

Tutorial 13

REXX Scripting Language

PHP, Python (popular with Linux users), Perl and Tcl/Tk are widely used Scripting Languages. REXX is the Scripting Language favoured by IBM. It is available on all IBM operating system platforms. A large number of both open source/public domain and of commercial versions are also available for just about any existing platform. E.g., Microsoft has for many years been distributing a REXX Interpreter as part of their SDKs .

Besides JCL, REXX is widely used under z/OS and OS/390. There is another TSO scripting language "CLIST" which is not as popular as REXX. This tutorial walks you through the generation and execution of a simple REXX program.

For me, scripting languages like REXX, PHP, Python, Perl and Tcl/Tk are all very similar (yes, the fanatics will disagree). If you know one, you know them all. If you are interested, you can write lengthy CICS transactions using REXX, and some people have done so.

The American National Standard (ANSI Standard) for REXX is called

"Programming Language - REXX" ;

its number is X3.274-1996.

The REXX Language Association (RexxLA) is an independent organization dedicated to promoting the use and understanding of the REXX programming language. Visit <http://www.rexxla.org/> .

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Menu  Utilities  Compilers  Options  Status  Help
-----
                          ISPF Primary Option Menu

0  Settings      Terminal and user parameters      User ID . . : PRAKT20
1  View          Display source data or listings   Time. . . . : 10:12
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 . . : PDF
6  Command      Enter TSO or Workstation commands TSO logon  : IKJACCNT
7  Dialog Test  Perform dialog testing           TSO prefix: PRAKT20
8  LM Facility  Library administrator functions  System ID  : DAVI
9  IBM Products IBM program development products MVS acct.  : ACCT#
E-----N r      Release . . : ISPF 4.5
e Licensed Materials - Property of IBM e
e 5647-A01 (C) Copyright IBM Corp. 1980, 1997. e
e All rights reserved. e
e US Government Users Restricted Rights - e s
e Use, duplication or disclosure restricted e
e by GSA ADP Schedule Contract with IBM Corp. e
D-----M
Option ==> 3
F1=Help      F3=Exit      F10=Actions  F12=Cancel

```

Starting from the ISPF Primary Option Menu we allocate a Partitioned Data Set to store our REXX Scripts.

Enter .

