UNITED INTERNATIONAL UNIVERSITY

Department of Computer Science and Engineering (CSE)

Assignment-01

Course: AI Lab **Course Code: CSE 3812**

Trimester & Year: Summer 25 **Section: A**

SN	Questions
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Statement

You are given an integer N. Your task is to determine:

1. Whether N is even or odd.
2. Whether N is positive, negative, or zero.

Input:

- The input consists of a single integer **N**

Output:

Print two lines:

- The first line should be **"EVEN"** if **N** is even and **"ODD"** if **N** is odd.
- The second line should be:
  - **"POSITIVE"** if **N** > 0
  - **"NEGATIVE"** if **N** < 0
  - **"ZERO"** if **N** = 0

Sample Input	Sample Output
5	ODD POSITIVE
-6	EVEN NEGATIVE

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Statement

A class has **5 students**. Each student has marks in **3 subjects**: Math, Science, and English. Your task is to calculate the **total marks, average, and grade** for each student based on the following grading scale:

- **90-100:** A+
- **80-89:** A
- **70-79:** B
- **60-69:** C
- **Below 60:** F

Input:

- The input consists of **5 lines**, each containing a student's name followed by three integers representing marks in Math, Science, and English.

  Each mark is between **0 and 100**.

Output:

- For each student, print the **total marks, average (rounded to 2 decimal places), and grade** in the format:

  Student_Name: Total=total_marks, Average=average_marks, Grade=grade

Constraints

The time complexity of your solution must not exceed **O(n)**.

Sample Input	Sample Output
Alice 85 90 78 Bob 50 60 45 Charlie 92 88 95 David 70 72 75 Eve 88 85 89	Alice: Total=253, Average=84.33, Grade=A Bob: Total=155, Average=51.67, Grade=F Charlie: Total=275, Average=91.67, Grade=A+ David: Total=217, Average=72.33, Grade=B Eve: Total=262, Average=87.33, Grade=A

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Statement

Given an integer **N**, compute the **first N Fibonacci numbers** using a recursive function.

Input:

- A single integer N

Output:

- Print the first **N Fibonacci numbers** separated by spaces.

Sample Input	Sample Output
5	0 1 1 2 3
10	0 1 1 2 3 5 8 13 21 34

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Statement

You are given a paragraph of text containing multiple words. Your task is to count the **number of unique words** present in the paragraph.

Input:

- A single line containing a paragraph of text **(1 ≤ length ≤ 1000 characters)**. Words are separated by spaces, and punctuation should be ignored.

Output:

- Print a single integer representing the **count of unique words**.

Sample Input	Sample Output
Python is great. Python is powerful, and Python is easy to learn!	8

Hint:

- Use a **set** to store unique words.
- Convert words to **lowercase** and remove punctuation before adding to the set.

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Statement

You are given a sentence. Your task is to **count the frequency of each word** in the sentence and print the results in descending order of frequency.

Input:

- A single line containing a **sentence** *(1 ≤ length ≤ 500 characters)*. Words are case-insensitive (treat `"Python"` and `"python"` as the same word).

Output:

- Print each word and its frequency, sorted in **descending order**.
- If two words have the same frequency, print them in **alphabetical order**.

Sample Input	Sample Output
Python is fun. Python is powerful! Python makes programming fun.	python 3 fun 2 is 2 makes 1 powerful 1 programming 1

Hint:

- Use a **dictionary** to store word frequencies.
- Convert all words to **lowercase** before counting.
- Remove punctuation.

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Statement

Given two lists of integers, find the **common elements** between them **without duplicates** and print them in **sorted order**.

Input:

- The first line contains an integer **N** *(1 ≤ N ≤ 1000)*, the size of the first list.
- The second line contains **N** space-separated integers.
- The third line contains an integer **M** *(1 ≤ M ≤ 1000)*, the size of the second list.
- The fourth line contains **M** space-separated integers.

Output:

- Print the sorted list of **common elements** in ascending order. If there are no common elements, print `"No common elements"`.

Sample Input	Sample Output
5 1 3 5 7 9 6 2 3 5 7 11 13	3 5 7
4 1 2 3 4 3 5 6 7	No common elements