

# ***IBM Student Mainframe Challenge***

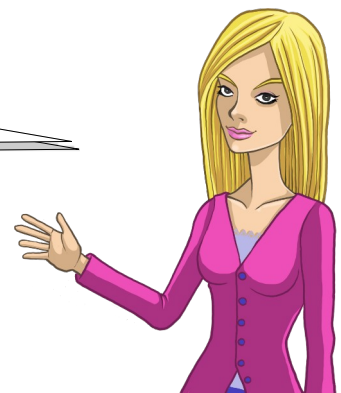
## ***Part One***

***Time to complete – about an hour***



Welcome to the Mainframe Challenge!  
You'll be joining our team of mainframe  
programmers to learn some skills  
then prove yourself above the other  
contestants! Good luck!

Hi, my name's Gemma. Welcome to the team!  
I've been here for a few months already, so  
I'll be able to offer some help and advice  
about using the mainframe,  
and about what the contest requires.



**The goal of Part One is to learn how to use an IBM System z mainframe without having used one before.**



I'll set some tasks and questions throughout the  
contest to see how you're getting on. There will  
also be prizes for the fastest contestants in each  
part (if you answer correctly, of course!)

Psst! The boss told me earlier what the  
prizes for each part will be...but you  
will need to check with your contest  
organiser to find out more!



So, you want to learn the mainframe? Become a whiz with z/OS? Make millions touting your desperately sought-after skills all over the world?

First things first, let's teach you how to log on to the mainframe. (Everyone has to start somewhere.)

Part One of the Mainframe Challenge covers the following tasks:

1. Logging on to the mainframe
2. Using TSO to:
  - a) view details of, and allocate a new dataset,
  - b) copy, read and modify a dataset member (equivalent to Windows folder file),
  - c) invoke a program from the TSO command entry panel,
  - d) transmit files to another user on another system.

## The software

In order to access the mainframe you'll need some software that will allow you to connect to it, and will be able to display the z/OS interface. We call it a *3270 terminal emulator* (snappy, huh?) - they are available for multiple platforms.

### If you're using Windows...

Go to <http://www.tombrennansoftware.com/download.html> and download the Vista V1.27.exe file. Install it by running the .exe file and following the installation instructions.

### If you're using a Mac...

Go to <http://brown.edu/cis/tn3270/> and install the latest available version.

### If you're using Linux...

You'll need to install the following package: x3270 -port1023 (available from <http://x3270.bgp.nu/>)

## After installation

Everyone got their emulator installed? Then let's begin...

The next step is to start it running. (Predictable, I know.) The default location after a Windows installation is Start → Programs → Vista tn3270 → Vista Standard session.

You might see this error:

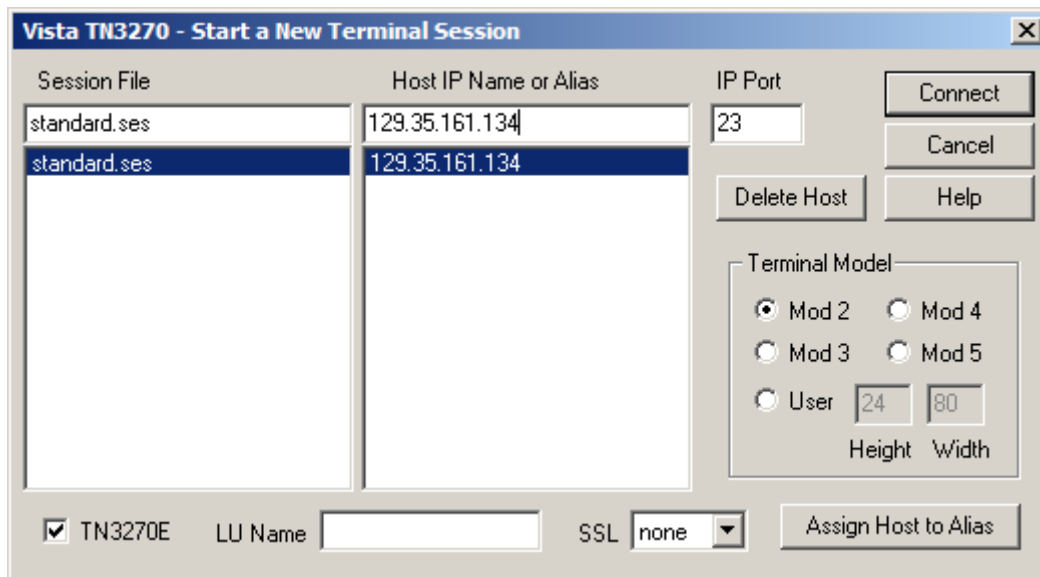


Don't worry about it, just continue. Now we can set up your emulator and connect to the mainframe.

