Chapter 1: Introduction

Features and Facilities ... 1
Operating System Structure ... 2
Multi-User Operating Systems ... 3
Handling Programs ... 4
Processes ... 5
Foreground and Background Tasks ... 6
System Start Up ... 7

Chapter 2: Commands and Utilities

Getting Started ... 1
Logging in to a UNIX System ... 1
pwd - print working directory ... 1
Commands and Utilities ... 2
ls - list files ... 2
cat - concatenate ... 3
rm - remove ... 4
head ... 5
tail ... 5
wc - word count ... 5
grep ... 6
mv - move ... 6
Directory Management ... 7
pwd - print working directory ... 7
cd - change directory ... 8
mkdir - make directory ... 8
rmdir - remove directory ... 8
Printing ... 9
lp – line printer ... 9
pr - print ... 9
Network ... 10
who ... 10
talk ... 10
mesg - message ... 11
passwd - password ... 11
Other Useful Commands ... 12
cal - calendar ... 12
man - manual ... 12
set ... 12
Shell Variables ... 13
echo ... 13
Background Processing ... 14
sleep ... 14
pstree - process status, tree display ... 15
Piping Commands ... 16
DOS Commands and UNIX: Equivalence ... 17

Chapter 3: Files and Directories

UNIX filesystem Structure ... 1
File System ... 1
Directories and Files ... 1
Path ... 2
File and Directory Permissions ... 3
Permissions: Viewing ... 4
Permissions: Setting ... 5
Directory Commands ... 6
Changing Directories ... 6
Listing the Contents of a Directory ... 7
Directory Creation ... 7
Directory: Removing ... 8
File Commands ... 9
Viewing the Contents of a File ... 9
cat Command ... 9
more Command ... 9
head and tail Commands ... 10
Files and Directories: Copying ... 11
Files: Moving and Renaming ... 11
Files: Removing ... 12
Redirecting Input and Output ... 13
Redirecting Input ... 13
Redirecting Output ... 14
Redirecting Error ... 15
Pipelines ... 16
grep Utility ... 17
Interaction and Job Control ... 18
Background and Foreground Jobs ... 18
Starting a Job in the Background ... 19
Examining Jobs ... 19
Suspending the Foreground Job ... 19
Placing a Foreground Job into the Background ... 20
Bringing a Background Job to the Foreground ... 20
Starting a Suspended Job ... 20

Chapter 4: UNIX Commands

file Command ... 1
cut Command ... 2
paste Command ... 3
find Command ... 4
grep Command ... 6
sort Command ... 7
cmp Command ... 8
diff Command ... 9
join Command ... 11
pg Command ... 12
pg Sub Commands ... 13

Chapter 5: vi Text Editor

Purpose and Function ... 1
Specifying Terminal Type ... 2
Editing a File ... 3
Getting Out of the Editor ... 3
Moving Around in a File ... 4
Scrolling and Paging ... 4
Searching, Goto, and Previous Context ... 4
Moving Around on the Screen ... 6
Moving within a Line ... 7
Making Changes ... 8
Inserting ... 8
Making Minor Corrections ... 9
Operator Corrections ... 10
Operating on Lines ... 10
Undoing ... 11
Moving, Rearranging and Duplicating Text ... 12
Low Level Character Motions ... 12
High Level Text Objects ... 13
Rearranging and Duplicating Text ... 14
New Files: Writing, Quitting, and Editing ... 16
Escaping to a Shell ... 17
Marking and Returning ... 18
Options, Set, and Editor Startup Files ... 19
Recovery ... 21
Recovering Lost Lines ... 21
Recovering Lost Files ... 21
Character Functions ... 22
Control Characters ... 22
Special Characters ... 24
Digits ... 26
Upper Case Characters ... 27
Lower Case Characters ... 29
Editing: Functional Organization ... 31
Simple Text Editing ... 36
Line-oriented Patterns ... 36

Chapter 6: Execution Environment

Execution Environment: Purpose and Function ... 1
Execution Environment: Creation ... 2
Environment Variables ... 3
Environment and Shell Variables: Setting ... 4
UNIX Shell: Customization ... 5
Shell: Selection ... 5
Default File Access Permissions ... 6
User Login Scripts ... 7
Interactive Use of the Shell ... 14
File Name Completion ... 14
Command Name Aliasing ... 14
Command History Substitution ... 16
ksh ... 16
C Shell ... 17
Command line Editing ... 17

