Digital Design Verification

Assignment # 02

LOOPS

Release: 1.0

Date: 23-April-2024

NUST Chip Design Centre (NCDC), Islamabad, Pakistan

Revision History

Revision Number	Revision Date	Nature of Revision	Approved By
1.0	2/05/2024	Complete manual	Dr. Abid
1.1	30/07/2024	Revision in manual	Hira Sohail

[Azad's Law: The one facilitating cheating will be punished with 0 marks]

The objective of this lab is to enable students to answer the following questions:

- How to use flow charts to devise algorithms for solving problems?
- What sort of problems require decision making?
- How does C/C++ support decision making?
- How to use loops in solving real world problems?

TASK # 01:

Take the positive integer N from the user and print the following series:

a. 0,1,1,2,3,5,8,13,…….

b. Print the numbers from 0 to N with an increment. This increment will be taken as input from the user and it will be less than 1 *e.g.* 0.5. If the user enters increment greater than 1, the program should print error and exit, otherwise it should print numbers from 0 to N with the increment specified by the user.

Flow Chart : 15 minute **Coding :** 15 minute

TASK # 02:

Uniform Probability

Consider a program which figures out the probability of head (1) and tail (0) by tossing a coin. Simulate the tossing of coin by using the following code snippet. Enter the number of trials N from the user for how many times one would toss the coin. Find out the probability of head and tail by figuring out the frequency divided by the number of trials N.

```
#include <cstdlib>

#include <iostream>

using namespace std;

int main()

{

   int Limit = 2;

   int N = rand() % Limit;   // Will generate a number between 0 and Limit

   return 0;

   }
```

Flow Chart: **1**5 Minutes **Code:** 15 Minutes

TASK # 03:

Possible Combinations

Imagine Elements Learning is a startup focused on selling educational toys. Elements Learning want to give discount on pair of toys. Write a program which takes N as types of toys being produced by Elements Learning. Your program should return the number of distinct pairs on which discount can be given?

Example: 5 Types of Toys, the number of distinct toy pairs will be 10.

Submission:

Please submit .c files of all the tasks along with the screenshots of outputs on LMS in a proper report. Include snaps of flow charts in your report.