## Configuration

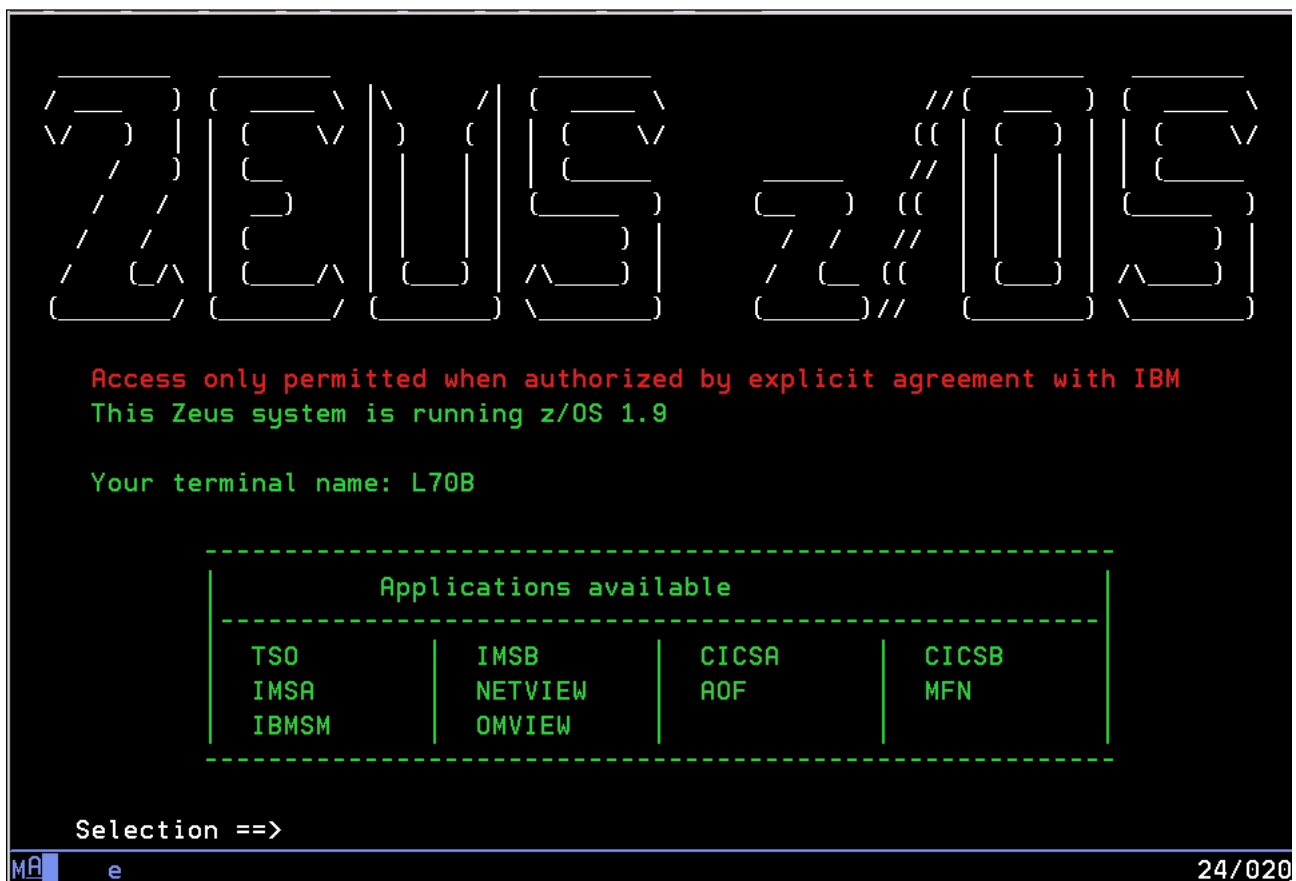
→ **Configure your emulator as shown below.**

(Windows users: from the menu bar in Vista Session A, select File → Reconnect Ask.)



The Host IP Name is **129.35.161.134** and the IP Port is **23**. These values point towards the z/OS system you'll be accessing.

→ **Fill in these two values, and click Connect.** If all is well, you should see this:



Congratulations, you have connected to the mainframe! Don't rest on your laurels yet, there's more to come.

## A z/OS primer

Now's a good time to give you some background information about z/OS, before you dive into it.

z/OS is an upgrade of what used to be called OS/390. Both of these operating systems are an evolution of MVS (which stands for Multiple Virtual Storage). General mainframe literature still contains many references to these terms. When you're connected to the mainframe, you will find that things are a bit different to what you are used to...

### A world where Ctrl == Enter

A number of keys on your keyboard don't have the same function as they would in your usual operating system. For example, the biggest one to remember is that to enter a command, you need to press **Ctrl**, not Enter! (That's the *right Ctrl* only, not the left one.)

In the z/OS world, the **Enter** key is a navigation control, and will move the cursor down to the next form field on the screen.

Many z/OS emulators allow you to use the **Enter** key to enter a command, so it won't matter if you forget - but the warning's there if you need it.

I've summarised the common differences below:

Action	Key on mainframe	Key on other O/Ss	Notes
Enter a command	<b>Ctrl</b>	Enter	
Scroll up one page	<b>F7</b>	Page Up	
Scroll down one page	<b>F8</b>	Page Down	
Exit current screen	<b>F3</b>	Esc	Esc is the closest equivalent, and not always used
Scroll left one screen	<b>F10</b>	(none)	Isn't that great? This is extra functionality only available on z/OS!
Scroll right one screen	<b>F11</b>		
Change to Insert mode	<b>Insert</b>	Insert	You get this one for free
Move cursor to next field	<b>Tab</b>	Tab	This one too
Move cursor to first field on next line	<b>Enter</b>	(none)	This is what will happen when you forget about <b>Ctrl</b> !

However, ultimately it depends on the emulator you're using. These are the common settings, you should be able to find out the mapping that your emulator uses if it's different.

Now that you know all that, let's put it into action by logging on...

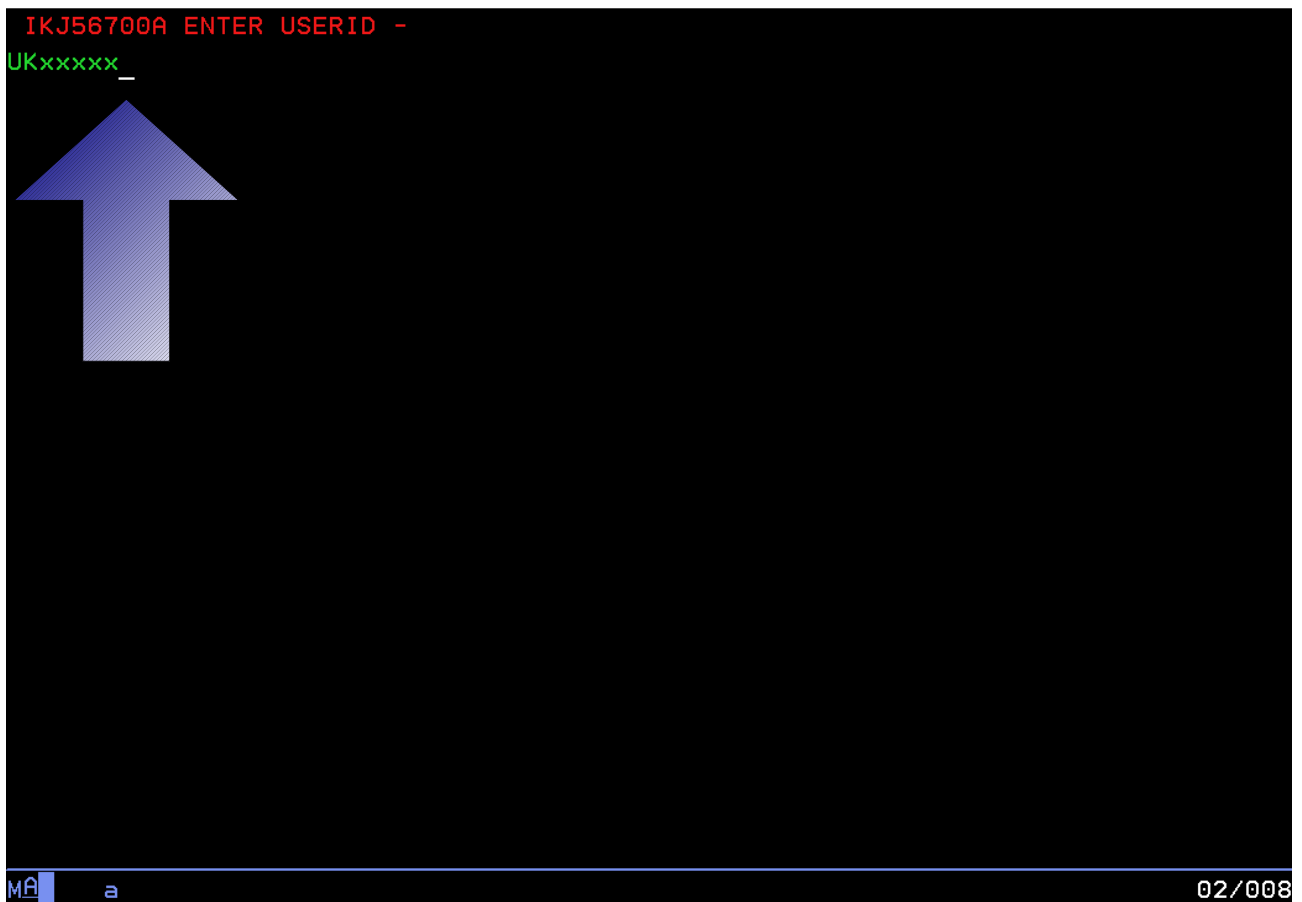
## Logging on

Remember where you were? The mainframe welcome screen?

You should have a cursor (looking like this: `_`) after a prompt (looking like this: `==>`) saying SELECT APPLICATION (looking like this: `SELECTION`).

→ **Type TSO at the prompt and enter.**

You will see a big black screen with a red message saying: `IKJ56700A ENTER USERID`. Much like this, in fact:



```
IKJ56700A ENTER USERID -
UKxxxxxx_
MA a 02/008
```

→ **Enter the user id that you have been allocated.**

For the UK contest it will be 7 characters long, and start with UK. From now on whenever I say UKxxxxxx, substitute your own user id. Now press **Enter**. (You know I mean **Ctrl**, right?)

You will be taken to this screen so that you can enter your password (which is the same as your user id the first time you log on):

→ **At the password prompt (`==>`) type in your user id and hit **Ctrl**.** You will be prompted to choose a new password.

```
----- TSO/E LOGON -----

Enter LOGON parameters below:

Userid    ==> UKxxxxxx
Password  ==> _
Procedure ==> SYSUSER
Acct Nmbr ==> UNIVER
Size      ==> 4096
Perform   ==>
Command   ==>

Enter an 'S' before each option desired below:
      -Nomail      -Nonotice      -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

MA  a 08/020
```

→ **Enter your new password twice** (followed by **Ctrl** each time).

At the bottom of the logon screen, there is a note to say you can press **PF1** or **PF13** for help. PF or "program function" is the old name for F or "function" keys. So, when there is an instruction to press (for example) **PF3**, the key you want is **F3** on your keyboard.

Passwords in z/OS have a maximum of 8 characters, but apart from that you can go nuts.



You will be taken to the ZEUS welcome screen:

```
ICH70001I UKxxxxx  LAST ACCESS AT xx:xx:xx ON TUESDAY, OCTOBER x, 20xx
IKJ56455I UKxxxxx  LOGON IN PROGRESS AT xx:xx:xx ON OCTOBER x, 20xx
IKJ56951I NO BROADCAST MESSAGES

LOGON PROC IS SYSUSER
ALLOCATING ISPF AND BASE DATASETS . . . . .

*****
*                               *
*           Welcome to IBM      *
*                               *
*       You are now entering the University      *
*                               *
*           z/OS V1R6 System    *
*                               *
* ----- *
* This system is only for use by Universities      *
* or for purposes authorized by IBM Management.    *
*****
INMR003I  ***** messages or data sets to receive.
***
_
```

MA a 16/006

(I know what you're thinking. Could be more welcoming, right?)

Notice at the bottom of the text you see this: \*\*\* The three asterisks mean that the system is waiting for your input to continue on its way, so press **Ctrl** to continue.

```
Menu Utilities Compilers Options Status Help

z/OS Primary Option Menu

0 Settings      Terminal and user parameters      User ID . . : UKxxxxxx
1 View          Display source data or listings      Time. . . : xx:xx
2 Edit          Create or change source data    Terminal. . : 3278
3 Utilities      Perform utility functions      Screen. . . : 1
4 Foreground     Interactive language processing      Language. . : ENGLISH
5 Batch          Submit job for language processing      Appl ID . . : ISR
6 Command        Enter TSO or Workstation commands      TSO logon . : SYSUSER
7 Dialog Test    Perform dialog testing      TSO prefix: UKxxxxxx
P IBM Products   IBM program products      System ID . : TESTMVS
                                     MVS acct. . : UNIVER
                                     Release . . : ISPF 5.6

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Option ==>
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA a 22/014
```

Ahh! This is what we've been waiting for!

This is ISPF. This is where the magic happens. This is your point of control.

(While we're on the subject of control, hit **Ctrl** to clear the copyright message out of the way.)

You are officially logged into a z/OS mainframe,  
and you've successfully completed the  
first three steps of Part One.

Congratulations!





## Customise your environment

In ISPF you can edit settings to make the environment your own. Let's try it out by moving the command line from the bottom of the screen to the top of the screen (this is what all the pro's do).

So, you've got your cursor on the command line. Enter **0** – this will take you through to the ISPF settings menu:

```
Log/List  Function keys  Colors  Environ  Workstation  Identifier  Help
ISPF Settings
Options                                         Print Graphics
Enter "/" to select option                    Family printer type 2
/ Command line at bottom                      Device name . . . .
/ Panel display CUA mode                      Aspect ratio . . . . 0
/ Long message in pop-up
/ Tab to action bar choices
- Tab to point-and-shoot fields
/ Restore TEST/TRACE options
- Session Manager mode
/ Jump from leader dots
- Edit PRINTDS Command
/ Always show split line
- Enable EURO sign

Member list options
Enter "/" to select option
/ Scroll member list
Command ==>
F1=Help    F2=Split    F3=Exit    F7=Backward  F8=Forward  F9=Swap
F10=Actions F12=Cancel

MA a 07/004
```

On this screen, practise navigating through the menu by pressing the **Tab** key repeatedly. You'll see the cursor moving through every field on the screen.

Tab Tab  
Tab Tab  
Tab Tab  
Tab  
Tab  
Tab Tab

Now try pressing the **Enter** key repeatedly. (Yes, I actually mean **Enter** this time!) You can see the cursor going to a new line each time, seeking out the first field on each line. (Don't worry if your emulator is set up differently.)

Enter  
Enter  
Enter

Navigate to the field (that looks like this: **/**) beside 'Command line at bottom'. Delete the '/' using the delete key and press enter (yeah, yeah, I mean **Ctrl**). See the command line jump to the top of the screen!

## Oh F3, we sing of thee

The **F3** key is another useful navigation command because it exits the screen you're in and goes to the previous screen, sort of like the Back button in an Internet browser. If you hit it twice from here...

...WAIT! Don't do that!

...you'll find yourself at the **TSO READY** prompt. (If this happens, just enter **ISPF** again.)

## Logging off

In fact, this is what you want to do when you want to log off; **F3** back to the **TSO READY** prompt and then type **logoff**.

```
READY
logoff _
```

A screenshot of a terminal window with a black background. At the top left, the word 'READY' is displayed in red. Below it, the word 'logoff' is entered in green, followed by a green underscore cursor. At the bottom left, there is a small status bar with 'MA' and 'a'. At the bottom right, the text '02/007' is displayed.

You should never just close the connection window without logging off properly, else you may find yourself locked out of your account!



When you want to log off, if you have done any extensive work during your session, you may be presented with a further screen (much like the one below):

```
Specify Disposition of Log Data Set
Command ==> _____ More: +
Log Data Set (UKxxxxx.SPFLOG1.LIST) Disposition:
Process Option . . . . 2 1. Print data set and delete
                          2. Delete data set without printing
                          3. Keep data set - Same
                          (allocate same data set in next session)
                          4. Keep data set - New
                          (allocate new data set in next session)
Batch SYSOUT class . . . _____
Local printer ID or
writer-name . . . . . _____
Local SYSOUT class . . . _____

List Data Set Options not available

Press ENTER key to complete ISPF termination.
Enter END command to return to the primary option menu.

Job statement information: (Required for system printer)
==> _____
F1=Help      F2=Split    F3=Exit      F7=Backward  F8=Forward   F9=Swap
F12=Cancel

MA a 05/025
```

If you come across this screen, select Option 2 ("Delete data set without printing") and press enter. *Then* you can log off as described above.

If you get locked out of your user id,  
maybe because your session was cut off  
unexpectedly, wait 10 minutes for the system  
to drop the user id, and then try again.

If you are still having problems, please e-mail  
your contest admin ID who can help  
fix your problem...  
or at least find someone who can!



# CREATING A NEW DATASET

As a logged-on user on the mainframe you have allocated storage, equivalent to Unix quotas, where you can create *datasets* (equivalent to Windows folders) to store *dataset members* (equivalent to Windows files).

In this part of the Mainframe Challenge you will specify for each electrical appliance within your student house how many of each there are, and on average how long they are on for. The target of this part of the challenge is to set up your appliance data dataset member so that the daily consumption falls within a target range.

## 2.1 Allocate a new dataset

You will create a new dataset based upon the characteristics of an existing dataset. You can then copy in the template appliance data dataset member to your new dataset.



First, we need to know what characteristics our new dataset will have. One way to achieve this is by locating the dataset that we want to copy members from and asking for its allocation information.

- **Go to the main menu within ISPF (use F3 to return there)**
- **Select option 3 (by typing 3 and pressing Enter) to enter the Utility Selection Panel.**

Have a look through the options available. You should see that option 4 allows you to list datasets.

- **Select this option by typing 4 and pressing Enter.**

You are now in ISPF utility 3.4.

```

Menu  RefList  RefMode  Utilities  Help

                                Data Set List Utility
                                More:      +

blank Display data set list      P Print data set list
  V Display VTOC information      PV Print VTOC information

Enter one or both of the parameters below:
Dsname Level . . . _____
Volume serial . . . _____

Data set list options
Initial View                      Enter "/" to select option
 1 1. Volume                      / Confirm Data Set Delete
 2 Space                          / Confirm Member Delete
 3 Attrib                         / Include Additional Qualifiers
 4 Total                          / Display Catalog Name
                                / Display Total Tracks

When the data set list is displayed, enter either:
"/" on the data set list command field for the command prompt pop-up,
Option ==> _____
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA  A 22/014

```

Illustration 1: ISPF utility 3.4 - Data Set List Utility

→ In the Dsname Level field type **ZOS.CONTEST2.PART1.DATA** and then press **Enter**

