

## Shell Programming: Hands-On - 3 Days

### Shell Scripting Using Bash and KornShell

*Course 434 Overview*

- You Will Learn How To**
- Write Bash and KornShell scripts for improved productivity
  - Integrate all key language features: arrays, functions, pattern matching, I/O, branches, loops and variables
  - Improve speed by performing multifile handling and string manipulations without external tools
  - Launch and control additional processes
  - Wrap external file and text-handling tools within scripts
  - Customise and extend the user environment login scripts
- Course Benefits** KornShell (**ksh**) and Bash have evolved into full-featured programming languages with efficient built-in modern constructs for superior string handling, decision making, arithmetic and postprocessing. This hands-on course provides the skills you need to write reusable, robust shell scripts to extend the user environment and automate complex administrative tasks.
- Who Should Attend** Administrators, developers and other professionals using shell programming for improved productivity. Knowledge of UNIX or Linux at the level of Course 428, "UNIX Comprehensive Introduction", or Course 143, "Linux Comprehensive Introduction", is assumed.
- Hands-On Training** Throughout this course, you write a series of Bash or KornShell scripts that build in complexity as you master each new construct. Instructor-led exercises include:
- Creating loops and making decisions using **case**, **while** and **if**
  - Performing text-processing tasks using **IFS** and **read**
  - Breaking a large program into functions
  - Handling errors with default values
  - Handling unexpected events with **trap**
  - Manipulating multiple files

# Shell Programming: Hands-On - 3 Days

## Shell Scripting Using Bash and KornShell

*Course 434 Outline*

### Introduction and Overview

- Role of shell scripting
- Benefits of KornShell and Bash vs. other shells
- Differences and similarities between **bash**, **ksh88** and **ksh93**
- Integrating scripts with external tools: **grep**, **sed**, **awk** and others
- Customising the login environment

### Bash and KornShell Scripting Fundamentals

#### Shell script elements

- Commands and comments
- Defining exit values

#### Conditional program execution

- Applying **if** and **case** statements
- Simplifying **if** logic with **elif**

#### Program loops and iteration

- Conditional looping with **while** and **until**
- Listing **for** loops

#### Testing files and directories

- Analysing attributes
- Checking file size and contents

#### Strings and patterns using `[]`

- Comparing strings
- Verifying the existence of a string
- Pattern matching and special characters

#### Debugging

- Redirecting standard error
- **set** commands for debugging

#### Storing and Accessing Data

##### Positional parameters

- Passing and accessing parameters
- Setting and unsetting parameters
- Manipulating parameters as groups

##### Shell variables

- Defining environment and local variables
- Specifying default values and error conditions

#### Arrays

- Creating and indexing arrays
- Processing array contents with special variables

#### Processing Data

##### Manipulating strings

- Extracting substrings

- Determining string length
- Find and replace

#### Mathematics

- Arithmetic **for** and **while** loops
- Writing mathematical expressions: `(( ))`, `$(())` and **let**

#### Modular Programming with Functions

##### Function basics

- Functions vs. scripts
- Parameters and variables

##### Creating a function library

- Finding your library with `PATH`
- `Dot .` and source commands

#### Interacting with the Outside World

##### Manipulating files and redirecting data

- Scripting file and directory management
- Deciphering redirection order
- Unravelling the secrets of **exec**: opening and closing multiple files

##### Interacting with running processes

- Handling errors
- Defining post-termination actions such as notification, cleanup
- Handling and sending signals: **trap** and **kill**

##### Accessing network servers

- Connecting to a network server
- Exchanging data with a network server

#### Creating "Production Quality" Scripts

##### Ensuring environmental control

- Checking and modifying environment variables
- Using **getopts** to process command line options

##### Handling user interactions

- Setting up error processing
- Employing **select** to create a menu interface
- Processing keyboard input