National University of Computer and Emerging Sciences



# Assignment # 01

For

# Programming Fundamentals Lab

| Lab Instructor(s) | Mr. Mughees Ismail |
|---|---|
| Semester | Fall 2022 |

**FAST School of Computing**

## Instructions:

1. Make a word document with the convention "SECTION_ Assignment#_ROLLNO" and put all your source code and snapshots of its output in it.
2. Plagiarism is strictly prohibited, if you take a code snippet off the internet, mention its reference.
3. Do not discuss solutions with one another.
4. You are not allowed to take help from the internet for logics.

## Task 01:

Write a pseudo code that reads two numbers from user and prints their sum.

## Task 02:

Write a pseudo code that reads a number from user and prints it's square.

Dry run your pseudo code on following inputs:
- 2
- 10
- 50

## Task 03:

Write pseudo code that takes modulus of two numbers and prints it.

## Task 04:

Draw a flowchart that reads a number and prints whether it's even or odd.

Dry run your pseudo code on following inputs:
- 2
- 47
- 100

## Task 05:
Draw a flowchart for ATM machine of HBL.
ATM machine should take a credit/ debit card and check if it's valid. Then it should take pin from user and check the pin. If pin is right, it should display a main menu to user containing two options:
1. Withdraw money
2. Check Balance

If user selects to withdraw money it should take the amount that user wants to withdraw and withdraws the amount, or if user selects to check balance it should print the current balance of user. The machine will return card to user after completing the process.

## Task 06:
Draw a flowchart of a calculator, takes two numbers and the operator (+, -, /, *) and prints the result of that operation.

Dry run your flowchart on following inputs:
- 2 and 7 with operator "+"
- 100 and 10000 with operator "*"
- 1 and 0 with operator "/"

## Task 07:
Write pseudo code that tells a user that the number they entered is not a 2 or a 4.

## Task 08:
Write pseudo code that performs the following: Ask a user to enter a number. If the number is between 0 and 10, write the word blue. If the number is between 10 and 20, write the word red. if the number is between 20 and 30, write the word green. If it is any other number, write that it is not a correct color option.

Dry run your pseudo code and check what it prints if we give following numbers:
- 25
- 70
- 4

## Task 09:
Write a flowchart that finds the largest among three different numbers entered by the user.

Dry run your flow chart with any three numbers of your choice.

## Task 10:
Draw flowchart that will perform the following:
1. Read in 5 separate numbers.
2. Calculate the average of the five numbers and print it.
3. Find the smallest (minimum) and largest (maximum) of the five entered numbers and print them.

## Task 11:
Draw a flowchart that will perform the following:
1. Reads marks from the user.
2. Prints "A+" if marks are greater than 90.
3. Prints "A" if marks are greater than 80 and less than 90.
4. Prints "B+" if marks are greater than 70 and less than 80.
5. Prints "B" if marks are greater than 60 and less than 70.
6. Prints "C" if marks are greater than 55 and less than 60.
7. Prints "D" if marks are greater than 50 and less than 55.
8. Prints "F" if marks are less than 50.

## Task 12:
Metro Pakistan has launched a promotion for its credit card customers. According to the promotion, the customers will receive a gift voucher worth 3000 PKR, if their shopping bill is more than 15,000 PKR, but if their shopping bill is more than 30,000 PKR, the customers will receive the gift voucher worth 6000 PKR. Draw a flowchart which:
1. Takes user's credit card and checks the validity of card.
2. Reads the amount of shopping bill and prints out the amount of gift voucher.
3. Asks user to withdraw the gift voucher amount or use it now to pay the shopping bill.
4. If user selects to use the voucher now, it must print the new amount of shopping bill (new shopping bill = old bill – voucher amount) or if user selects to withdraw gift voucher amount, it must print the amount of gift voucher user got.

## Task 13:
Write a pseudo code that reads 3 numbers and apply the formula $((x + y) / z)$ and prints the result.

## Task 14:
Write a pseudo code that prints the area of square.

## Task 15:
Write a pseudo code that prints the area of triangle.

## Task 16:

Draw a flowchart that:
1. Stores a random first name as a variable.
2. Asks the user to input their first name.
3. If it is the same as the stored name, outputs 'You're cool.'
4. Otherwise, outputs 'Nice to meet you.'

