Lab 01 Tasks

In-Lab Tasks

The local community center is organizing a series of events and has asked your team to help collect and process data efficiently. Complete the following tasks:

1. **Task 1: Register Event Participants**

   Write a program to collect the names of participants for two events. Each event can have a maximum of 5 participants. Store the names in two separate arrays.

2. **Task 2: Attendance Checker**

   Add functionality to check if a particular participant is registered in either of the two events. Prompt the user to enter a name and display the result.

3. **Task 3: Calculate Total Donations**

   Each participant donates a fixed amount of $10 to attend the event. Write a program to calculate the total donation amount collected from both events.

4. **Task 4: Display Participant Names in Reverse**

   Display the names of participants in reverse order (for each event separately).

5. **Task 5: Event Popularity Bar Chart**

   Create a simple bar chart to visualize the number of participants for each event. Use * for each participant.

Take-Home Tasks

An environmental organization is conducting research on air quality and wants you to write a program to process their data. Complete the following tasks:

1. **Task 1: Weekly Air Quality Index (AQI) Tracker**

   Write a program to record the AQI for 4 cities over 7 days using a 2D array. Input the AQI values for each city and each day.

   - Calculate and display the average AQI for each city over the week.
   - Identify the city with the worst air quality (highest average AQI).

2. **Task 2: Identify Critical Pollution Days**

   Add functionality to identify days where the AQI exceeded 150 for any city (critical pollution days). Display these days for each city.

3. **Task 3: Data Visualization**

   Generate a visual representation of AQI levels for each city over the week. For example, display * symbols where each * represents an AQI increment of 50.

4. **Task 4: Monthly AQI Comparison**

   Extend the program to include data for an entire month (28 days).

   - Calculate the overall monthly average AQI for each city.
   - Identify the city with the most improved air quality (largest drop in weekly averages between the first and last weeks).

5. **Task 5: Generate a Report**

   Summarize the findings in a detailed report. Include:

   - Weekly averages for each city.
   - Critical pollution days for each city.
   - A comparison of the highest and lowest AQI values recorded during the month.