Chapter 7: Shell Programming

Purpose and Function ... 1
Shell Commands ... 1
Shell Variables ... 2
Predefined Shell Variables ... 2
Shell Arguments and Quotes ... 3
Shell Standard Input and Output ... 6
Standard Device Redirection Operators ... 6
Redirecting stdout ... 7
Redirecting stderr ... 7
Pipelines ... 8
Command Substitution ... 9
Shell Positional Parameters ... 9
Predefined Special Shell Variables ... 10
Shell Conditional Tests ... 11
Examples of Shell Scripts ... 12
Batch Processing and UNIX Scheduling Priorities ... 13
UNIX Batch Processing ... 13
UNIX Scheduling Priorities ... 14

Chapter 8: Bourne Shell Programming

Shell Programming: Purpose and Function ... 1
Shell Program ... 1
Shell Programming – Details ... 2
Interpreted versus Compiled/Linked Programs ... 2
Getting Started ... 3
Shell Program: Simple ... 3
Explanation ... 4
Variables ... 5
Predefined Variables ... 6
Parameters - Special Shell Variables ... 8
Nine Parameters ... 9
Shift Command ... 10
$* and $@: Differences ... 10
IO ... 11
Echo and Echo Backslash Options ... 11
STDIN and STDOUT ... 12
if ... elif…, else…fi ... 13
Test Command and Testing ... 15
Expressions ... 17
Case…esac ... 19
Loops and Repeated Action Commands ... 20
while...done ... 20
for…done ... 21
Modifying scanit ... 22
Until…done ... 23
break ... 23
continue ... 25
Redirection ... 26
Functions ... 27
local ... 29
return ... 30
Recursion ... 32

Multi Programming and Background Processing 33
wait Command 33
trap Command 34
trap and wait: Inter-Process Communication 36
Output: Trap and Wait - Inter-Process Communication 39
Debugging 40
Common Mistakes 40
Sample Program 41
Source of scanit 44
Examples 49
Example 1 49
Example 2 50
Example 3 50
Example 4 50
Example 5 51

Chapter 9: Korn Shell Programming

Getting Started 1
Korn Shell Interaction 2
Executing Commands 2
History Stack Operations 3
Shell Commands 4
Conditional Expressions 7
Built-in Commands 9
Job Control 10
Command Substitution 11
File Name Substitution 11
Redirecting Input and Output 12
Aliases 13
Tilde (~) Substitution 13
Environment Variables 14
System Environmental Variables 15
ksh Programming 17
Text Editor: Getting Started 17
Variables 17
Quotes 18
ksh Basics 19
Conditionals 19
Loops 21
ksh and POSIX Utilities 23
Debugging Functions 24
exit versus return 25
Scope for Function Variables 27
ksh built-in Functions 29
read and set 30
The test Function 30
Built-in math 30
Redirection and Pipes 31
Redirection: Extended 31
inline Redirection 32
Pipes 33
Combining Pipes and Redirection 33

Indirect Redirection 34
Programming Constructs and Techniques 35
eval 35
Backticks 35
Text Position and Color 36
Number-based Menus 37
TCP Access 37
Graphics and ksh 38
Programming Guidelines 39
Comments 39
Indent 40
Error Checking 41
Script Development 43
Program: Version 1 43
Program: Version 2 44
Program: Version 3 45
Program: Version 4 47

Chapter 10: sed

Text Editing 1
Line-oriented Patterns 2
Multiple Commands 3
Regular Expression Oriented Patterns 3
Putting sed Programs into Files 4
Inserting Text 5
Replacing the Current Line 6
Aborting Processing 7
Regular Expression Substitution 8

Chapter 11: awk Programming

Purpose and Function 1
Structure of an awk Program 2
Input Lines to awk 2
Command-Line 3
Relational Expressions 4
Simple awk Program 5
Awk Programs and Form Files 6
Simple Pattern Selection 6
Comments in awk Programs 7
Patterns and Procedures 8
Pattern 8
Procedures 9
Simple Pattern 10
Built-in Variables 11
Operators 12
Variables and Array Assignments 13
Escape Sequences 14
User Defined Variables in an awk Program 14
User-Defined Functions 15
Functions and Commands 16

printf Formats 27
Modifying Output 30
The BEGIN and END Statements of an awk Program 33
awk Defined Variables 33