

Department of Computer Science and Engineering (AI and ML) and Computer Science and Engineering (Cyber Security)

Assignment #1

Due date:18 July 2022

1. Write a program to calculate a student's result based on two examinations, one sports event, and three activities conducted. The weightage of activities=30%, sports=20% and examination =50%.
2. Program to read an integer Displaying decimal, octal and Hexadecimal form.
3. Program to read a floating-point value in exponential format with the specifications:
 - a. correct to two decimal places
 - b. correct to four decimal places
 - c. correct to eight decimal places
4. Program to print the count of even numbers between 1 and 200. Also print their sum.
5. Program to read two floating point numbers. Add these numbers and assign the result to an integer. Finally display the value of all the three variables.
6. Write a c program to read a floating-point number. Display the rightmost digit of the integral part of the number.
7. Write a program to prepare a grocery bill. For that enter the name of the items purchased, quantity in which it is purchased and its price per unit. Then display the bill in the following format.
*****B I L L *****

Item	Quantity	Price	Amount
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Total Amount to be paid:_____

8. Write a program to print the prime factors of a number.
9. Write a program to test if a given number is a power of 2.
Hint: a number x is a power of 2 if $x \neq 0$ and $x \& (x-1) == 0$
10. Write a program to print the Floyd's triangle.
11. Write a program to read two numbers. Then find out whether the first number is a multiple of the second number.
12. Write a program using switch case to display a menu that offers 5 options: read three numbers, calculate total, calculate average, display the smallest and display the largest value.
13. Write a program to display the $\sin(x)$ value where x ranges from 0 to 360 in steps of 15
The formula used to express the $\sin(x)$ as Sine Series is

$$\sin x = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!}$$

Expanding the above notation, the formula of Sine Series is

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

14. Write a program to calculate electricity bill based on the following information:

Consumption (units)	Rate of charge
0-150	Rs 3 per unit
151-350	Rs.100 plus Rs. 3.75 per unit exceeding 150 units.
351-450	Rs. 250 plus Rs. 4 per unit exceeding 350 units
451-600	Rs. 300 plus Rs. 4.25 per unit exceeding 450 units
Above 600	Rs. 400 plus Rs. 5 per unit exceeding 600 units

15. Write a program to read an angle from the user and then display its quadrant.
16. Write a program that accepts the current date and the date of birth of ten user. Then calculate the age of the user and display it on the screen. Note that the date should be displayed in the format specified as dd/mm/yy.
17. A class has 50 students. Every student is supposed to give three examinations. Write a program to read the marks obtained by each student in all three examinations. Calculate and display the total marks and average of each student in the class.
18. Write a program in which the control variable is updated in the statement of the for loop
19. Write a program which demonstrates the use of go to, break and continue statements.
20. Write a program that displays all the numbers from 1 to 100 that are not divisible by 2 as well as by 3
21. Write a program to calculate parking charges of a vehicle. Enter the type of vehicle as a character (like c for car, b for bus etc.,) and number of hours then calculate charges as given below:
- truck/bus-20 Rs per hour
 - car-10 Rs per hour
 - scooter/cycle/motor cycle-5 Rs per hour
22. Write a program to print the following pattern:

```

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

23. Write a program to print the following pattern:

```
1
22
333
4444
555555
```

24. Write a program to print the following pattern:

```
1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
```

25. Write a program using for loop to calculate the value of an investment, given the initial value of investment and annual interest. Calculate the value of investment over a period of time.

26. Evaluate the following expressions

- $x = 18 - 12 / 3 + 3 * 5 - 1$
- $x = 18 - 12 / (3 + 3) * (5 - 1)$
- $x = a - b / 3 + c * 2 - 1$; where $a = 6, b = 7, c = 8$
- $y = a - b / (3 + c) * (2 - 1)$;
- $z = a - (b / (3 + c) * 2) - 1$;
- $x = a - --b / (3 + c++) * (2 - 1)$;
- $x = c + 2 * ((b \% 5) * (4 + (a - 3) / (c + 2)))$ where $a = 6, b = 19, c = 10$.

27. Write a C Program to Find the sum of digits of a number until the sum becomes single digit and count the number of digits in a number. Given a positive integer N. Write a C program to

- check if the number is **prime or not**.
- find all the prime numbers in the given range($N=100$).

28. Given an array of Integers of Size N, the task is to develop a C Program:

- To find the sum of all the positive number
- To find Smallest of all Numbers in the array
- To Find Average of all Numbers in the array
- To find the count of positive numbers and negative numbers in the array

29. Given a list of numbers, the task is to write a C program to find the second largest number in the given list.

30. Design a simple calculator using switch statement in C Programming language and display the following message and choice for the user.

```
Welcome to Simple Calculator using C
Available Operations:
+ for Addition
- for Subtraction
* for multiplication
/ for division
% for remainder
^ for Power of a Number (Use pow()function in Math.h)
~ for Square Root of a Number
```