Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

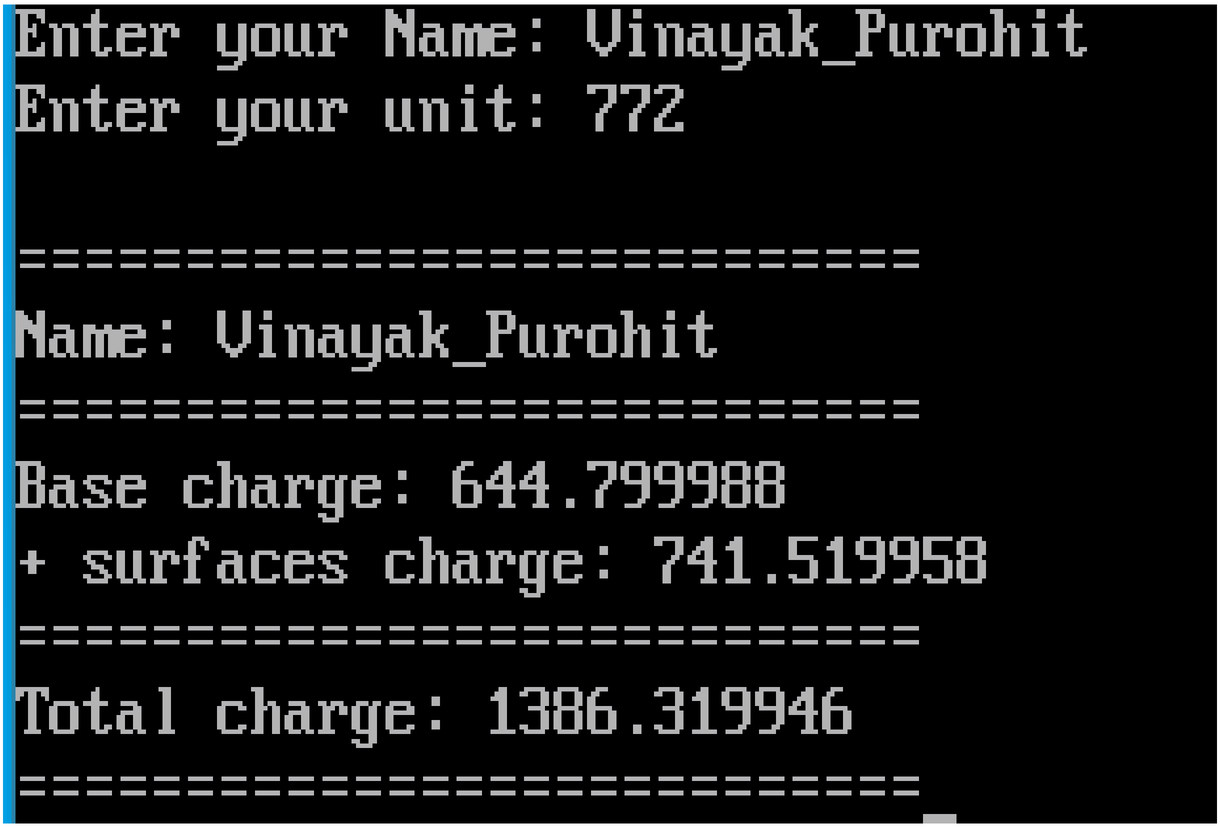
Q1. An electricity board charges the following rates to user. For the first 100 units → 60p per unit. For the next 200 units→80p per unit. Beyond 300 units→90p per unit. All users are charged a minimum of Rs. 50; if the total amount is more than 300 then an additional surcharges of 15% is added. Write a program to accept name of user consumed and print charges with their rates

