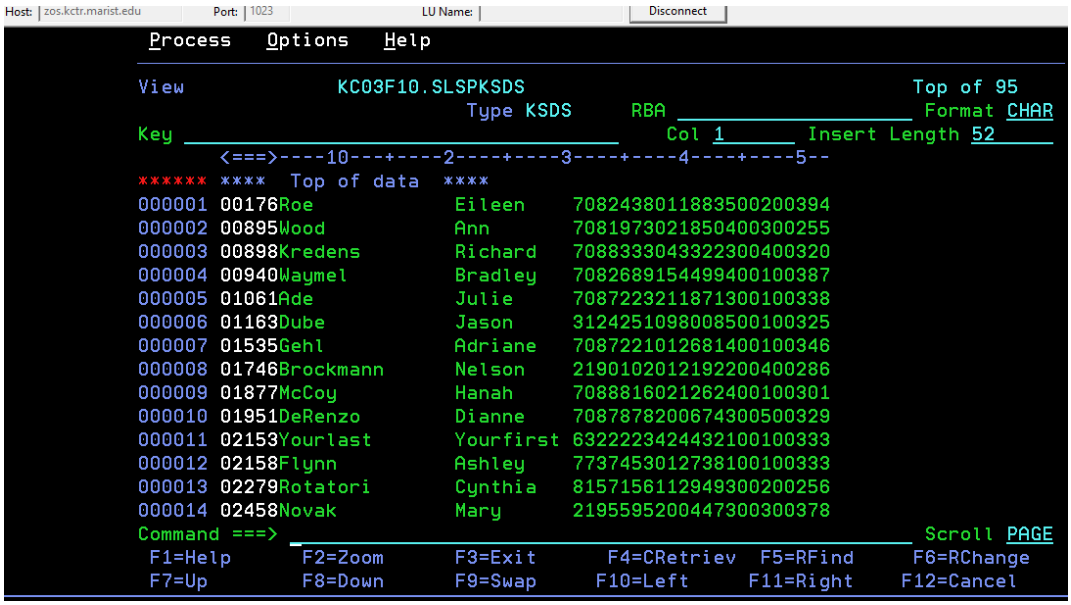


Option is F (FM is previous version of the File Manager Editor).





Eventually your screenshot will look like this (once we load the file with data ... for now it will not show any records ... (just Top of data and Bottom of data):



Notice the Key field is highlighted in white – this is the view once we add data to this file, which we will be doing shortly.

Make sure to capture / save a screen shot at this point as it is part of the lab today.

Note if you try to Delete/define this file while you are viewing this file in the FM editor, you will get an error!

You should now see a new entry in the IDZ Remote System Explorer for our new VSAM file with a little/tiny **red v** beside it. **Capture / save a screen shot of this too.**

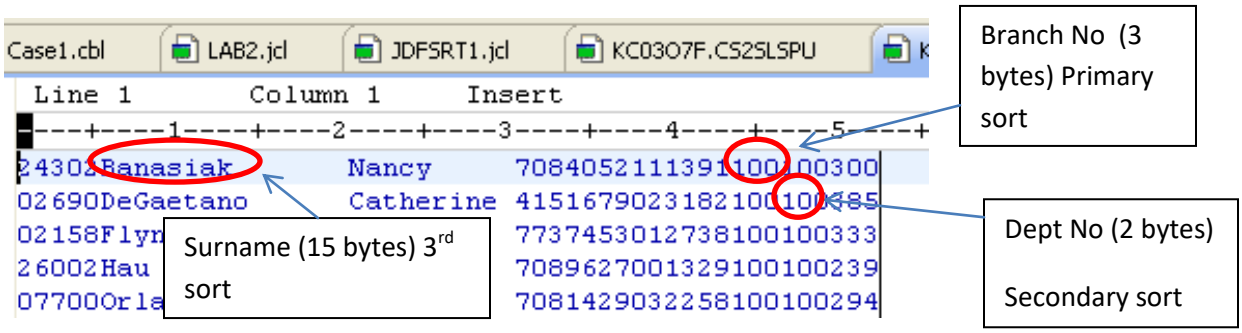
Lab 8 - 2%

- Create a new sequential file on the host called **CS2SLSPU** (case2 salesperson unsorted) and place the contents from the FOL file into it (remember to specify the correct Record Length)
- Edit the file and change Yourlast Yourfirst to your name
- Create another sequential file called **CS2SLSPS** (case2 salesperson sorted)
- Create a **NEW** JCL job that will sort CS2SLSPU to CS2SLSPS as follows:
  - Sorts on branch # as the primary sort field
  - Sorts on department # as a secondary sort field
  - Sorts on last name within department #, within branch # as the 3rd sort field
- To specify additional sort fields for secondary sort criteria, just add on to the same SYSIN command line:

Primary Start, Primary Length, Primary Type, Primary sequence, Secondary Start, Secondary Length, Secondary Type, Secondary Sequence…..

Submit

- **A screen shot of the newly sorted file showing your name**
- **A screen shot of the jcl you used**



If there are errors they will show up in the spooled output. We'll be using similar JCL in an upcoming class fyi.

- **Screen shot of online utility** defining SLSPKSDS **with return code of 0**
- **Screen shot of F (File Manager) view of the new (empty)** SLSPKSDS **file.**
- **Screen shot of Remote System** Explorer showing the tiny V for new VSAM file: