REXX Programming

Duration: 3 Days (may be longer with any of the appendices)

Audience:

Delegates may be new to REXX, or have some exposure to REXX but need to underpin their experience by formal training.

Pre-requisites:

An understanding of computer concepts is assumed.

A working knowledge of TSO/ISPF is required. This can be gained from our z/OS TSO/ISPF Workshop.

Course Objectives

Each delegate will acquire a working knowledge of REXX in the z/OS TSO/E environment. Good programming practice is encouraged throughout. The course starts with the basics and furthers learning with 30 hands on exercises.

Course Content

Module 1: TSO/E REXX Environment

REXX Platforms
What is REXX?
Where is REXX code held?
How is REXX invoked?
REXX in batch; IKJEFT01 and IRXJCL

Module 2: Structure and Syntax

What constitutes REXX code?
Changing default environments; ADDRESS instruction
The coding rules described
Definition of variables
STEM variables and the DROP instruction
Operator characters; Arithmetic, Logical, Comparison and Concatenation
Operator order of precedence

Module 3: Diagnostic Aids

Checking logic flow; SAY instruction
Immediate commands; HE, HI, HT, RT, TE and TS
Trapping errors; CALL and SIGNAL instructions

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Analyzing instruction execution; TRACE instruction and EXECUTIL command

Module 4: File Processing

File processing overview
Making data sets available; TSO ALLOC command
Disposing of data sets; TSO FREE command
Read or Write a data set; EXECIO command
I/O data areas; STEM and Data Stack

Module 5: Control Instructions

Basic decision making; IF and ELSE instructions
Case statements; SELECT, WHEN and OTHERWISE instructions
Iterative and conditional processing; DO instruction
Iterative processing logic
Bypassing iterative instructions; ITERATE instruction
Terminating iteration; LEAVE instruction

Module 6: Parsing

What is Parsing?
PARSE instruction general syntax
Read from keyboard or Data Stack; PARSE PULL
Read from a Variable; PARSE VAR
Process the results of an expression; PARSE VALUE
Handling excess data generated by PARSE
INTERPRET instruction

Module 7: Sub-routines and Functions

Naming internal sub-routines
Invoking internal sub-routines; CALL instruction
Hiding variables from a sub-routine; PROCEDURE instruction
Sharing hidden variables; EXPOSE instruction
Invoking external sub-routines; CALL instruction
Accessing passed variable data; PARSE ARG instruction and the ARG Built-in Function
Returning data to the caller; EXIT and RETURN instructions
The difference between a sub-routine and a Function

Module 8: REXX Built-in Functions

Conversion functions; C2D, C2X, D2C, D2X, X2B, X2C and X2D

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Acquire date and time; DATE and TIME functions
Format a string; CENTRE, LEFT, RIGHT, SPACE, STRIP and TRANSLATE functions
Determine the size of a string; LENGTH, WORDLENGTH, and WORDS functions
Locate the position of something; FIND, POS, and WORD functions
Validating content; COMPARE, DATATYPE and VERIFY functions
Duplicate something; COPIES function
Shorten a string; DELSTR, DELWORD, AUBSTR and SUBWORD functions
Obtain session user identity; USERID function
Expand a string; INSERT function
Get highest/lowest value in a range; MAX and MIN functions
TSO/E functions; LISTDSI, MSG and PROMPT

Module 9: Data Stack Management

What is the Data Stack?
Add data to the stack; PUSH and QUEUE instructions
Read from the Data Stack; PARSE PULL
Stack management; DELSTACK, DROPBUF, NEWSTACK, QBUF, QELEM, and QSTACK Commands and the QUEUED Built-in Function
Some possible Data Stack uses

Module 10: Commands and Output Capture

Execute a non-REXX program; TSO/E CALL command
Delete a data set or member; TSO/E DELETE command
List the member of a PDS(E); TSO/E LISTDS command
Trapping command output; OUTTRAP Built-in Function

Module 11: LINK Environments

An alternative to TSO/E CALL; LINK Environment
Pass and receive fixed length data; LINKPGM Environment
Pass and receive data of amended length; LINKMVS Environment
Search order for all LINK environments
Return Codes from LINKPGM and LINKMVS

Appendix A: REXX with DB2 and SQL

Ensuring DB2 is available; SUBCOM command and RXSUBCOM Built-in Function
Making DB2 the default environment; ADDRESS DSNREXX instruction
Connecting to DB2; DSNREXX “CONNECT”
Prohibited SQL statements
SQL statement rules

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Using variable
Cursor and Statement naming
The difference between DB2 and REXX variables
Error handling
DB2 Command interface; -DIS and -TERM commands

Appendix B: ISPF Overview

ISPF structure
Libraries and data sets
Assigning alternative libraries; LIBDEF Command
Checking library status; ISPLIBD Command
ISPF Services; Browse, Control, Display, Edit, Select, Vget, Vput and View
Establishing default libraries via TSO LOGON procedure
Starting ISPF; ISPSTART Command
Diagnostic aids
ISPF in Batch

Appendix C: Interacting with z/OS and JES2

Add/Delete SDSF Environment
Issuing SDSF primary commands; ISFEXEC instruction
Special panel commands and variable
Using the WHO and QUERY commands
Various Return Codes
Issuing SDSF line commands; ISFACT instruction
The SPOOL variables
Capturing JES2 SPOOL output to a data set
Issuing z/OS commands; ISFSLASH and its variables

Appendix D: Accessing z/OS UNIX System Services

Checking UNIX access; SYSCALLS Built-in Function
Awareness of variable isolation
Permission bit settings
Creating and reading a z/OS UNIX System Services file
Alternatives to readfile and writefile; EXECIO instruction
z/OS UNIX System Service file allocation using TSO ALLOC