

Chapter 11

Advanced Programming

Overview

- ▣ Shell Arithmetic
- ▣ The `select` Statement
- ▣ Terminal Independence in Scripts
- ▣ The `eval` Command

Lesson: Shell Arithmetic

- ▣ Working with arithmetic
- ▣ Arithmetic Operators
- ▣ Working with Numeric Data

Working with Arithmetic

Shell has built-in rudimentary arithmetic capabilities

- Arithmetic expansion - `$(expression)`
- Expr command

Example:

```
$ count=19
$ x=$((4+count))
$ y=$((expr $count + 8))
$ echo $x $y
23 27
```

Korn shell family can recognize `let` command and arithmetic test `((expression))`

```
$ let "x = 4 + count"
$ if (( x > 3 )) ...
```

Arithmetic Operators

Operator	Operation	Operator	Operation
+	Add	+=	Add assign
-	Subtract	-=	Subtract assign
*	Multiply	*=	Multiply assign
/	Divide	/=	Divide assign
%	Modulo	()	Group

```
$ b=5
$ echo $(( b / 2 ))
2
$ echo $((var=(b+2)*3))
21
$ echo $var
21
```

Working with Numeric Data

bc	Desktop calculator
eval	Evaluate command
awk	UNIX command/program language
perl	UNIX command/program language
<code>ls -l file cut</code>	Pipelines producing numbers
<code>\$(wc -l < file)</code>	Command substitution producing numbers
<code>\${#string}</code>	Length of string variable contents
<code>\$\$</code>	Current shell Process ID (PID)
<code>\$PPID</code>	Integer number of parent process
<code>\$RANDOM</code>	Random integer
<code>\$SECONDS</code>	Elapsed seconds

Lesson: The select Statement

Syntax

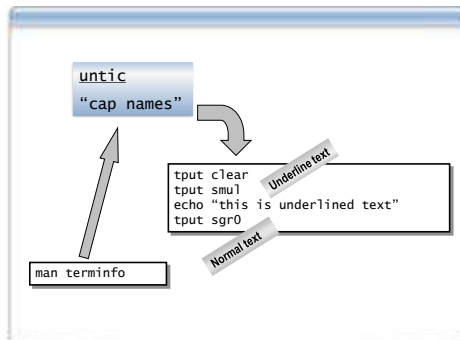
```
PS3="prompt string"
select var in argument_list
do
  commands
done
```



Example

```
PS3="Command?"
select ans in ls pwd date quit
do
  if [ "quit" = "$ans" ] ; then
    break
  else
    $ans
  fi
done
```

Lesson: tput – change terminal characteristics



Lesson: The eval Command

Syntax:

```
eval [argument ...]
```


- Construct command by concatenating arguments

Helps build commands on the fly

Example:


```
$ set one two three four
$ echo $#
4
$ echo '$' $#
$4
$ eval lastarg='$' $#
$ echo $lastarg
four
```

Review Exercises



■ Complete the exercises from the Learning Guide

Topics for Review



- 1 Read the review topics
- 2 Think about what you learned in this Session in the context of your own work environment
- 3 Discuss your answers as a class