<Source code>

```
#include<conio.h>

#include<#include<iostream.h>

string.h>

class calcharge

{

        protected:

                float charge,surfcharges;

                int unit;

                char name[20];

        public:

                calcharge(char nm[], int value)

                {

                        unit=value;

                        strcpy(name,nm);

                        charge=0;

                        surfcharges=0;

                }

                void basecharge()

                {

                        if(unit<=100)
        {
                charge = unit*0.60;
        }
        else if(unit>100 && unit<=300)
        {
                charge = (100*0.60)+(unit-100)*0.80;
        }
        else
        {
                charge = (100*0.60)+(200*0.80)+(unit-300)*0.90;
        }
}
void checkmin()
{
        if(charge<=50)
                charge = 50;
}
void surfcharge()
{
        if(charge>300)
                surfcharges = charge + charge*0.15;
}
void display()
{
        cout<<"\n===============================";
        cout<<"\nName: "<<name;
```

```
                        if(surfcharges>0)
                        {      cout<<"\n===========================";
                                cout<<"\nBase charge: "<<charge;
                                cout<<"\n+ surfaces charge: "<<surfcharges;
                        }
                        cout<<"\n===========================";
                        cout<<"\nTotal charge: "<<charge+surfcharges;
                        cout<<"\n===========================";
                }
};
void main()
{
        char nm[20];
        int unit;
        clrscr();
        cout<<"Enter your Name: ";
        cin>>nm;
        cout<<"Enter your unit: ";
        cin>>unit;
        calcharge bill(nm, unit);
        bill.basecharge();
        bill.checkmin();
        bill.surfcharge();
        bill.display();
        getch();
}
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772



```
Enter your Name: Vinayak_Purohit
Enter your unit: 772


===========================

Name: Vinayak_Purohit
===========================

Base charge: 644.799988
+ surfaces charge: 741.519958
===========================

Total charge: 1386.319946
===========================
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q2. Define a class to represent a bank account. Include the following members: a. Name of the depositor b. Account number c. Type of Account d. Balance amount in the Account Member Functions: a. To assign initial values. b. To deposit an amount. c. To withdraw an amount after checking the balance. d. To display name and balance. Write main program and handle accounts of 5 customer