```

Menu  Help
-----
                          Utility Selection Panel

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, copy, or promote 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  Download    Download ISPF C/S, VA for ISPF, transfer map, or data set.
8  Outlist     Display, delete, or print held job output
9  Commands    Create/change an application command table
*  Reserved    This option reserved for future expansion.
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      F3=Exit      F10=Actions  F12=Cancel

```

Enter

Menu RefList Utilities Help

Data Set Utility

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

ISPF Library:

Project . . . PRAKT20
Group . . . REXX
Type . . . EXEC

Other Partitioned, Sequential or VSAM Data Set:

Data Set Name . . .
Volume Serial . . . (If not cataloged, required for option "C")
Data Set Password . . . (If password protected)

Option ==> A

F1=Help F3=Exit F10=Actions F12=Cancel

We name the new PDS „PRAKT20.REXX.EXEC“ . Allocate, Enter

Menu RefList Utilities Help

Allocate New Data Set

Data Set Name . . . : PRAKT20.REXX.EXEC More: +
Management class . . . DEFAULT (Blank for default management class)
Storage class . . . PRIM90 (Blank for default storage class)
Volume serial . . . SMS001 (Blank for system default volume) **
Device type (Generic unit or device address) **
Data class (Blank for default data class)
Space units MEGABYTE (BLKS, TRKS, CYLS, KB, MB, BYTES
or RECORDS)
Average record unit (M, K, or U)
Primary quantity . . 2 (In above units)
Secondary quantity . 1 (In above units)
Directory blocks . . 5 (Zero for sequential data set) *
Record format . . . FB
Record length . . . 80
Block size 11440
Data set name type : PDS (LIBRARY, HFS, PDS, or blank) *
(YY/MM/DD, YYYY/MM/DD)

Command ==>

F1=Help F3=Exit F10=Actions F12=Cancel

Select the usual parameters for a Partitioned Data set .

Press F3 key 3 times .

Menu Utilities Compilers Options Status Help

ISPF Primary Option Menu

0	Settings	Terminal and user parameters	User ID . . : PRAKT20
1	View	Display source data or listings	Time. . . : 10:21
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 . : PDF
6	Command	Enter TSO or Workstation commands	TSO logon : IKJACCNT
7	Dialog Test	Perform dialog testing	TSO prefix: PRAKT20
8	LM Facility	Library administrator functions	System ID : DAVI
9	IBM Products	IBM program development products	MVS acct. : ACCT#
10	SCLM	SW Configuration Library Manager	Release . : ISPF 4.5
11	Workplace	ISPF Object/Action Workplace	

Enter X to Terminate using log/list defaults

Option ==> 2

F1=Help F3=Exit F10=Actions F12=Cancel

Call the ISPF editor to write the REXX Program.

Enter

Menu RefList RefMode Utilities LMF Workstation Help

Edit Entry Panel

ISPF Library:

Project . . . PRAKT20
Group . . . REXX
Type . . . EXEC
Member . . . HALLOAA (Blank or pattern for member selection list)

Other Partitioned or Sequential Data Set:

Data Set Name . . .
Volume Serial . . . (If not cataloged)

Workstation File:

File Name

Options

Initial Macro / Confirm Cancel/Move/Replace
Profile Name Mixed Mode
Format Name Edit on Workstation
Data Set Password . . Preserve VB record length

Command ==>

F1=Help F3=Exit F10=Actions F12=Cancel

We write our REXX Program into the Member HALLOAA

Menu Utilities Compilers Options Status Help

ISPF Primary Option Menu

0	Settings	Terminal and user parameters	User ID . . : PRAKT20
1	View	Display source data or listings	Time. . . : 10:35
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 . : PDF
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10	SCLM	SW Configuration Library Manager	Release . : ISPF 4.5
11	Workplace	ISPF Object/Action Workplace	

Enter X to Terminate using log/list defaults

Option ==> TSO EXEC REXX.EXEC(HALLOAA) EXEC
F1=Help F3=Exit F10=Actions F12=Cancel

Back to the ISPF Primary Option Menu . Enter the command

"TSO EXEC REXX.EXEC(HALLOAA) EXEC"

Press Enter

Menu Utilities Compilers Options Status Help

ISPF Primary Option Menu

0	Settings	Terminal and user parameters	User ID . . : PRAKT20
1	View	Display source data or listings	Time. . . : 10:35
2	Edit	Create or change source data	Terminal. : 3278
3	Utilities	Perform utility functions	Screen. . : 1
4	Foreground	Interactive language processing	Language. : ENGLISH
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10	SCLM	SW Configuration Library Manager	Release . : ISPF 4.5
11	Workplace	ISPF Object/Action Workplace	

Enter X to Terminate using log/list defaults

Hallo Welt

This is the result. Simple, isn't it ?

REXX permits you to do many things. The following code sample calculates a fraction

```
File Edit Confirm Menu Utilities Compilers Test Help
-----S
EDIT          PRAKT20.REXX.EXEC(MEXEC) - 01.00          Columns 00001 00072
***** ***** Top of Data *****
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 /*****REXX*****/
000002 /*      EXEC for the division of two numbers      */
000003 /*****/
000004 say 'first number : '
000005 pull z
000006 say 'second number : '
000007 pull n
000008 if n=0 then say 'Division by zero not permitted'
000009 else do
000010     say z 'divided by' n 'is' z/n
000011     say 'or'
000012     say z 'divided by ' n 'is' z%n 'remainder' z//n
000013 end
***** ***** Bottom of Data *****

