



UNIVERSITY OF THE PUNJAB
Faculty of Computing and Information Technology (FCIT)
Department of IT (DIT)
Programming Fundamentals- ASSIGNMENT#01
BS(IT) - Fall 2024 (Semester Spring 2024)

Course Code: CC-112

Instructor Name: Hafiz Anzar Ahmad



Welcome ITF24! This *Assignment* is designed for the better understanding of the concepts covered so far.

Deadline: Sunday (11:59 pm)

Instructions:

- Solve each problem by writing a clear and step-by-step explanation.
- Wherever needed, provide multiple approaches to solving the problem.
- Absolutely no collaboration is allowed.
- Any case of cheating or plagiarism will result in a **zero** for this assignment.
- This is a handwritten assignment. You must take pictures and upload them as a PDF on Google Classroom before the deadline..
- You also need to submit the physical copy to your respective CR this Monday.
- Late submissions will not be accepted.
- Name of your file should be YourRollNumber_ A01 e.g. **BITF24X0XX_ A-01.**

SECTION-1

Question 1:

You need to store the following information in a computer:

A student's roll number (e.g., 1234)

A student's name (e.g., "Ali Ahmed")

A student's CGPA (e.g., 3.75)

A student's attendance percentage (e.g., 89.5%)

Question 2:

Find the missing numbers in the following sequences:

2, 6, 12, 20, ?, 42

3, 8, 15, 24, ?, 48

5, 11, 19, 29, ?, 53

2, 5, 10, 17, ?, 37

1, 3, 7, 13, ?, 31

For each sequence, identify the pattern, explain the steps, and provide the missing number.

Question 3:

A company needs a system to calculate employees' salaries based on hours worked and hourly wages. What inputs, processes, and outputs would you identify before coding?

Question 4:

Coding-Decoding

- a) If VGMACQ is coded as WHNCDR, then what will be the code for MOTHER ?
- b) If A=1 and BAD is written as 214 , then what will be the code for ACE ?

Question 5:

Logical Games

- a) If Sarah has a red pen, a blue pen, and a green pen, how many different ways can she arrange them in a row on her desk?
- b) If you have a pizza divided into 8 equal slices, and you eat 3 slices, how many slices are left for me?

Question 6:

Imagine you are at a traffic signal. The light can be Red, Yellow, or Green.



Red: Stop

Yellow: Slow Down

Green: Go

How would you design a flowchart or step-by-step logic for a program that takes the light color as input and outputs the correct action?

Question 7:

A prime number is a number greater than 1 that has only two factors: 1 and itself. Your task is to determine whether a given number N is prime or not.

Input:

A single integer N (where $N \geq 1$).

Output:

Print "Prime" if N is a prime number.

Print "Not Prime" otherwise.

Additionally, you must:

Draw a flowchart to represent the logic of your solution.

Write a C program to implement the solution.

SECTION-2

These problems must be solved using at least two different approaches. This will help you understand that there is no single way to solve a problem, and different approaches can lead to the same result.

Question 8:

Find the sum of the first N natural numbers using two different methods.

You need to find the sum of the first N natural numbers (1, 2, 3, ..., N).

For example:

If $N = 5 \rightarrow 1 + 2 + 3 + 4 + 5 = 15$

If $N = 10 \rightarrow 1 + 2 + \dots + 10 = 55$

Question 9:

You are given an integer N. Your task is to determine whether N is an even number or an odd number.

However, you must solve this problem using two different approaches.

Example Inputs & Outputs:

Example 1:

Input: N = 8

Output: Even

Example 2:

Input: N = 13

Output: Odd

BEST OF LUCK! ☺

while (not_succeed)

{ try again! :) }