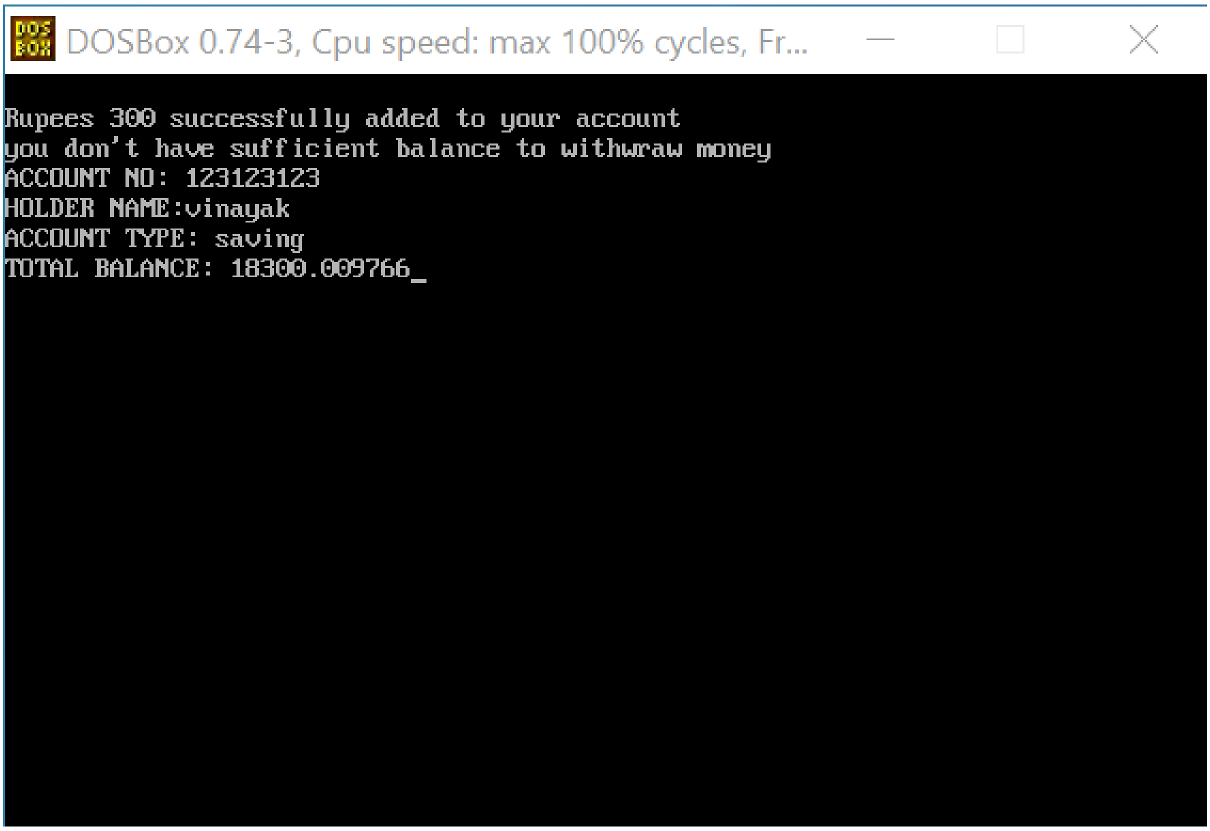
<source code>

```
#include<iostream.h>

#include<conio.h>

#include<string.h>

class Bank

{

        private:

                long accno;

                float balance;

                char holdernm[15],acctype[10];

        public:

                void Addinfo(long accnum, char custnm[], char accnm[], float amount)

                {

                        accno = accnum;

                        strcpy(holdernm,custnm);

                        strcpy(acctype,accnm);

                        balance = amount;

                }

                void Deposit(float amount)

                {

                        if(amount>0)
```

```
            {
                balance += amount;
                cout<<"\nRupees "<<amount<<" successfully added to your account";
            }
            else
                cout<<"\nPlease enter an valid Amount";
        }
        void Withdraw(float amount)
        {
            if(amount>0)
            {
                if(balance>amount)
                {
                    balance -= amount;
                    cout<<"\nRupees "<<amount<<" successfully deducted from your account";
                }
                else
                    cout<<"\nyou don't have sufficient balance to withwraw money";
            }
            else
                cout<<"\nPlease Enter valid amount";
        }
        void Display()
        {
            cout<<"\nACCOUNT NO: "<<accno;

            cout<<"\nHOLDER NAME:"<<holdernm;

            cout<<"\nACCOUNT TYPE: "<<acctype;

            cout<<"\nTOTAL BALANCE: "<<balance;

        }

};

void main()

{

    long accno;

    float balance;

    char holdernm[15],acctype[10];

    Bank b[5];

    clrscr();

    b[1].Addinfo(123123123,"vishal","saving",18000.01);

    b[2].Addinfo(99295,"Rakesh","current",35000.23);

    b[3].Addinfo(23541,"mahesh","saving",12030.6);

    b[4].Addinfo(98437,"shailesh","saving",9002.28);

    b[5].Addinfo(93625,"chirag","current",19002.35);

    // perfoming task

    b[1].Deposit(300);

    b[1].Withdraw(20000);

    b[1].Display();

    getch();

}
```

OUTPUT:

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772



```
Rupees 300 successfully added to your account
you don't have sufficient balance to withwraw money
ACCOUNT NO: 123123123
HOLDER NAME:vinayak
ACCOUNT TYPE: saving
TOTAL BALANCE: 18300.009766_
```