A list of one dataset will appear, matching the name specified. In the Command column, ask for the dataset's allocation information by specifying **i** in that column, as shown in Illustration 2 and then press **Enter**.

```

Menu  Options  View  Utilities  Compilers  Help

DSLIST - Data Sets Matching ZOS.CONTEST2.PART1.DATA      Row 1 of 1
Command - Enter "/" to select action      Message      Volume
-----
i      ZOS.CONTEST2.PART1.DATA      DMTP13
***** End of Data Set list *****

Command ==> _____ Scroll ==> PAGE
F1=Help      F2=Split      F3=Exit      F5=Rfind      F7=Up      F8=Down      F9=Swap
F10=Left     F11=Right     F12=Cancel

MA  A 07/003

```

Illustration 2: Data Set List - Obtaining allocation information

What follows is shown in Illustration 3; there are many pieces of information that can be used to recreate a similar dataset. By viewing these details, z/OS will remember them so that they can be used as default values during the allocation of a new dataset. Have a look at the details and you can see its type: PDS; its record format: VB=Variable Block; volume serial: DMTP13; and lots of other useful information.

```

Data Set Information

Data Set Name . . . . : ZOS.CONTEST2.PART1.DATA

General Data
Management class . . : STANDARD
Storage class . . . : BASE
Volume serial . . . : DMTP13
Device type . . . . : 3390
Data class . . . . . : **None**
Organization . . . . : PO
Record format . . . : VB
Record length . . . : 32756
Block size . . . . . : 32760
1st extent bytes . . : 131040
Secondary bytes . . : 65520
Data set name type : PDS

Current Allocation
Allocated bytes . . : 131,040
Allocated extents . : 1
Maximum dir. blocks : 10

Current Utilization
Used bytes . . . . . : 32,760
Used extents . . . . : 1
Used dir. blocks . . : 1
Number of members . : 1

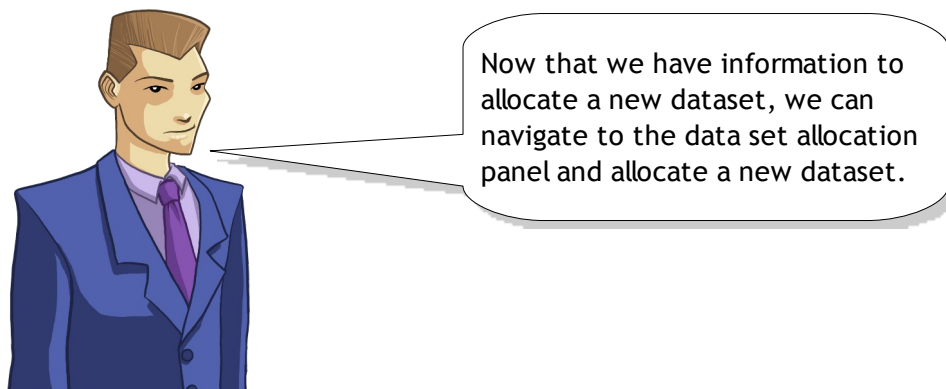
Creation date . . . : 2011/09/30
Expiration date . . : ***None***

Command ==>
F1=Help      F2=Split    F3=Exit      F7=Backward  F8=Forward   F9=Swap
F12=Cancel

MA  A 22/015

```

Illustration 3: Data Set Information



- From the main menu within ISPF (use **F3** to return there), select option **3** and press **Enter** to enter the Utility Selection Panel.

Looking through the options available to you, you will see that option 2 allows you to allocate a new dataset.

- Type in **2** and press **Enter**.

You are now in ISPF utility 3.2, as shown in Illustration 4.

```

Menu  RefList  Utilities  Help

                                Data Set Utility

    A Allocate new data set          C Catalog data set
    R Rename entire data set        U Uncatalog data set
    D Delete entire data set        S Short data set information
blank Data set information          V VSAM Utilities

ISPF Library:
  Project . . . _____      Enter "/" to select option
  Group  . . . _____      / Confirm Data Set Delete
  Type   . . . _____

Other Partitioned, Sequential or VSAM Data Set:
  Name . . . . . _____
  Volume Serial . . . _____ (If not cataloged, required for option "C")

Data Set Password . . . (If password protected)

Option ==> _____
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA  A 22/014

```

Illustration 4: ISPF utility 3.2 - Data Set Utility

In the ISPF Library section the Project, Group and Type fields will specify the new dataset name, where:

- Project will be the same as your User ID (referred to as <user> later in this section) that you used to log on to ZEUS,
- Group is a name that you will recognise to aid grouping of files, e.g. CHALLENGE,
- Type is a name that you will recognise to classify the type of files within a dataset, e.g. DATA.

Each field can be up to 8 characters in length.

