

WEAK 1

LAB TASK's:

```
#include<iostream>
#include<string>
using namespace std;

void getname(string participants[], int max, int &total){
    int n;
    cout<<"how many members are joining"<<endl;
    cin>>n;
    if(n<=max){
        total+=n;
        string name;
        for(int i=0;i<n;i++){
            cout<<"enter the name of"<<i+1<<"name"<<endl;
            getline(cin,name);
            participants[i]=name;
        }
    }
}

bool check(string participants[],int total,string &name){
    for(int i=0;i<total;i++){
        if(participants[i]==name){
            return true;
        }
    }
    return false;
}

int donation(int totalE1,int totalE2){
    int total=totalE1+totalE2, amount=10,events=2;
    return total*amount*events;
}

void display(string participants[],int total){
    for(int i=total-1;i>=0;i--){
        cout<<participants[i]<<endl;
    }
}
```

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    }
}

void chart( int total){
    for(int i=0;i<total;i++){
        cout<<"*";
    }
    cout<<endl;
}

int main(){
    int max =5,totalE1=0,totalE2=0;
    string E1_participants[max],E2_participants[max];

    //getting names of participants for event1
    getname(E1_participants,max,totalE1);

    //getting names of participants for event2
    getname(E2_participants,max,totalE2);

    string name;
    cout<<"enter the name";
    getline(cin,name);

    bool attendace=check(E1_participants,totalE1,name);
    bool attendace2=check(E2_participants,totalE2,name);
    if(attendace||attendace2){
        cout<<"the name is registered for one of the event"<<endl;
    }
    else{
        cout<<"the name is not registered for event"<<endl;
    }

    int price=donation(totalE1,totalE2);
    cout<<"the donation we got is:"<<price<<endl;

    //displaying the name of participants of event1
    display(E1_participants,totalE1);
    //displaying the name of participants of event2
    display(E2_participants,totalE2);

    cout<<"chart of event1"<<endl;chart(totalE1);
    cout<<"chart of event2"<<endl;chart(totalE2);
}

```

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return 0;
1
cd "/Users/kabir/Desktop/kabir/OOP 2nd sem/" && g++ practice.cpp -o p
kabir@kabirs-MacBook-Pro OOP 2nd sem % cd "/Users/kabir/Desktop/kabir,
sem/"practice
how many members are joining
3
enter the name of1name
enter the name of2name
kabir
enter the name of3name
abdullah
how many members are joining
4
enter the name of1name
enter the name of2name
abdullah
enter the name of3name
shivam
enter the name of4name
rameez
enter the nameabdullah
the name is registered for one of the event
the donation we got is:140
abdullah
kabir

rameez
shivam
abdullah

chart of event1
***
chart of event2
****
kabir@kabirs-MacBook-Pro OOP 2nd sem %

```

HOME TASK's:

```
#include <iostream>
```

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#include <iomanip>

using namespace std;

const int NUM_CITIES = 4;
const int DAYS_IN_WEEK = 7;
const int DAYS_IN_MONTH = 28;

void inputAOI(int aqi[NUM_CITIES][DAYS_IN_MONTH], int days) {
    for (int city = 0; city < NUM_CITIES; ++city) {
        cout << "Enter AQI values for City " << city + 1 << ":\n";
        for (int day = 0; day < days; ++day) {
            cout << "Day " << day + 1 << ": ";
            cin >> aqi[city][day];
        }
    }
}

void calculateAverageAOI(int aqi[NUM_CITIES][DAYS_IN_MONTH], int days, double
cityAverages[]) {
    for (int city = 0; city < NUM_CITIES; ++city) {
        double sum = 0;
        for (int day = 0; day < days; ++day) {
            sum += aqi[city][day];
        }
        cityAverages[city] = sum / days;
    }
}

int findWorstCity(double cityAverages[]) {
    int worstCity = 0;
    double worstAQI = cityAverages[0];
    for (int i = 1; i < NUM_CITIES; ++i) {
        if (cityAverages[i] > worstAQI) {
            worstCity = i;
            worstAQI = cityAverages[i];
        }
    }
    return worstCity;
}

