CEGEP VANIER COLLEGE
CENTRE FOR CONTINUING EDUCATION
Introduction to Linux
420-995-VA

Teacher: S.Chebbine **Lab Review 6** **Mar 11, 2015**

Lab Review 6: Introduction to Shell Programming

1. Create and Submit a Word file ***Lab6LinuxYourName.doc*** which contains a good sample of output screenshots for every Shell Program and your Linux files. For this purpose, students should capture the screen display and use Paint to cut/past and submit the appropriate windows (and not the entire screen display) displaying the output for each command.

2. Components of Shell Programming:
   a) Shell variables
   b) Shell script operators
   c) Logical or control structures

The use of comments

Use comments with a pound (#) symbol, so that later it is easier to remember how the Shell statements were programmed, providing therefore a sort of documentation.

```
#=============================================
#                  This is a Shell Comment
#=============================================
```

a) Shell variables

x=5 not x = 5

b) Shell script operators

- Assigning a value to variable like NAME=Amanda or NAME="Amanda Zubrow"
- Use ($) in front of the variable along with *echo* command to view the contents Echo $NAME, reading a value from keybord using *read*.
- Arithmetic operators: (+) (-) (*) (/) relational operator (>) (<) (=) (!=)

Using vi, create the following Shell program to be named *GenralP1*

```
NAME=Vanier
echo  $NAME
echo  'College is called '$NAME

NAME=Makivik
echo  'Company is called '$NAME

x=10
echo $x

let y=20
echo $y

z=10+20
echo $z

let z=10+20
echo $z
```

GenralP1

```
samir@linux-ces1:~/Review/Review6> sh GeneralP1
Vanier
College is called Vanier
Company is called Makivik
10
20
10+20
30
```

- Notice the use of the expression ***let***, which stores the result in a shell variable.

```
samir@linux-ces1:~/Review/Review6> sh Sum1
Enter your First Number 12
Enter your Second Number 8
The result of Adding 12 and 8 is 20
```

Figure A

```
GeneralP1: line 14: let: +: syntax error: operand expected (error token is "+")
```

***Error to avoid when using* (+)**

1. **Create a Shell program *Sum1* that calculates the sum of two numbers and display the result as shown in Figure A.**

3. Shell Programming and the use of awk for formatting report.

Mastering Awk Program: Manipulate data files (fields and records) very efficiently, **use variables, use arithmetic/logical operators, loops, and output data into a given format.**

a) Create the following *Employee* file. Using *vi*, write an **awk** program (*EmployeeSumReport*) to display *all employees and the sum of their salaries* as shown in Figure B.

E_ID	E_Last	E_First	E_Salary
1	Blake	James	150000
2	Lee	Huing	70000
3	Brendon	Jessica	90000
4	Tremblay	Suzan	45000

Employee File

```
awk 'BEGIN {
       {print "\t\t List of All Employees\n"}
       {"date" | getline d}
       {printf "\t %s\n", d}
       {print "EmployeeID\tEmployee LName\t\t Employee FName\t Salary\n"}
       {print "================================================================="}
      }
      { s+=$4 }
      { printf " %-2s\t\t%-8s\t\t %s\t\t %d\n", $1, $2, $3, $4}
      END { print"\t\t\tSum of Salaries: ",s}' Employee
```

Shell Program

```
samir@linux-ces1:~/Review/Review6> sh EmployeeSumReport
                  List of All Employees

          Wed Nov  9 03:40:33 EST 2011
EmployeeID      Employee LName          Employee FName  Salary

=================================================================
 1              Blake                   James           150000
 2              Lee                     Huing           70000
 3              Brendon                 Jessica         90000
 4              Tremblay                Suzan           45000
                        Sum of Salaries:  355000 $
```

Figure B

b) Create the following *Product* file. Using *vi*, write an **awk** program (*ProductSumReport*) to display *all product and the sum of their prices*.

P_ID	P_Name	P_Price
1	Muffler	450
2	Shocks	50.45
3	Alternator	79.99
4	Battery	29.99
5	Radiator	128.32
6	Coil	45.99
7	Spark-plugs	39.50

Product File

4. Create a Shell program Program1 that uses decision logic *if ….else* as in Figure 1.

```
samir@linux-ces1:~/Review/Review7> cat Program1

echo  -n " Enter the name "
read  NAME

if [ "$NAME" = "VANIER" ]
then
echo  "It is about College Vanier"
else
echo  "It is about Company Makivik"
fi


samir@linux-ces1:~/Review/Review7> sh Program1
 Enter the name VANIER
It is about College Vanier
```

Figure 1

5. Create a Shell program Program2 that uses nested decision logic *if ….else* as in Figure 2.

```
samir@linux-ces1:~/Review/Review7> cat Program2

echo  -n " Enter the name "
read  NAME

if [ "$NAME" = "VANIER" ]
then
   echo  "It is about College Vanier"
else
   if [ "$NAME" = "MAKIVIK" ]
   then
      echo  "It is about Company Makivik"
   else
      echo  "It is about Something else"
   fi
fi
samir@linux-ces1:~/Review/Review7> sh Program2
 Enter the name MAKIVIK
It is about Company Makivik
```

Figure 2

6. Mathematical operations in Shell:

   a) Create an interactive Shell Program that that calculates the subtraction between the above numbers as shown in Figure 3.

```
samir@linux-ces1:~/Review/Review7> sh Substract1
Enter your First Number 26
Enter your Second Number 8
The result of Substraction of 26 and 8 is 18
```

Figure 3

b) Create an interactive Shell Program that that calculates the product between the above numbers as shown in Figure 4.

```
samir@linux-ces1:~/Review/Review7> sh Product1
Enter your First Number 6
Enter your Second Number 12
The result of Multiplying 6 and 12 is 72
```

Figure 4

c) Add up all your previous programs into one final Shell program as shown in Figure 5.

```
samir@linux-ces1:~/Review/Review7> sh MathOperation
Enter your First Number 15
Enter your Second Number 6
The result of Adding 15 and 6 is 21
The result of Substraction of 15 and 6 is 9
The result of Multiplying 15 and 6 is 90
```

Figure 5

Objectives
• Advanced Linux Commands, awk Program

1. Review Question (2 marks)
    - Complete review question 9, 10, 11, 16 page 310-311

2. (3 marks) Complete the exercises of:
    - Hands-On Projects 6-2 page 313.
    - Hands-On Projects 6-3 page 315.
    - Hands-On Projects 6-7 page 319.

What to hand in

Create and Submit the Word file LinuxCh5-6YourName.doc for storing the following :

1. A good sample of output screenshots. For this purpose, students should capture the screen display and use Paint to cut/past and submit the appropriate windows (and not the entire screen display) displaying the output for each question, if any. You have to paste the Script shell commands used for this purpose, if any.