- ➔ **Specify the name of your dataset using the fields above.**
- ➔ **On the Option line type **A** and press **Enter**.**

You are now presented, as shown in Illustration 5, with a panel that has allocation information filled in, based upon the previous dataset that you viewed.

```

Menu  RefList  Utilities  Help

Allocate New Data Set

Data Set Name . . . : UKxxxxx.CHALLENGE.DATA

Management class . . . STANDARD (Blank for default management class)
Storage class . . . . BASE (Blank for default storage class)
Volume serial . . . . DMTP13 (Blank for system default volume) **
Device type . . . . (Generic unit or device address) **
Data class . . . . (Blank for default data class)
Space units . . . . BYTE (BLKS, TRKS, CYLS, KB, MB, BYTES
or RECORDS)
Average record unit _ (M, K, or U)
Primary quantity . . 131040 (In above units)
Secondary quantity . 65520 (In above units)
Directory blocks . . 10 (Zero for sequential data set) *
Record format . . . . VB
Record length . . . . 32756
Block size . . . . . 32760
Data set name type . PDS (LIBRARY, HFS, PDS, LARGE, BASIC, *
Command ==>
F1=Help F2=Split F3=Exit F7=Backward F8=Forward F9=Swap
F10=Actions F12=Cancel
MA A 22/015

```

Illustration 5: Allocate New Data Set - with prefilled details

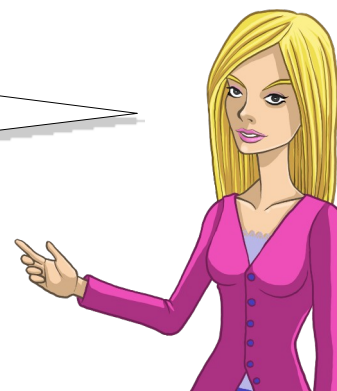
Press **Enter** again and your dataset will be allocated. The message 'Data set allocated' will be presented on the page shown in Illustration 4.

## 2.2 Copying house appliance data into your new dataset

We will be using an energy consumption calculation program to analyse raw data that show the energy usage of the house appliances. To get to the point where we can invoke the energy consumption calculation program, we need some input data which we can modify between each invocation of the program.

There is a data set utility which can copy dataset members from one dataset into another. This utility is option 3.3 from the main ISPF menu panel.

Have a look below at the two main ways to get to that utility!



1. Press **F3** until you get back to the main ISPF menu panel, then type in **3** and press **Enter** followed by typing **3** and pressing **Enter** again,
2. Type **=3.3** into the Command field and press **Enter**

When you are in utility 3.3 you will be presented with the page as shown in Illustration 6.



```

Menu  RefList  Utilities  Help

                                Move/Copy Utility

C   Copy data set or member(s)      CP Copy and print
M   Move data set or member(s)     MP Move and print

Specify "From" Data Set below, then press Enter key

From ISPF Library:
  Project . . . _____ (--- Options C and CP only ---)
  Group . . . _____ . . . _____ . . . _____
  Type . . . _____
  Member . . . _____ (Blank or pattern for member list,
                          "*" for all members)

From Other Partitioned or Sequential Data Set:
  Name . . . _____
  Volume Serial . . . _____ (If not cataloged)

Data Set Password . . . _____ (If password protected)
Option ==> _____
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA  A 22/014

```

Illustration 6: ISPF utility 3.3 - Move/Copy Utility

From this panel you can copy the house appliance data which you will eventually edit when it is in your new dataset.

- In the Name field of the From Other Partitioned or Sequential Data Set section of the page type: **'ZOS.CONTEST2.PART1.DATA(HOUSE)'**

Notice that you need to prefix and suffix the dataset and member name with single quotes!



- Then, in the Option field type **c** and press **Enter**.

We have now selected what we are going to copy, now we need to specify where it is going to be placed.

- Within the To ISPF Library section of the next page, specify your new dataset in the Project, Group and Type fields.

Leave the Member field blank so that it will use the same name; as demonstrated in Illustration 7. Then press **Enter**.

```

Menu  RefList  Utilities  Help
COPY      From ZOS.CONTEST2.PART1.DATA(HOUSE)
More:      +

Specify "To" Data Set Below

To ISPF Library:          Options:
Project   . . . UKxxxxx   Enter "/" to select option
Group     . . . CHALLENGE  _  Replace like-named members
Type      . . . DATA      /  Process member aliases
Member    . . .           (Blank unless member is to be renamed)

To Other Partitioned or Sequential Data Set:
Name      . . .           (If not cataloged)
Volume Serial . . .           (If password protected)

Data Set Password . . .

To Data Set Options:
Sequential Disposition      Pack Option      SCLM Setting
Command ==>
F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA  A 10/022

```

Illustration 7: Copying the HOUSE dataset member

The message Member HOUSE copied will be presented on the page shown in Illustration 6.

## 2.3 Invoking the house consumption calculation program

We now have an input file that we can use as input to our house consumption calculation program. There are various ways to invoke a program within TSO, one of which is to 'call' it from within ISPF option 6. Let us do just that.

In the Option or Command field on the page that you are on type =6 and press **Enter**.

