**OPEN ENDED EXPERIMENT**

**OBJECT ORIENTED PROGRAMMING USING C++**

**ES203**

![Logo

Description automatically generated]()

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**PROGRAM**

**AIM**

1. A proposal of construction of toll bridge between Delhi to Jaipur is passed by the govt. of India. Contractors published tender notice for the same in newspaper with following requirements. Toll bridge should start from midnight 12.00 AM till next day midnight 12.00 AM. Each vehicle record will be recorded date wise in each direction as follows.

 1. Count of 4 wheelers and amount paid by the 4 wheelers is Rs 500 two way and Rs 350 for one way.

2. Count of 2 wheelers and amount paid by the 2 wheelers is Rs 350 two way and Rs 200 for one way.

By the end of the day, this count of (4 wheelers as well as 2 wheelers) passed the toll bridge and the amount to be paid in their subcategory is to be submitted to traffic control office. The details of the same i.e. details of the collection along with the vehicle details date wise need to be saved in the file also. The code should have searching mechanism also to identify the details of the movement of the vehicle through that toll gate in last 1 week. Design an efficient code for the particular scenario.

**SOURCE CODE**

#include<iostream>

#include<string>

#include<fstream>

using namespace std;

class vehicles

{

    public:

    static int counttwowheeler;

    static int countfourwheeler;

    string vehicle\_number;

    int way;

    int type;

    void details()

    {

        cout<<"Enter the Vehicle number: "<<endl;

        cin>>vehicle\_number;

        cout<<"Press 2 for two wheeler or 4 for four wheeler "<<endl;

        cin>>type;

        if (type==2)

        {

            counttwowheeler++;

        }

        else

        {

            countfourwheeler++;

        }

        cout<<"Press 1 for one way or 2 for two way"<<endl;

        cin>>way;

    }

};

int vehicles::countfourwheeler;

int vehicles::counttwowheeler;

class payment:public vehicles

{

    public:

    static int record;

    int tax;

    string date;

    void inputdate()

    {

        cout<<"Enter the date in the format: dd/mm/yyyy "<<endl;

        cin>>date;

    }

    void taxcalculator()

    {

        if (type==2 && way==1)

        {

            tax=200;

        }

        else if (type==2 && way ==2)

        {

            tax=350;

        }

        if (type==4 && way==1)

        {

            tax=350;

        }

        else if(type==4 && way==2)

        {

            tax=500;

        }

        record = record + tax;

    }

    void display()

    {

        cout<<"DATE is: "<<date<<endl;

        cout<<"VEHICLE NUMBER is"<<vehicle\_number<<endl;

        cout<<"VEHICLE TYPE is: "<<type <<endl;

        cout<<way<<"WAY"<<endl;

        cout<<"TAX PAIED is: "<<tax<<endl;

    }

};

int payment::record;

int day\_monday=0,day\_tuesday=0,day\_wednesday=0,day\_thursday=0,day\_friday=0,day\_saturday=0,day\_sunday=0;

int vehicle\_monday=0,vehicle\_tuesday=0,vehicle\_wednesday=0,vehicle\_thursday=0,vehicle\_friday=0,vehicle\_saturday=0,vehicle\_sunday=0;

int start, choice1, choice2, choice3, choice4;

int counter;

string number\_to\_be\_found;

payment monday[500];

payment tuesday[500];

payment wednesday[500];

payment thursday[500];

payment friday[500];

payment saturday[500];

payment sunday[500];

fstream file;

int main()

{

    file.open("record.txt",ios::out|ios::in|ios::app);

    do

    {

        cout<<"Enter your choice for the operation:"<<endl;

        cout<<"(1) for entry"<<endl;

        cout<<"(2) for display and writing data in file"<<endl;

        cout<<"(3) for searching a vehicle by its number"<<endl;

        cout<<"(4) for seeing the total collection at the end of each day"<<endl;

        cin>>choice1;

        switch (choice1)

        {

            case(1):

            cout<<"Enter (1) for monday entry"<<endl;

            cout<<"Enter (2) for tuesday entry"<<endl;

            cout<<"Enter (3) for wednesday entry"<<endl;

            cout<<"Enter (4) for thursday entry"<<endl;

            cout<<"Enter (5) for friday entry"<<endl;

            cout<<"Enter (6) for saturday entry"<<endl;

            cout<<"Enter (7) for sunday entry"<<endl;

            cin>>choice2;

            switch(choice2)