void checkCriticalPollution(int aqi[NUM_CITIES][DAYS_IN_MONTH], int days) {

```

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    cout << "\nDays with Critical Pollution (AQI > 150):\n";
    for (int city = 0; city < NUM_CITIES; ++city) {
        cout << "City " << city + 1 << ": ";
        bool hasCritical = false;
        for (int day = 0; day < days; ++day) {
            if (aqi[city][day] > 150) {
                cout << "Day " << day + 1 << " (" << aqi[city][day] << ") ";
                hasCritical = true;
            }
        }
        if (!hasCritical) {
            cout << "None";
        }
        cout << endl;
    }
}

void visualizeAQI(int aqi[NUM_CITIES][DAYS_IN_MONTH], int days) {
    cout << "\nAQI Data Visualization (* = 50):\n";
    for (int city = 0; city < NUM_CITIES; ++city) {
        for (int day = 0; day < days; ++day) {
            cout << "City " << city + 1 << ", Day " << day + 1 << ": ";
            int stars = aqi[city][day] / 50;
            for (int i = 0; i < stars; ++i) {
                cout << "*";
            }
            cout << " (" << aqi[city][day] << ")\n";
        }
        cout << endl;
    }
}

void calculateMonthlyAverages(int aqi[NUM_CITIES][DAYS_IN_MONTH], double
cityAverages[], double firstWeekAvg[], double lastWeekAvg[]) {
    for (int city = 0; city < NUM_CITIES; ++city) {
        double sum = 0;
        for (int day = 0; day < DAYS_IN_MONTH; ++day) {
            sum += aqi[city][day];
            if (day < DAYS_IN_WEEK) {
                firstWeekAvg[city] += aqi[city][day];
            }
            if (day >= DAYS_IN_MONTH - DAYS_IN_WEEK) {

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        lastWeekAvg[city] += aqi[city][day];
    }
}

cityAverages[city] = sum / DAYS_IN_MONTH;
firstWeekAvg[city] /= DAYS_IN_WEEK;
lastWeekAvg[city] /= DAYS_IN_WEEK;
}
}

void findCityWithMostImprovement(double firstWeekAvg[], double lastWeekAvg[]) {
    int cityWithMostImprovement = 0;
    double maxImprovement = firstWeekAvg[0] - lastWeekAvg[0];

    for (int city = 1; city < NUM_CITIES; ++city) {
        double improvement = firstWeekAvg[city] - lastWeekAvg[city];
        if (improvement > maxImprovement) {
            maxImprovement = improvement;
            cityWithMostImprovement = city;
        }
    }

    cout << "\nCity with the most improved air quality: City " <<
cityWithMostImprovement + 1
        << " (Improvement: " << maxImprovement << " AQI points)\n";
}

void generateReport(int aqi[NUM_CITIES][DAYS_IN_MONTH], int days) {
    double cityAverages[NUM_CITIES] = {0};
    double firstWeekAvg[NUM_CITIES] = {0};
    double lastWeekAvg[NUM_CITIES] = {0};

    calculateAverageAQI(aqi, days, cityAverages);
    calculateMonthlyAverages(aqi, cityAverages, firstWeekAvg, lastWeekAvg);

    cout << "\n--- AOI Report ---\n";
    cout << "Weekly Averages:\n";
    for (int city = 0; city < NUM_CITIES; ++city) {
        cout << "City " << city + 1 << ": " << setprecision(2) << fixed <<
cityAverages[city] << endl;
    }

    checkCriticalPollution(aqi, days);
}

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    visualizeAQI(aqi, days);

    findCityWithMostImprovement(firstWeekAvg, lastWeekAvg);

    cout << "\nComparison of Highest and Lowest AQI values:\n";
    for (int city = 0; city < NUM_CITIES; ++city) {
        int highest = aqi[city][0], lowest = aqi[city][0];
        for (int day = 1; day < days; ++day) {
            if (aqi[city][day] > highest) highest = aqi[city][day];
            if (aqi[city][day] < lowest) lowest = aqi[city][day];
        }
        cout << "City " << city + 1 << " - Highest AQI: " << highest << ", Lowest AQI: " << lowest << endl;
    }
}

int main() {
    int aqi[NUM_CITIES][DAYS_IN_MONTH];

    cout << "Enter AQI values for a week:\n";
    inputAQI(aqi, DAYS_IN_WEEK);

    double weeklyAverages[NUM_CITIES] = {0};
    calculateAverageAQI(aqi, DAYS_IN_WEEK, weeklyAverages);
    checkCriticalPollution(aqi, DAYS_IN_WEEK);
    visualizeAQI(aqi, DAYS_IN_WEEK);

    cout << "\nEnter AQI data for the full month:\n";
    inputAQI(aqi, DAYS_IN_MONTH);
    generateReport(aqi, DAYS_IN_MONTH);

    return 0;
}

```

```
cd "/Users/kabir/Desktop/kabir/00P 2nd se
kabir@kabirs-MacBook-Pro 00P 2nd sem % cd
d sem/"practice2
Enter AQI value for a week:
Enter AQI values for city 1
Day 1
3
Day 2
34
Day 3
34
Day 4
2
Day 5
3
Day 6
4
Day 7
6
Enter AQI values for city 2
Day 1
34
Day 2
4
Day 3
2
Day 4
5
Day 5
6
Day 6
75
Day 7
4
Enter AQI values for city 3
Day 1
4
Day 2
3
Day 3
55
Day 4
4
```


4
Day 4
5
Day 5
54
Day 6

5
Day 7
4

Average AQI for each city:

