Session: July- Dec 2024
B.Tech I-Sem Section-E
Computer Programming (CSE104): Assignment-1

Important Instructions: All must solve the following questions on a separate assignment copy and submit it by **Friday**, i.e. **07-11-24**, without fail.

1. WAP in C to check whether a given number is a perfect number or not.

Problem Description: A perfect number is a positive integer that is equal to the sum of its proper positive divisors, that is, the sum of its positive divisors excluding the number itself (also known as its aliquot sum). Equivalently, a perfect number is a number that is half the sum of all of its positive divisors (including itself).

Example: The first perfect number is 6 because 1, 2, and 3 are its proper positive divisors, and 1 + 2 + 3 = 6. Equivalently, 6 equals half the sum of all its positive divisors: (1 + 2 + 3 + 6) / 2 = 6.
The next perfect number is 28 = 1 + 2 + 4 + 7 + 14.
This is followed by the perfect numbers 496 and 8128
Inputs: A positive integer says 'N'. Where N < 220
Sample Execution / Output:

- Test Case 1: Positive Numbers
- Test Case 2: Positive Numbers
- Test Case 3: Negative Number

2. Given the number from 1 to 365, WAP in C to find which day of the year

Problem Description: Suppose, in a week, the first day is 'Sunday', the second day is 'Monday', and so on. If the first day is 'Monday', the second day will be 'Tuesday', and so on.

Inputs: Positive integer say 'N'. Where 1 <= 'N' <= 365. Option to set the first day.
Sample Execution / Output: Day based on N and First Day.

3. Write a program to read 3 numbers a, r, n, Generate AP, GP, HP
Problem Description: In mathematics, an Arithmetic Progression (AP) is a sequence of numbers such that the difference between consecutive terms is constant. For instance, the sequence 5, 7, 9, 11, 13, 15 … is an arithmetic progression with a common difference 2.
A Geometric Progression (GP) is a sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio. For example, the sequence 2, 6, 18, 54, … is a geometric progression with a common ratio of 3. Similarly, 10, 5, 2.5, 1.25, … is a geometric sequence with a common ratio of 1/2.
A Harmonic Progression (HP) is a progression formed by taking the reciprocals of an arithmetic progression.

Inputs: Positive integers say 'A', 'R' and 'N' Where:

- A = First number
- R = Common difference (AP & HP), Common ratio (GP)
- N = number of terms

4. To check whether a given number is even or odd using bitwise operators.

5. Print the following patterns

1 **2 3 2** **3 4 5 4 3** **4 5 6 7 6 5 4** **5 6 7 8 9 8 7 6 5**	**1 2 3 4 5 4 3 2 1** **1 2 3 4 3 2 1** **1 2 3 2 1** **1 2 1** **1** (ii)