            {

                case (1):

                do

                {

                    monday[vehicle\_monday].details();

                    monday[vehicle\_monday].inputdate();

                    monday[vehicle\_monday].taxcalculator();

                    day\_monday=monday[vehicle\_monday].record;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_monday++;

                    }

                } while(counter==1);

                break;

                case (2):

                do

                {

                    tuesday[vehicle\_tuesday].details();

                    tuesday[vehicle\_tuesday].inputdate();

                    tuesday[vehicle\_tuesday].taxcalculator();

                    day\_tuesday=tuesday[vehicle\_tuesday].record-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_tuesday++;

                    }

                } while(counter==1);

                break;

                case (3):

                do

                {

                    wednesday[vehicle\_wednesday].details();

                    wednesday[vehicle\_wednesday].inputdate();

                    wednesday[vehicle\_wednesday].taxcalculator();

                    day\_wednesday=wednesday[vehicle\_wednesday].record-day\_tuesday-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_wednesday++;

                    }

                } while(counter==1);

                break;

                case (4):

                do

                {

                    thursday[vehicle\_thursday].details();

                    thursday[vehicle\_thursday].inputdate();

                    thursday[vehicle\_thursday].taxcalculator();

                    day\_thursday=thursday[vehicle\_thursday].record-day\_wednesday-day\_tuesday-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_thursday++;

                    }

                } while(counter==1);

                break;

                case (5):

                do

                {

                    friday[vehicle\_friday].details();

                    friday[vehicle\_friday].inputdate();

                    friday[vehicle\_friday].taxcalculator();

                    day\_friday=friday[vehicle\_friday].record-day\_thursday-day\_wednesday-day\_tuesday-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_friday++;

                    }

                } while(counter==1);

                break;

                case (6):

                do

                {

                    saturday[vehicle\_saturday].details();

                    saturday[vehicle\_saturday].inputdate();

                    saturday[vehicle\_saturday].taxcalculator();

                    day\_saturday=saturday[vehicle\_saturday].record-day\_friday-day\_thursday-day\_wednesday-day\_tuesday-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_saturday++;

                    }

                } while(counter==1);

                break;

                case (7):

                do

                {

                    sunday[vehicle\_sunday].details();

                    sunday[vehicle\_sunday].inputdate();

                    sunday[vehicle\_sunday].taxcalculator();

                    day\_sunday=sunday[vehicle\_sunday].record-day\_saturday-day\_friday-day\_thursday-day\_wednesday-day\_tuesday-day\_monday;

                    cout<<"Want to add new vehicle(1) want to exit (-1)"<<endl;

                    cin>>counter;

                    if(counter==1)

                    {

                        vehicle\_sunday++;

                    }

                } while(counter==1);

                break;

            }

            break;

            case (2):

            cout<<"Enter (1) for displaying and writing the data of monday in the file"<<endl;

            cout<<"Enter (2) for displaying and writing the data of tuesday in the file"<<endl;

            cout<<"Enter (3) for displaying and writing the data of wednesday in the file"<<endl;

            cout<<"Enter (4) for displaying and writing the data of thursday in the file"<<endl;

            cout<<"Enter (5) for displaying and writing the data of friday in the file"<<endl;

            cout<<"Enter (6) for displaying and writing the data of saturday in the file"<<endl;

            cout<<"Enter (7) for displaying and writing the data of sunday in the file"<<endl;

            cin>>choice3;

            if(choice3==1)

            {

                for (int i = 0; i <= vehicle\_monday; i++)

                {

                    monday[i].display();

                    file<<"DATE is: "<<monday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<monday[i].vehicle\_number<<endl;

                    file<<monday[i].type<<"wheeler"<<endl;

                    file<<monday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<monday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==2)

            {

                for (int i = 0; i <= vehicle\_tuesday; i++)

                {

                    tuesday[i].display();

                    file<<"DATE is: "<<tuesday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<tuesday[i].vehicle\_number<<endl;

                    file<<tuesday[i].type<<"wheeler"<<endl;

                    file<<tuesday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<tuesday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==3)

            {

                for (int i = 0; i <= vehicle\_wednesday; i++)

                {

                    wednesday[i].display();

                    file<<"DATE is: "<<wednesday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<wednesday[i].vehicle\_number<<endl;

                    file<<wednesday[i].type<<"wheeler"<<endl;

                    file<<wednesday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<wednesday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==4)