Command ==>          Scroll ==> PAGE
F1=Help      F3=Exit      F5=Rfind      F6=Rchange  F12=Cancel
```

You may store this code in another member besides HALLOAA , and give it any name. Execute it like before. If you do not need the data any longer, erase the dataset using the same menu you used to generate it:

To delete a dataset proceed as follows : ISPF Primary Options Menu -> (3) Utility Selection Panel -> (2) Dataset Utility, then mark the dataset to be erased with a „D“ (Delete entire data set).

That's it. Congratulations, you are now an expert REXX programmer.

To dig deeper - additional Literature

Internet

REXX Language page at IBM Hursley
<http://www2.hursley.ibm.com/rexx/>

Einfaches REXX Tutorial
http://users.comlab.ox.ac.uk/ian.collier/Docs/rexx_info/whole.html

Introductory REXX Tutorial
http://www.rexxla.org/About_Rexx/rexxtut.html

REXX Tutorial
<http://users.comlab.ox.ac.uk/ian.collier/Rexx/info.html>

Introductory REXX Tutorial
http://www.rexxla.org/About_Rexx/rexxtut.html

IBM Manuals

- SC28-1882 TSO/E V2R1.1 REXX User's Guide
- SC28-1883 TSO/E Version 2 REXX/MVS Reference
- SC23-3803 Using REXX to Access OpenEdition MVS Services
- | SC31-8231 TME 10 NetView for OS/390 V1R2 Customization: Using REXX
- | SC28-1905 OS/390 Using REXX and OS/390 UNIX System Services
- | SC28-1975 OS/390 V2R10.0 TSO/E REXX Reference
- | SC28-1974 OS/390 V2R9.0-R10.0 TSO/E REXX User's Guide
- ZB35-5100 The REXX Language, 2nd Ed. -- Cowlshaw (see below)
- SC26-4358 SAA CPI: Procedures Language Reference (Level 1)
- SC24-5549 SAA CPI: REXX Level 2 Reference
- G511-1430 IBM REXX Compiler and Library/370: Introducing the Next Step in REXX
- SH19-8160 REXX/370 (Compiler and Library/370): User's Guide and Reference
- SK2T1402 REXX/370 Compiler and Library V1R2.0 Online Product Library
- LY19-6264 IBM REXX Compiler and Library/370: Diagnosis Guide
- SB20-0020 The REXX Handbook -- Ed. Goldberg & Smith (see below)
- | SR23-8926 The NetRexx Language -- M. F. Cowlshaw
- | SG24-2216 Creating Java Applications Using NetRexx -- U. Wahli et al
- SH21-0482 REXX Development System for CICS/ESA and REXX Runtime Facility for CICS/ESA
Guide and Reference
- GG24-1615 Using REXX in Practice: EXEC2 to REXX Conversion Experiences
- SC23-3803 Using REXX to Access OpenEdition MVS Services
- SC23-3501 OS/390 Internet BonusPak II: Web Programming

Books

- The REXX Language -- M. F. Cowlshaw
 - In English: ISBN 0-13-780735-X Prentice-Hall, 1985
 - ISBN 0-13-780651-5 (Second edition), 1990
 - In German: ISBN 3-446-15195-8 Carl Hanser Verlag, 1988
 - ISBN 0-13-780784-8 P-H International, 1988
 - In Japanese: ISBN 4-7649-0136-6 Kindai-kagaku-sha, 1988

Modern Programming Using REXX -- Robert P. O'Hara and David R. Gomberg
ISBN 0-13-597311-2 Prentice-Hall, 1985
ISBN 0-13-579329-5 (Second edition), 1988
(From REXXPress, REXXPress@wcf.com)

REXX In the TSO Environment -- Gabriel F. Gargiulo

ISBN 0-89435-354-3, QED Information Systems Inc.,
Order #CC3543; 320pp, 1990

Revised edition:

ISBN 0-89435-418-3, QED Information Systems Inc.,
471pp, 1993

The REXX Handbook -- Edited by Gabe Goldberg and Phil Smith III
ISBN 0-07-023682-8, 672pp, McGraw Hill, 1991

Practical Usage of REXX -- Anthony S. Rudd
ISBN 0-13-682790-X, Ellis Horwood (Simon & Schuster), 1990

Using ARexx on the Amiga -- Chris Zamara and Nick Sullivan
ISBN 1-55755-114-6, 424pp+diskette, Abacus, 1991

Programming in REXX -- Charles Daney
ISBN 0-07-015305-1, 300pp, McGraw Hill, 1992

The ARexx Cookbook -- Merrill Callaway
ISBN 0-9632773-0-8, 221pp, Whitestone, 1992
(Companion diskette: ISBN 0-9632773-1-6)

Command Language Cookbook -- Hallett German
ISBN 0-442-00801-5, 352pp, Van Nostrand Reinhold, 1992

REXX--Advanced Techniques for Programmers -- Peter C. Kiesel
ISBN 0-07-034600-3, 239pp, McGraw Hill, 1993

REXX Tools and Techniques -- Barry K. Nirmal
ISBN 0-89435-417-5, 264pp, QED, 1993

REXX in der Praxis -- Peter Kees
ISBN 3-486-22666-5, 279pp, Oldenbourg, 1993

VX-Rexx for OS/2 (Programmer's Guide and Reference) 2.0
ISBN 1-55094-074-0 Watcom International Corp., 724pp, 1993

REXX Reference Summary Handbook (OS/2) -- Dick Goran
ISBN 0-9639854-0-X C F S Nevada, Inc, 102pp, 1993.
ISBN 0-9639854-1-8 (second edition), 148pp, 1994.
ISBN 0-9639854-2-6 (third edition, for Warp), 208pp, 1995.
ISBN 0-9639854-3-4 (fourth edition, for Warp 4), 270pp, 1997.

OS/2 2.1 REXX Handbook: Basics, Applications, and Tips -- Hallett German
ISBN 0442-01734-0, 459pp, Van Nostrand Reinhold, 1993

Proceedings of the REXX Symposium for Developers and Users
SLAC Report-422, 247pp, May 18-20, 1993

Mastering OS/2 REXX -- Gabriel F. Gargiulo
ISBN 0-471-51901-4, 417pp, Wiley-QED, 1994

Application Development Using OS/2 REXX -- Anthony S. Rudd
ISBN 0-471-60691-X, 416pp, Wiley-QED, 1994

Writing VX-Rexx Programs -- Ronny Richardson
ISBN 0-07911-911-5, 336pp+CD-ROM, McGraw-Hill, 1994

Teach Yourself REXX in 21 Days -- William F. Schindler & Esther Schindler
ISBN 0-672-30529-1, 527pp, SAMS, 1994

Writing OS/2 REXX Programs -- Ronny Richardson

ISBN 0-07052-372-X, 390pp, McGraw-Hill, 1994

REXX Procedursprak--hur du programmerar din PC med OS/2 -- Bengt Kynning
ISBN 91-44-48541-7, 300pp, Studentlitteratur (Sweden), 1994

The REXX Cookbook -- Merrill Callaway
ISBN 0-9632773-4-0, 319pp, Whitestone, 1995
ISBN 0-9632773-5-9 The REXX files (Companion disk)

Yasashii REXX Nyumon (Introduction to Easy REXX) -- Fumito Yamada
ISBN 4-88648-434-4, Tokyo: Daiwa Art/Di Art, diskette, 1995

ISPF/REXX Development for Experienced Programmers -- Lou Marco
ISBN 1-878956-50-7, 201pp, diskette, CBM Books, Ft. Washington, PA, 1995

REXX ni Yoru OS/2 Nyumon (Introduction to OS/2 via REXX) -- Naohiko Yamashita
ISBN 4-7898-3562-6 Tokyo: CQ Shuppan, 1996

REXX Jiyu Jizai (Handy with REXX) -- Takanori Seki
ISBN 4-7819-0810-1 Tokyo: Science-sha, 1996

Object REXX by Example -- Gwen L. Veneskey et al.
ISBN 0-9652329-0-5, 331pp+disk, Aviar Inc. (+1-412-488-9730), 1996

Practical Usage of MVS REXX -- Anthony S. Rudd
ISBN 3-540-19952-7, 310pp, Springer-Verlag, 1996

Object REXX for OS/2 Warp: REXX Bytes Objects Now -- Trevor Turton et al.
ISBN 0-13-273467-2, 320pp+disk, Prentice-Hall, 1997

Das REXX Lexikon -- Gerd Leibrock
ISBN 3-486-23672-5, 598pp, Oldenbourg Verlag, 1997

The NetREXX Language -- M. F. Cowlshaw
ISBN 0-13-806332-X, 197pp, Prentice-Hall, 1997

Object Oriented Programming with REXX -- Tom Ender
ISBN 0-471-11844-3, 253 pp, Wiley Computer Publishing, diskette, 1997

Object REXX for Windows NT and Windows 95 -- Ueli Wahli et al
ISBN 0-13-858028-6, 490pp+disk, Prentice-Hall, 1997

| Down to Earth REXX -- William F. (Bill) Schindler
| ISBN 0-9677590-0-5, 507pp, Perfect Niche Software, 2000

| Practical Usage of TSO REXX -- Anthony S. Rudd
| ISBN 1-85233-261-1, 324pp, Springer-Verlag, 2000