National University of Computer and Emerging Sciences

Lahore Campus

Software Testing (CS4036)

Sessional-I Exam

Date: Feb 25th 2025

Course Instructor(s)

Ms. Lehmia Kiran

Total Time (Hrs): 1

Total Marks: 25

Total Questions: 1

22L-6790 Roll No

6A Section

Student Signature

Do not write below this line

Attempt all the questions.

CLO #: 2,3

Q1: [15+6+4=25marks]

Following are the requirements and code:

You often need to convert Rupees into coins of 5, 2, and 1. Your task is to develop a C++ program to compute a mix of coins of 5, 2 and 1 against the given amount of money. Remember that you may not always have enough coins. So the program should be able to covert the money into the coins available. For example, if you don't have the coins of 5-rupees, then for 7 rupees the program should compute a mix of 2-rupees and 1-rupee coins. The program should also take as input the number of 5-rupees, 2-rupees and 1-rupee coins available. The program should display the amount of money in terms of numbers of 5-rupees coins, 2-rupees coins and 1-rupee coins if possible with the available set of coins. Otherwise print the message "Sorry!! No such combination exists.

Code

```
#include <iostream>
using namespace std;
int main() {
  int fiveCoins = 0, twoCoins = 0, oneCoins = 0;
  int money;
  int availableFive = 0, availableTwo = 0, availableOne = 0;
  int reqFive = 0, reqTwo = 0, reqOne = 0;
  cout << "\nPlease enter 5-rupees coins: ";
  cin >> availableFive;
  cout << "\nPlease enter 2-rupees coins: ";
  cin >> availableTwo;
  cout << "\nPlease enter 1-rupee coins: ";
  cin >> availableOne;
  cout << "\n=====================================\n";
  cout << "\n=====================================\n";
```


Anomaly 1- Defined but redefine
2- Defined but not referenced
3- referenced but not defined

```
cout << "\nNow please enter the money you have: ";
cin >> money;
if (availableFive == 0 && availableTwo == 0 && availableOne == 0)
  cout << "\nSorry, can't provide you change. No coins available\n";
else {
  if (money > 0) {
    reqFive = money / 5;
    if (reqFive > availableFive) {
      fiveCoins = availableFive;
      money -= fiveCoins * 5;
      availableFive -= fiveCoins;
    } else if (reqFive <= availableFive && reqFive > 0) {
      fiveCoins = reqFive;
      money -= fiveCoins * 5;
      availableFive -= fiveCoins;
    }
  }
  if (money > 0) {
    reqTwo = money / 2;
    if (reqTwo > availableTwo) {
      twoCoins = availableTwo;
      money -= twoCoins * 2;
      availableTwo -= twoCoins;
    } else if (reqTwo <= availableTwo && reqTwo > 0) {
      twoCoins = reqTwo;
      money -= twoCoins * 2;
      availableTwo -= twoCoins;
    }
  }
  if (money > 0) {
    reqOne = money / 1;
    if (reqOne > availableOne && money > 0) {
      oneCoins = availableOne;
      money -= oneCoins * 1;
      availableOne -= oneCoins;
    } else if (reqOne <= availableOne && reqOne > 0) {
      oneCoins = reqOne;
      money -= oneCoins * 1;
      availableOne -= oneCoins;
    }
  }
  if (money == 0) {
    cout << "\nHere's your change...\n";
    cout << "\tFive Coins\tTwo Coins\tOne Coins\n";
    cout <<
"\n=============================================================\n";
    cout << "\t\t" << fiveCoins << "\t\t" << twoCoins << "\t\t" << oneCoins << endl;
  } else {
    cout << "\n Sorry !! No such combination exists\n";
```

```
    }
  }
  return 0;
}
```

For above requirements and the code, answer the following questions:

Part (a):

How many paths are required to achieve 100% statement coverage, are the paths for 100% statement coverage and 100 % branch coverage the same? [10+5]

Part (b): [6]

Is there any data flow anomaly for variable "**money**" in the code? If yes then which type of anamoly is this?

Part (C): [4]

Are all definitions of variable "**availableFive**" the global definition ?