**TASK SHEET 1**

**Problem 1:**

Write a simple calculator program that takes two numbers and an operator (+, -, \*, /) as input from the user and performs the corresponding operation.

**Problem 2:**

Write a Python program that takes a list of numbers and outputs a new list containing only the even numbers from the original list.

Example:

Enter a list of numbers separated by spaces: 1 2 3 4 5 6

Even numbers: [2, 4, 6]

**Problem 3:**

Given an integer,n, perform the following conditional actions:

* If n is odd, print Weird
* If n is even and in the inclusive range of 2 to 5, print Not Weird
* If n is even and in the inclusive range of 6 to 20, print Weird
* If n is even and greater than 20, print Not Weird

Example:

n = 3

Output = Weird

**Problem 4:**

Consider a list (list = []). You can perform the following commands:

1. insert i, e: Insert integer e at position i.
2. print: Print the list.
3. remove e: Delete the first occurrence of integer e.
4. append e: Insert integer e at the end of the list.
5. sort: Sort the list.
6. pop: Pop the last element from the list.
7. reverse: Reverse the list.

Initialize your list and read in the value of n followed by n lines of commands where each command will be of the 7 types listed above. Iterate through each command in order and perform the corresponding operation on your list.

**Sample input**

12

insert 0 5

insert 1 10

insert 0 6

print

remove 6

append 9

append 1

sort

print

pop

reverse

print

**Example**

N = 4

append 1

append 2

insert 3 1

print

* append 1: Append 1 to the list, arr = [1].
* append 2: Append 2 to the list, arr = [1, 2].
* insert 3 1: Insert 3 at index 1,arr = [1, 3, 2].
* print: Print the array.

Output = [1, 3, 2]

**Problem 5:**

The included code stub will read an integer, n, from STDIN. Without using any string methods, try to print the following: 123……..n

Note that "..." represents the consecutive values in between.

### ****Example****

n = 5

Print the string 12345 .

### ****Input Format****

The first line contains an integer n.

### ****Output Format****

Print the list of integers from 1 through n as a string, without spaces.

**Problem 6:**

An extra day is added to the calendar almost every four years as February 29, and the day is called a leap day. It corrects the calendar for the fact that our planet takes approximately 365.25 days to orbit the sun. A leap year contains a leap day.

In the Gregorian calendar, three conditions are used to identify leap years:

The year can be evenly divided by 4, is a leap year, unless:

oThe year can be evenly divided by 100, it is NOT a leap year, unless:

The year is also evenly divisible by 400. Then it is a leap year.

This means that in the Gregorian calendar, the years 2000 and 2400 are leap years, while 1800, 1900, 2100, 2200, 2300 and 2500 are NOT leap years.

Task

Given a year, determine whether it is a leap year. If it is a leap year, return the Boolean True, otherwise return False.

Input Format:

year

Output Format:

The function must return a Boolean value (True/False).

**Problem 7:**

Task

Given the participants’ score sheet for your University Sports Day, you must find the runner-up score. You are given n scores. Store them in a list and find the score of the runner-up.

Input Format

The first line contains n. The second line contains an array A[] of n integers are each separated by a space.

Sample output:

5

2 3 6 6 5

Sample input:

5

**Problem 8:**

Task

Given an integer, n, print the following values for each integer i from 1 to n:

Decimal

Octal

Hexadecimal (capitalized)

Binary

Prints

The four values must be printed on a single line in the order specified above for each i from 1 to number. Each value should be space-padded to match the width of the binary value of number and the values should be separated by a single space.

Input Format

A single integer denoting n.

Example:

Input

17

Output

1 1 1 1

2 2 2 10

3 3 3 11

4 4 4 100

5 5 5 101

6 6 6 110

7 7 7 111

8 10 8 1000

9 11 9 1001

10 12 A 1010

11 13 B 1011

12 14 C 1100

13 15 D 1101

14 16 E 1110

15 17 F 1111

16 20 10 10000

17 21 11 10001

**Problem 9:**

Write a Python function that takes two matrices as input and returns their product if multiplication is possible, and None otherwise. Make sure to handle matrix dimensions correctly.

**Problem 10:**

Write a Python function to generate the Fibonacci sequence up to a given number n. The Fibonacci sequence is defined as follows: each number is the sum of the two preceding ones, starting from 0 and 1.