Birla Institute of Technology & Science, Pilani, K. K. BIRLA Goa Campus
Computer Programming (CS F111)
Second Semester 2013-2014
Lab-4 (Shell - Scripting)

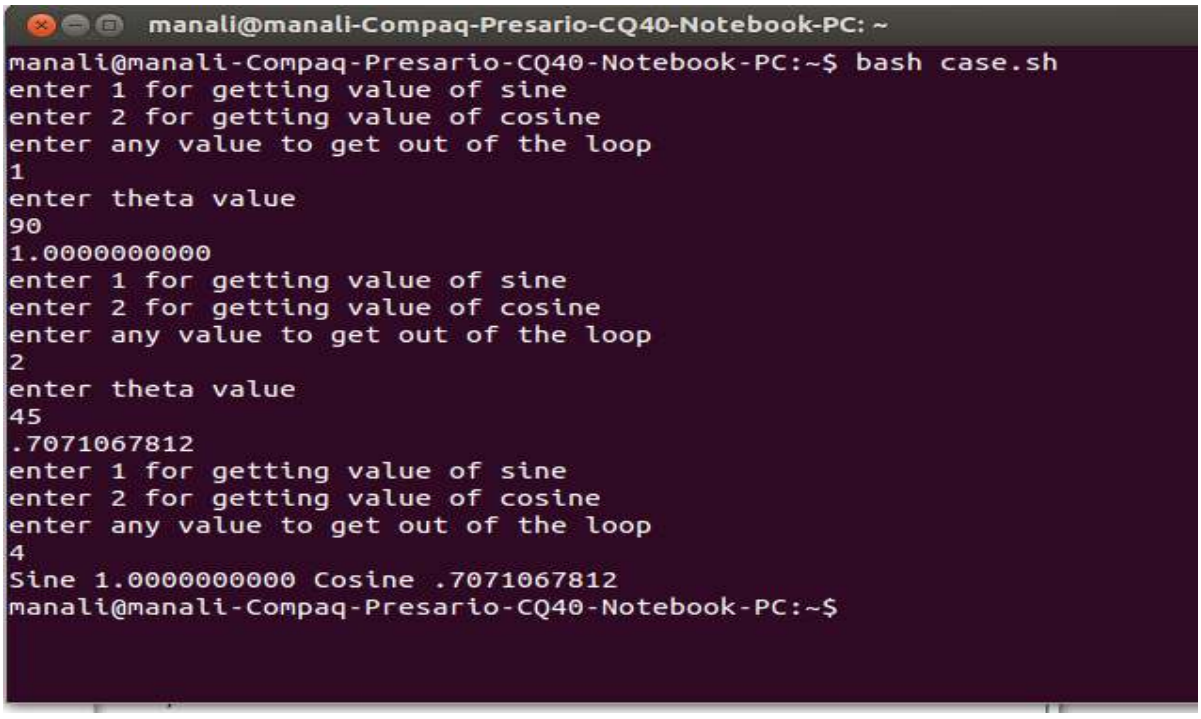
Question #1

Write an interactive **trigonometry calculator** which calculates sine and cosine values with 10 digit precision using a shell programming. The program takes the choice (sine or cosine) and theta value (in degrees) from user and stores the result in an array named **Theta[].** The program keeps on taking input until user decides to quit. Once user decides to quit, the program will display **Theta[]** (Each element of an array will contain sine/cosine as a string according to the choice and the value of sine theta / cosine theta accordingly).

(Example value of an element in Theta[] when input is sine 90 sine 1.0000000000)

(Hint: use degree to radian conversion (theta in degree = (theta in radian * pi)/180)

(**Hint: You can use math library functions to calculate value of cosine and sine)**



Question #2

Write a shell script program to read a number N from the user [the program should make sure that the number is in between 1 and 1000] and find all the EVIL numbers between 1 and N.

Definition of EVIL Number:
The Number is an evil number if it has even number of 1's in its binary expansion.

Examples:
Example 1: 40
Binary expansion=101000
Number of 1's=2
40 is an Evil Number
Example 2: 666
Binary expansion=1010011010
Number of 1's= 5
666 is not an Evil Number
Expected Output: 3 is an Evil Number
5 is an Evil Number
6 is an Evil Number
9 is an Evil Number
…..

Steps to solve the problem

Step 1: Read input N from user
Step 2: If N is greater than 0 AND N is less than 1000 then proceed to Step 3. Otherwise print "Wrong Input" and go to Step 7
Step 3: Initialize i to 1
Step 4: If i is less than or equal to N then proceed to Step 5; otherwise go to Step7
Step 5: Check whether n is an Evil number
Step 6: i = i + 1. Go to Step 4
Step 7: Finish the program

Steps to find whether the number is an Evil number

Step 5.1: Initialize count to 0; n to i;
Step 5.2: If n is greater than 0 then proceed to Step 5.3; otherwise go to Step 5.6
Step 5.3: If n % 2 is 1 then count = count + 1
Step 5.4: n = n / 2
Step 5.5: Go to Step 5.2
Step 5.6: If count % 2 is 0 then Print i is an Evil Number.