CSC3320 System Level Programming Rafid Shaon

Lab Assignment 6 - Part 2 - Post Lab

Due at 11:59 pm on Friday, Feb 26, 2021

Purpose: Learn the differences between writing a Bourne shell script and Java program. Learn how to use command argument in a Bourne Shell script. Learn how to compile and run Java and C programs in Unix terminal.

Part A:

```
#!/bin/bash
#
#foo.sh in Part A of Lab 6 - Part 1
#

x=0 # initialization x = 0
i=1
while [ $i -le 3 ]  # while(i<=3)
do
s=`expr $i \* $i`  # s=i*i
x=`expr $s + $x`
i=`expr $i + 1`  # i=i+1
done

echo x=$x
```

Please complete the tasks in the following table step by step and finish the questions below the table.

Step 1: Go to your home directory (cd ~) and create a new file named as **foo.sh (vi foo.sh or nano foo.sh),** then include the following lines in your **foo.sh.**

Step 2: Save your file and exit editor.

Step 3: Try following command to make foo.sh executable.
$chmod a+x foo.sh
Step 4: Execute this file by invoking its name.

$./foo.sh

*Note: when typing the shell script in your terminal, please be very careful of the **spaces**.*

Questions:

1) Attach a screenshot of the output in step 4.

```
[[rshaon1@gsuad.gsu.edu@snowball ~]$ chmod a+x foo.sh                    ]
[[rshaon1@gsuad.gsu.edu@snowball ~]$ ./foo.sh                            ]
x=14
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

2) Describe what does the shell script **foo.*sh*** do?

#!/bin/bash

#

#foo.sh in Part A of Lab 6 - Part 1

#

x=0 #initialization x = 0

i=1 #initialize i=1 to use it as counter for loop

while [$i -le 3] # while(i<=3) run the loop till i<=3 that means loop will run 3 times

do

s=`expr $i \* $i` #s=i*i s = 1 in first iteration, s = 4 in second iteration, s = 9 in third iteration

x=`expr $s + $x`#x=s+x, x = 1 in first iteration, x=5 in second iteration, x = 14 in third iteration

i=`expr $i + 1` #i=i+1 #increment i by 1

done

echo x=$x #print x whose value is 14

Part B:

Step 1: Edit your ***foo.sh*** and change **" -le 3** " to " **-le $1** " .

Step 2: When finished, save the ***foo.sh*** and exit editor. Then try executing it again by typing the following command.
$./foo.sh 5

Question:
Attach a screenshot of the output.

```
[rshaon1@gsuad.gsu.edu@snowball ~]$ ./foo.sh 5
x=55
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

Part C:

Step 1: Edit your ***foo.sh*** in part B by making following modifications:

• Add two new lines below between line "**i=1"** and line "**while [$i -le $1]"**

```
echo please input a number
read num
```

• Change **" -le $1** " to " **-le $num** " .

Step 2: When finished, save the ***foo.sh*** and exit editor. Then try executing it again by typing following command and **type 5** as the input of the number.
$./foo.sh

Question:
Attach a screenshot of the output.

```
[rshaon1@gsuad.gsu.edu@snowball ~]$ ./foo.sh
please input a number
5
x=55
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

Part D:

Write a Java program named **foo.java** to accomplish the same task as that in foo.sh of Part A.

Note: If you want to run your Java program in terminal,

- to compile foo.java, please try
  $javac foo.java
- To execute it, please try
  $java foo

Question:

Then put the source code of **foo.java** in your answer sheet.

```
[[rshaon1@gsuad.gsu.edu@snowball ~]$ cat foo.java                    ]
public class foo {
public static void main(String args[]) {
int x = 0, i = 1, s;
while (i <= 3) {
s = i * i;
x = s + x;
i++;
}
System.out.println("x=" + x);
}
}
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

```
[[rshaon1@gsuad.gsu.edu@snowball ~]$ javac foo.java                  ]
[[rshaon1@gsuad.gsu.edu@snowball ~]$ java foo                        ]
x=14
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

Part E:

Create and run Kernighan and Ritchie's famous "hello,world" program. Step 1: Go to your home directory (cd ~) and create a new file named as **hello.c (vi hello.c**

or nano hello.c), then include the following lines in your **hello.c .**

```
#include <stdio.h>

int main(void)
{
  printf("Hello,world\n");
  return 0;
}
```

Step 2: Save your file and exit editor.

Step 3: Compile and link the hello.c program by following command.
$cc hello.c

Note*: after this command, a default executable program named as "****a.out****" will be generated in the current directory if there are no errors with your C program. You can use* ***ls*** *to check the existence of a.out .*
Step 4: Run the executable program ***a.out***

$./a.out

Questions:

1) Attach a screenshot of the output in step 4.

```
[}[rshaon1@gsuad.gsu.edu@snowball ~]$ vi hello.c
[[rshaon1@gsuad.gsu.edu@snowball ~]$ cc hello.c
[[rshaon1@gsuad.gsu.edu@snowball ~]$ ls
=              csc3320    foo.java  h2.awk    homeworks  public     test.txt
a.out          float      foo.sh    hello.c   Lab3       Result
checkError.sh  foo.class  h1.awk    hello.sh  Lab4       simple.sh
[[rshaon1@gsuad.gsu.edu@snowball ~]$ ./a.out
Hello,world
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

2) Try following command to compile and link **hello.c** again. And tell what new file is generated after this command?

$cc -o hello hello.c

hello is the new file after using this command.

```
[[rshaon1@gsuad.gsu.edu@snowball ~]$ cc -o hello hello.c
[[rshaon1@gsuad.gsu.edu@snowball ~]$ ls
=              csc3320    foo.java  h2.awk    hello.sh   Lab4     simple.sh
a.out          float      foo.sh    hello     homeworks  public   test.txt
checkError.sh  foo.class  h1.awk    hello.c   Lab3       Result
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

3) Try the command below and attach a screenshot of the output.

$./hello

```
[[rshaon1@gsuad.gsu.edu@snowball ~]$ ./hello
Hello,world
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

4) Now write a new C program named as **myName.c** based on **hello.c**. In this program, print out your first name and last name instead of "Hello,world". For example, the output could be "My name is Yuan Long".

Execute your **myName.c** and attach a screenshot of the output. Then write the source

code of **myName.*c*** in your answer sheet and upload your file **myName.*c*** to the classroom.

```
[rshaon1@gsuad.gsu.edu@snowball ~]$ cat myName.c
#include <stdio.h>

int main(void)
 {
   printf("My name is Rafid Shaon\n");
   return 0;
 }
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

```
[rshaon1@gsuad.gsu.edu@snowball ~]$ vi myName.c
[rshaon1@gsuad.gsu.edu@snowball ~]$ cc myName.c
[rshaon1@gsuad.gsu.edu@snowball ~]$ ls
=              csc3320    foo.java  h2.awk   hello.sh   Lab4       Result
a.out          float      foo.sh    hello    homeworks  myName.c   simple.sh
checkError.sh  foo.class  h1.awk    hello.c  Lab3       public     test.txt
[rshaon1@gsuad.gsu.edu@snowball ~]$ ./a.out
My name is Rafid Shaon
[rshaon1@gsuad.gsu.edu@snowball ~]$
```

Submission:

Note: Please follow the instructions below step by step, and then write a report by answering the questions and upload the report (named as Lab6_FirstNameLastName.pdf or Lab6_FirstNameLastName.doc) to Google Classroom, under the rubric Lab 6 Out-of-lab Assignment.

Please add the lab assignment NUMBER and your NAME at the top of your file sheet.