You will be presented with a command input panel which looks like that shown in Illustration 8.

```

Menu  List  Mode  Functions  Utilities  Help
ISPF Command Shell
Enter TSO or Workstation commands below:

==>

Place cursor on choice and press enter to Retrieve command

=>
=>
=>
=>
=>
=>
=>
=>
=>
=>

F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel

MA  A 06/007

```

Illustration 8: ISPF option 6 - ISPF Command Shell

On the command line (after the `==>` text) type in the following command then press **Enter**:  
`call 'ZOS.CONTEST2.PART1.LOAD(ANALYSE)' 'HOUSE=<user>.CHALLENGE.DATA(HOUSE)'`  
where `<user>` is your ZEUS user ID.

The output from this program invocation will be presented directly on to the screen. If you are presented with '\*\*\*' at the end of the screen then press **Enter** to move to the next screen.

If you enter this command incorrectly you are likely to encounter the message 'IKJ56718A REENTER THIS OPERAND+'. If you do, ensure that zOS is waiting for your input and there is not any more output (indicated by the '\*\*\*' at the end of the screen) and issue the attention command: either right-click and select 'PA1' or press 'Esc'.

What you have just done is invoke a pre-compiled program, where the LOAD module (the executable) is stored in ZOS.CONTEST2.PART1.LOAD, and you passed a parameter to the program so that it knows which input file to read.



The output given will show you the data read from the file and will have calculated the consumption of your virtual house. It will indicate whether you are within the appropriate target range (as indicated in the output); the last line of the output will indicate whether or not you are within the target range.

#### Sample output:

```
Welcome to the IBM Mainframe Challenge
---
Obtaining consuming appliances in the HOUSE ...
Base : 100 W
Target is 8000 Wh
Error +/-: 10 %

Television:1 90 mins
Computer:1 120 mins
Games console:2 75 mins
Economy light:3 60 mins
Economy light:1 240 mins
Washing machine:1 70 mins
Dishwasher:1 75 mins
Charger:1 60 mins
Power shower:1 10 mins

Result
---
Target = 8.000 kWh. Actual = 6.514 kWh.
Error target = 10%, actual = -18%
*** TRY AGAIN ***
***
```

## 2.4 Editing a dataset member

In order to produce a successful outcome when invoking the program as described in Step 2.4, you must modify the input file.



There are various appliances that you can include and exclude in the house data file, but you must have at least one appliance from each of the categories below.

Category	Appliance
1	Television
1	Computer
1	Games console
2	Economy light
2	Incandescent light
3	Tumble dryer
3	Washing machine
3	Dishwasher
4	Charger
4	Power shower

*Table 1: Appliance data*

To edit a dataset you must navigate to ISPF utility 3.4.

From the main menu within ISPF (use **F3** to return there), type in **3** and press **Enter** to enter the Utility Selection Panel.

Looking through the options available to you you will see that option 4 will give you the option to list datasets. Type **4** and press **Enter**. You are now in ISPF utility 3.4.

In the Dsname Level field type **<user>.CHALLENGE.DATA** and then press **Enter**. What will appear is a list of one dataset matching the name specified.

In the command column ask to edit members in the dataset by specifying **e** in the Command column, and then press **Enter**.

You will now be presented with the list of members available within that dataset. Tab down to the line which has the HOUSE member on it and edit that member by specifying **e** to the left of the member as

represented in Illustration 9. Edit the member by pressing **Enter**.

```
Menu  Functions  Confirm  Utilities  Help
EDIT                                     Row 00001 of 00001
e_____ Name      UKxxxxx.CHALLENGE.DATA      Prompt      Size      Created      Changed      ID
                HOUSE      20      2011/07/01      2011/09/20 10:32:40      ISHORE
                **End**

Command ==> _____ Scroll ==> PAGE
F1=Help      F2=Split      F3=Exit      F5=Rfind      F7=Up      F8=Down      F9=Swap
F10=Left      F11=Right      F12=Cancel

MA  A 05/003
```

*Illustration 9: ISPF utility 3.4 - editing a dataset member*

You will now be within an editing session where you can update the dataset member. There are many commands and actions that you can now use to edit this member but the main ones that you will need are:

Use **F3** to save the file and exit.

Use **F12** to exit the file without saving.

Use **F7** and **F8** to page up and down respectively.

Use **F10** and **F11** to scroll left and right on the screen.

Over-type text on lines to change the text.

Commands can be typed (and **Enter** pressed) in the line number column on the left:

- **d** – will delete a line
- **i** – will insert a new line

Lines can be added but ignored by the program by starting them with a **#** character.

➔ **When you have modified the dataset member, repeat Step 2.3.**

If you are successful then you can continue to Step 2.5 to transmit the resulting dataset to the Mainframe Challenge administrator.

## 2.5 - Transmit the results dataset

Upon successful completion of Part 1 a new dataset will be created that must be transmitted to the Mainframe Challenge administrator. The created dataset will be named `<user>.<user>.RESULT`.

To transmit this dataset return to the ISPF Command Shell (ISPF utility 6), as described in Step 2.3, and type in the following command:

```
xmit ZOS19.MATTK dsn('<user>.<user>.RESULT')
```

where `<user>` is your ZEUS user ID.

Congratulations – you have now  
completed Part One!