City 1: 12.2857

City 2: 18.5714

City 3: 18.7143

City 4: 15.8571

City with the worst air quality: 3 (AQI: 18.7143)

None of the cities have critical pollution

None of the cities have critical pollution

None of the cities have critical pollution

None of the cities have critical pollution

AQI Data Visualization (* = 50):

Day 1: (3)

Day 2: (34)

Day 3: (34)

Day 4: (2)

Day 5: (3)

Day 6: (4)

Day 7: (6)

Day 1: (34)

Day 2: (4)

Day 3: (2)

Day 4: (5)

Day 5: (6)

Day 6: * (75)

Day 7: (4)

Day 1: (4)

Day 2: (3)

Day 3: * (55)

Day 4: (4)

Day 5: * (54)

Day 6: (5)

Day 7: (6)

Day 1: (4)

Day 2: (35)

Day 3: (4)

Day 4: (5)

Day 2: (35)
Day 3: (4)
Day 4: (5)
Day 5: * (54)
Day 6: (5)
Day 7: (4)

Enter AQI data for the full month:

Enter AQI values for city 1

Day 1

54

Day 2

5

Day 3

4

Day 4

4

4Day 5

Day 6

43

Day 7

4

Day 8

4

Day 9

4

Day 10

4

Day 11

4

Day 12

4

Day 13

4

Day 14

4

Day 15

5

Day 16

5

Day 17

6

Day 18

6

Day 19

7

Day 20

7

Day 21

Day 21

7

Day 22

8

Day 23

8

Day 24

3

Day 25

3

Day 26

4

Day 27

45

Day 28

5

Enter AQI values for city 2

Day 1

5

Day 2

44

Day 3

5

Day 4

5

Day 5

66

Day 6

77

Day 7

54

Day 8

56

Day 9

5

Day 10

56

56
Day 11
6
Day 12
54
Day 13
5
Day 14
65
Day 15
4
Day 16
5
Day 17
64
Day 18
56
Day 19

45
Day 20
6
Day 21

56
Day 22

4
Day 23
6
Day 24
5
Day 25
5
Day 26
65
Day 27

6
Day 28

54456
Enter AQI values for city 3
Day 1

56
Day 2

Day 3

56

Day 4

56

Day 5

4

Day 6

5

Day 7

4

Day 8

56

Day 9

78

Day 10

7654345

Day 11

678

Day 12

765

Day 13

4

Day 14

56

Day 15

8

Day 16

54678

Day 17

65

Day 18

45678

Day 19

6543

```
75
Day 28
6
Enter AQI values for city 4
Day 1
7
Day 2
7
Day 3
6
Day 4
5
Day 5
4
Day 6

8
Day 7

765
Day 8
4
Day 9

8
Day 10
765
Day 11

6
Day 12
7654
Day 13
6
Day 14
89
Day 15
876
Day 16
54
Day 17
8
Day 18
7654
Day 19

87
Day 20
654
Day 21
```

```
Day 23
765
Day 24
4
Day 25

8
Day 26
6
Day 27
5
Day 28

765

Monthly AQI Averages:
City 1 have monthly average of 9.46429
City 2 have monthly average of 1974.5
City 3 have monthly average of 472708
City 4 have monthly average of 722.643

City with the most improved air quality: 1 (Improvement: 6 AQI points)

Average AQI for each city:
City 1: 9.46429
City 2: 1974.5
City 3: 472708
City 4: 722.643

City with the worst air quality: 3 (AQI: 472708)

--- AQI Report ---
Weekly Averages:
City 1 have avg of: 9.46429
City 2 have avg of: 1974.5
City 3 have avg of: 472708
City 4 have avg of: 722.643
None of the cities have critical pollution
Day 28 (AQI: 54456)
Day 10 (AQI: 7654345) Day 11 (AQI: 678) Day 12 (AQI: 765) Day 16 (AQI: 54678) Day 18 (AQI: 45678) Day 19 (AQI: 6543) Day 20 (AQI: 4567) Day 21 (AQI:
6543) Day 22 (AQI: 4567) Day 26 (AQI: 5456787)
Day 7 (AQI: 765) Day 10 (AQI: 765) Day 12 (AQI: 7654) Day 15 (AQI: 876) Day 18 (AQI: 7654) Day 20 (AQI: 654) Day 23 (AQI: 765) Day 28 (AQI: 765)

Comparison of Highest and Lowest AQI values:
City 1 - Highest AQI: 54, Lowest AQI: 3
City 2 - Highest AQI: 54456, Lowest AQI: 4
City 3 - Highest AQI: 7654345, Lowest AQI: 4
City 4 - Highest AQI: 7654, Lowest AQI: 4
kabir@kabirs-MacBook-Pro 00P 2nd sem % 4
zsh: command not found: 4
kabir@kabirs-MacBook-Pro 00P 2nd sem %
```