## Task 17:

Draw a flowchart for a receptionist at PTCL. The receptionist will route the incoming phone calls to correct department.

- If the customer wants to file complaint, then take the name, billing id and address from the customer and print the unique complaint number.
- If the customer wants to have issue with billing, the receptionist will route the phone call to the billing department.
- If the customer wants to talk to manager, the receptionist will route the phone call to manager office.
- If the user wants to talk to sales, take the name and order placing address from user and route the phone call to sales department.

## Task 18:

It's very tiring to get up early in morning and get ready for university, everyone got a different routine. Draw a flowchart of your everyday routine of getting ready for university.

## Task 19:

It's weekend and you must get yourself some snacks so that you can watch your favorite movie in peace, you've 500 PKR in your pocket, the store near you is 5 km away from your home sweet home. You can get there on bus using 50 PKR, or on your feet with no money used as you wish. There you can get snacks of any kind in 100 PKR, cold drink of any kind in 100 PKR, biscuits of any kind in 50 PKR, ice cream of any kind in 100 PKR.
Note: you must save 50 PKR, because you must come back home from store on bus. Also, you aren't supposed to buy all the things you can skip anything you don't want.
Draw a flowchart for this problem, Have a good movie.

## Task 20:

Write a pseudo code that takes a number input from user and prints your name that times.

Dry run your pseudo code on any of 3 inputs of your choice.

## Task 21:

Draw a flowchart that takes a number input from user and prints all the prime numbers from 1 to the number user entered.

Dry run your flowchart on following inputs:
- If user enters 10
- If user enters 15
- If user enters 5

## Task 22:

Write a pseudo code that takes a number input from user and calculates the sum of all the even and odd numbers. After finding both sums, it must print both sums.

Dry run your pseudo code on following inputs:
- If user enters 10
- If user enters 15
- If user enters 5

## Task 23:

Draw a flowchart for a vending machine to be installed in FAST-NU.
- Vending machine has 20 cokes, 20 sprites, and 20 freshers of total supply, everything costs same price $5.
- User should input what he/she wants to drink or exit the machine menu.
- If user selects any drink, you must change the count of selected drink from total supply and maintain user bill.
- If user wants to exit you must print the bill of user and a message of "goodbye".

## Task 24:

Draw a flowchart that takes a number input from user and print the number of hours and minutes they are making. For example, if user enters 72, your program should print 1 hour and 12 minutes.

Dry run your flowchart on following inputs:
- If user enters 120.
- If user enters 250.
- If user enters 30.

## Task 25:
Draw a flowchart that takes a 4-digit number input from user and tells if it's palindrome or not.
A palindrome number is a number whose reverse is the same. For example, 1221, 1111

Dry run your flowchart on following inputs:
- If user enters 1411
- If user enters 6996
- If user enters 1096
- Also test your flowchart on given examples.

## Task 26:
Draw a flowchart that takes 3-digit number input from user and print out the sum of all its digits.
For example, if user enters 123, it should print 6.

Dry run your flowchart on any of 3 inputs you want.

## Task 27:
Write a pseudo code that takes a number input from user and finds the factorial of that number.

Dry run your pseudo code on any 5 inputs of your choice.

## Task 28:
Draw a flowchart that takes a number input from user and tells whether it's a strong number or not.
A strong number is a number which is equal to the sumo of factorial of its digits. For example,
145 is a strong number because $145 = 1! + 4! + 5!$

## Task 29:
Draw a flowchart that takes a number input from user and prints Fibonacci series of the input
length. Fibonacci series is in which next number is sum of last two numbers. For example,
0,1,1,2,3,5,8,13,21……….

Dry run your flowchart and print Fibonacci series of length 10 and 20.

## Task 30:

Draw a flowchart which takes a number input and print a triangle pattern of that size.
For example, if user entered 5:

```
*
**
***
****
*****
```

Do not hardcode this, use loops and also test it on following inputs:
- 7
- 3
- 10

*Best of lucks*