            {

                for (int i = 0; i <= vehicle\_thursday; i++)

                {

                    thursday[i].display();

                    file<<"DATE is: "<<thursday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<thursday[i].vehicle\_number<<endl;

                    file<<thursday[i].type<<"wheeler"<<endl;

                    file<<thursday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<thursday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==5)

            {

                for (int i = 0; i <= vehicle\_friday; i++)

                {

                    friday[i].display();

                    file<<"DATE is: "<<friday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<friday[i].vehicle\_number<<endl;

                    file<<friday[i].type<<"wheeler"<<endl;

                    file<<friday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<friday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==6)

            {

                for (int i = 0; i <= vehicle\_saturday; i++)

                {

                    saturday[i].display();

                    file<<"DATE is: "<<saturday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<saturday[i].vehicle\_number<<endl;

                    file<<saturday[i].type<<"wheeler"<<endl;

                    file<<saturday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<saturday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            if(choice3==7)

            {

                for (int i = 0; i <= vehicle\_sunday; i++)

                {

                    sunday[i].display();

                    file<<"DATE is: "<<sunday[i].date<<endl;

                    file<<"VEHICLE NUMBER is: "<<sunday[i].vehicle\_number<<endl;

                    file<<sunday[i].type<<"wheeler"<<endl;

                    file<<sunday[i].way <<"way"<<endl;

                    file<<"TAX PAID is: "<<sunday[i].tax<<endl<<endl;

                    file<<"\*\*\*\*\*\*\*\*\*";

                    file<<endl<<endl;

                }

            }

            break;

            case (3):

            cout<<"Enter the vehicle number for searching"<<endl;

            cin>>number\_to\_be\_found;

            for (int i = 0; i <= vehicle\_monday; i++)

            {

                if (monday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    monday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_tuesday; i++)

            {

                if (tuesday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    tuesday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_wednesday; i++)

            {

                if (wednesday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    wednesday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_thursday; i++)

            {

                if (thursday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    thursday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_friday; i++)

            {

                if (friday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    friday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_saturday; i++)

            {

                if (saturday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND"<<endl;

                    saturday[i].display();

                    break;

                }

            }

            for (int i = 0; i <= vehicle\_sunday; i++)

            {

                if (sunday[i].vehicle\_number==number\_to\_be\_found)

                {

                    cout<<"VEHICLE FOUND!!!"<<endl;

                    sunday[i].display();

                    break;

                }

            }

            break;

            case (4):

            cout<<"Enter (1) for monday collection"<<endl;

            cout<<"Enter (2) for tuesday collection"<<endl;

            cout<<"Enter (3) for wednesday collection"<<endl;

            cout<<"Enter (4) for thursday collection"<<endl;

            cout<<"Enter (5) for friday collection"<<endl;

            cout<<"Enter (6) for saturday collection"<<endl;

            cout<<"Enter (7) for sunday collection"<<endl;

            cin>>choice4;

            switch(choice4)

            {

                case(1):

                cout<<"The collection for monday is "<<day\_monday<<endl;

                break;

                case(2):

                cout<<"The collection for tuesday is "<<day\_tuesday<<endl;

                break;

                case(3):

                cout<<"The collection for wednesday is "<<day\_wednesday<<endl;

                break;

                case(4):

                cout<<"The collection for thursday is "<<day\_thursday<<endl;

                break;

                case(5):

                cout<<"The collection for friday is "<<day\_friday<<endl;

                break;

                case(6):

                cout<<"The collection for saturday is "<<day\_saturday<<endl;

                break;

                case(7):

                cout<<"The collection for sunday is "<<day\_sunday<<endl;

                break;

            }

        }

        cout<<"Press 1 for continuing or 0 for exit";

        cin>>start;

    } while (start==1);

    file.close();

    return 0;

