National University of Computer and Emerging Sciences



Lab Manual 06

Programming Fundamentals

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| Section | F |
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## Objectives

After performing this lab, students shall be able to:

* Have an improved problem-solving ability
* Understand Nested Loops
* Implement functions

Note: For each of these questions, write the C++ program.

**TASK 1:**

Using while loop, write a C++ program to print the given star pattern. User will enter the height.

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**TASK 2:**

Write a C++ program to print the pattern, User will enter the height.

1 2 3 4 5

2 3 4 5 1

3 4 5 2 1

4 5 3 2 1

5 4 3 2 1

**TASK 3:**

Write a program to list down all the prime factors of a number

**Sample Input:**

**Enter Number: 36**

**Sample Output**

**Prime Factors: 2,2,3,3**

**TASK 4:**

The cost to become a member of a fitness center is as follows:

1. The senior citizens (age>50years) discount is 20%.
2. If the membership is bought and paid for 12 or more months, the discount is 10
3. If more than five personal training sessions are bought and paid for, the discount on each session is 15%.

Write a menu-driven program that determines the cost of a new membership. Your program must contain

* 1. a **function** that displays the program and discounts available
  2. a **function** to get all of the necessary information to determine the membership cost, and
  3. a **function** to determine the membership cost.

Use appropriate parameters to pass information in and out of a function. (Do not use any global variables.)

**TASK 5:**

Write a program which will print prime numbers up to a give value. You need to write a function which will tell that a particular number is prime number or not.

**Sample Input:**

**Enter Limit: 40**

**Sample Output**

**Prime Numbers: 2,3,5,7,11,13,17,19,23,29,31,37**

**TASK 6:**

You often need to convert Rupees into coins of 5, 2, and 1. You 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.

You should get the number of coins by using functions

For example:

getCoinsOf5 (….) // for getting coins of 5

getCoinsOf2 (….) /// for getting coins of 2

or you can make just one function getCoins(…) for getting coins however this function will run only 1 time for one type of coin. For example, you will the tell function that for which coin number (5,2 or 1) it needs to be executed and then you can get result for that particular coin number.

**Sample Input:**

**Enter Limit: 48**

**Enter Coins of 5 available: 7**

**Enter Coins of 5 available: 8**

**Enter Coins of 5 available: 5**

**Sample Output:**

**Coin(s) of 5 needed: 7**

**Coin(s) of 2 needed: 6**

**Coin(s) of 1 needed: 1**