DAY 1 – AIML LAB

Program 1: Number Properties Analyzer

Write a program to input an integer and check:

- Whether it is **Prime**
- Whether it is **Palindrome**
- Whether it is **Armstrong**

Use separate functions for each check.

Program 2: List Statistics Without Built-ins

Given a list of integers:

- Find **maximum**, **minimum**
- Compute **mean**
- Compute **median**

Do **not** use built-in functions like `max()`, `min()`, `sorted()`

Program 3: Word Frequency Counter

Given a sentence:

- Remove punctuation
- Convert to lowercase
- Count frequency of each word using a **dictionary**
- Display words sorted by frequency (descending)

Program 4: Student Performance Analyzer

Input student marks in **5 subjects** for *n* students and:

- Calculate total & average
- Assign grades using conditions
- Display topper(s)

Store data using **nested lists or dictionaries**.

Program 5: Recursive vs Iterative Fibonacci

Implement Fibonacci:

1. Using **recursion**
2. Using **iteration**

Compare execution time for `n = 30`.

Program 6: Matrix Operations Using Lists

Create two matrices using lists and perform:

- Matrix addition
- Matrix transpose

Do **not** use NumPy.

Program 7: File-Based Data Summary

- Read integers from a text file
- Handle missing or invalid data using `try-except`
- Output:
    - Count
    - Mean
    - Max & Min

Program 8: Simple Linear Search vs Binary Search

- Implement both algorithms
- Compare number of comparisons