}

**OUTPUT**

Graphical user interface, text

Description automatically generatedGraphical user interface, text

Description automatically generatedText

Description automatically generatedGraphical user interface, text

Description automatically generatedGraphical user interface, text

Description automatically generatedGraphical user interface, text, application

Description automatically generated

**FILE RECORD**

Text, application

Description automatically generatedGraphical user interface, application

Description automatically generated

**APPENDIX**

SOURCE CODE FOR ONLY ONE DAY COLLECTION DISPLAY ON CONSOLE

#include<iostream>

using namespace std;

class vehicles

{

    private:

    static int way;

    static int i;

    static char car\_number[100][50];

    static char date[100][10];

    static int count\_one\_way\_two\_wheeler;

    static int count\_two\_way\_two\_wheeler;

    static int count\_one\_way\_four\_wheeler;

    static int count\_two\_way\_four\_wheeler;

    static long tax\_one\_way\_two\_wheeler;

    static long tax\_two\_way\_two\_wheeler;

    static long tax\_one\_way\_four\_wheeler;

    static long tax\_two\_way\_four\_wheeler;

    public:

    static void Two\_wheeler()

    {

        cout<<"Press 1 for one way or 2 for two way";

        cin>>way;

        if(way==1)

        {

            cout<<"Enter car number";

            cin>>car\_number[i];

            cout<<"Enter the date";

            cin>>date[i];

            count\_one\_way\_two\_wheeler+=1;

            tax\_one\_way\_two\_wheeler+=200;

            i++;

        }

        else

        {

            cout<<"Enter car number";

            cin>>car\_number[i];

            cout<<"Enter the date";

            cin>>date[i];

            count\_two\_way\_two\_wheeler+=1;

            tax\_two\_way\_two\_wheeler+=350;

            i++;

        }

    }

    static void Four\_wheeler()

    {

        cout<<"Press 1 for one way or 2 for two way";

        cin>>way;

        if(way==1)

        {

            cout<<"Enter car number";

            cin>>car\_number[i];

            cout<<"Enter the date";

            cin>>date[i];

            count\_one\_way\_four\_wheeler+=1;

            tax\_one\_way\_four\_wheeler+=350;

            i++;

        }

        else

        {

            cout<<"Enter car number";

            cin>>car\_number[i];

            cout<<"Enter the date";

            cin>>date[i];

            count\_two\_way\_four\_wheeler+=1;

            tax\_two\_way\_four\_wheeler+=500;

            i++;

        }

    }

    static void display()

    {

        cout<<"number of 2 wheeler for 1 way is: "<<count\_one\_way\_two\_wheeler<<"\n";

        cout<<"number of 2 wheeler for 2 way is: "<<count\_two\_way\_two\_wheeler<<"\n";

        cout<<"number of 4 wheeler for 1 way is: "<<count\_one\_way\_four\_wheeler<<"\n";

        cout<<"number of 4 wheeler for 2 way is: "<<count\_two\_way\_four\_wheeler<<"\n";

        cout<<"total tax of 2 wheeler for 1 way is: "<<tax\_one\_way\_two\_wheeler<<"\n";

        cout<<"total tax of 2 wheeler for 2 way is: "<<tax\_two\_way\_two\_wheeler<<"\n";

        cout<<"total tax of 4 wheeler for 1 way is: "<<tax\_one\_way\_four\_wheeler<<"\n";

        cout<<"total tax of 4 wheeler for 1 way is: "<<tax\_two\_way\_four\_wheeler<<"\n";

    }

};

    int vehicles:: way=0;

    int vehicles:: i=0;

    char vehicles:: car\_number[100][50]={0,0,0,0,0};

    char vehicles:: date[100][10]={0,0,0,0,0};

    int vehicles::count\_one\_way\_two\_wheeler=0;

    int vehicles:: count\_two\_way\_two\_wheeler=0;

    int vehicles:: count\_one\_way\_four\_wheeler=0;

    int vehicles:: count\_two\_way\_four\_wheeler=0;

    long vehicles:: tax\_one\_way\_two\_wheeler=0;

    long vehicles:: tax\_two\_way\_two\_wheeler=0;

    long vehicles:: tax\_one\_way\_four\_wheeler=0;

    long vehicles:: tax\_two\_way\_four\_wheeler=0;

int main()

{

    int choice1, choice2;

    do

    {

        cout<<"Press 2 for two wheeler\n";

        cout<<"Press 4 for four wheeler\n";

        cout<<"Press 1 for display of tax";

        cin>>choice1;

        switch(choice1)

        {

            case(2):

            vehicles::Two\_wheeler();

            break;

            case(4):

            vehicles::Four\_wheeler();

            break;

            case(1):

            vehicles::display();

            break;

        }

        cout<<"Press 1 for continuing or press 0 for exit";

        cin>>choice2;

    } while (choice2==1);

    return 0;

}

OUTPUT

A picture containing text

Description automatically generated