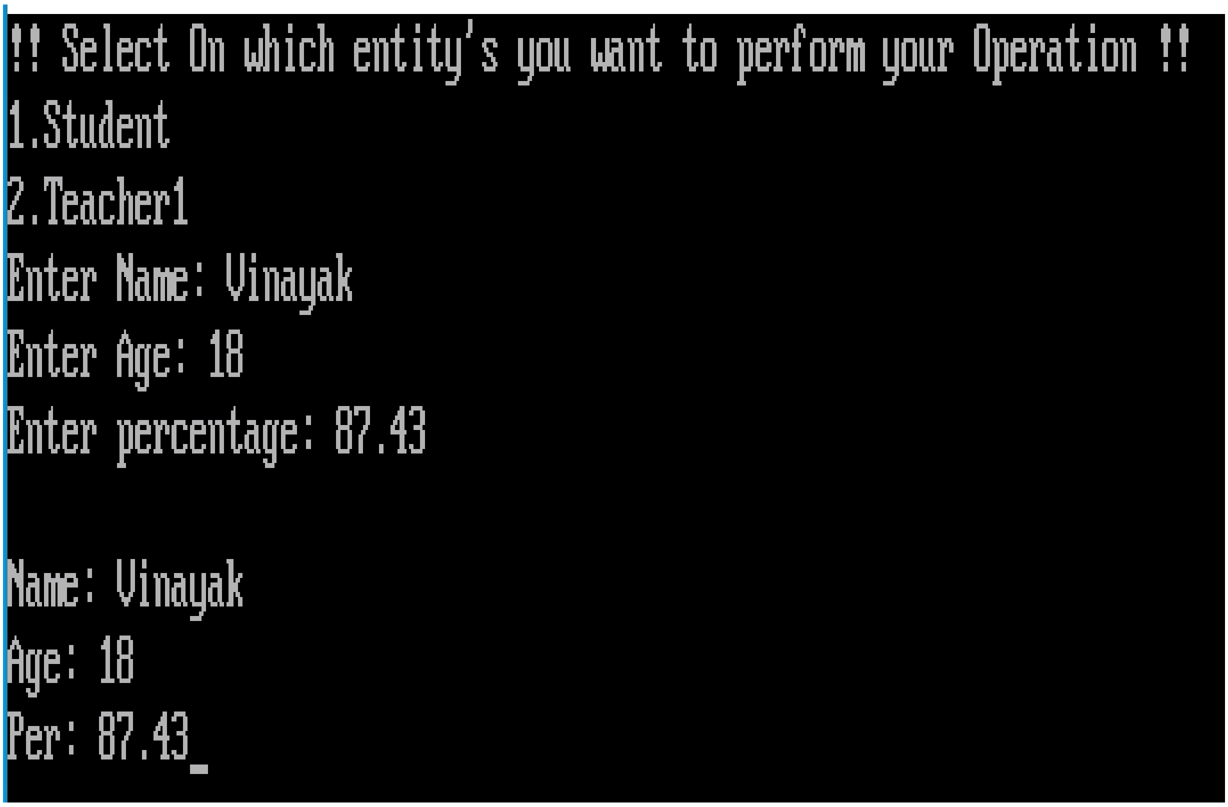
Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q3. Program to create a class person having members name and age. Derive a class student having member percentage. Derive another class teacher having member salary. Write necessary member function to initialize, read and write data. Also write the main function.

<source code>

```
#include<iostream.h>

#include<conio.h>

class Person

{

        protected:

                char name[15];

                int age;

        public:

                void getdetail()

                {

                        cout<<"Enter Name: ";

                        cin>>name;

                        cout<<"Enter Age: ";

                        cin>>age;

                }

};

class Student: public Person

{

        protected:

                float per;

        public:

                void getdata()
                {       Person::getdetail();

                        cout<<"Enter percentage: ";

                        cin>>per;

                }

                void display()

                {

                        cout<<"\nName: "<<name;

                        cout<<"\nAge: "<<age;

                        cout<<"\nPer: "<<per;

                }

};

class Teacher: public Person

{

        protected:

                float salary;

        public:

                void getdata()

                {

                        Person::getdetail();

                        cout<<"\nEnter salary: ";

                        cin>>salary;

                }

                void display()

                {

                        cout<<"\nName: "<<name;

                        cout<<"\nAge: "<<age;
                        cout<<"\nSalary: "<<salary;
                }
};
void main()
{
        int ch;
        Student s;
        Teacher t;
        clrscr();
        cout<<"!! Select On which entity's you want to perform your Operation !!";
        cout<<"\n1.Student";
        cout<<"\n2.Teacher";
        cin>>ch;
        if(ch == 1)
        {
                s.getdata();
                s.display();
        }else if(ch == 2){
                t.getdata();
                t.display();
        }else
                cout<<"!! Please select valid choice !!";
        getch();
}
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

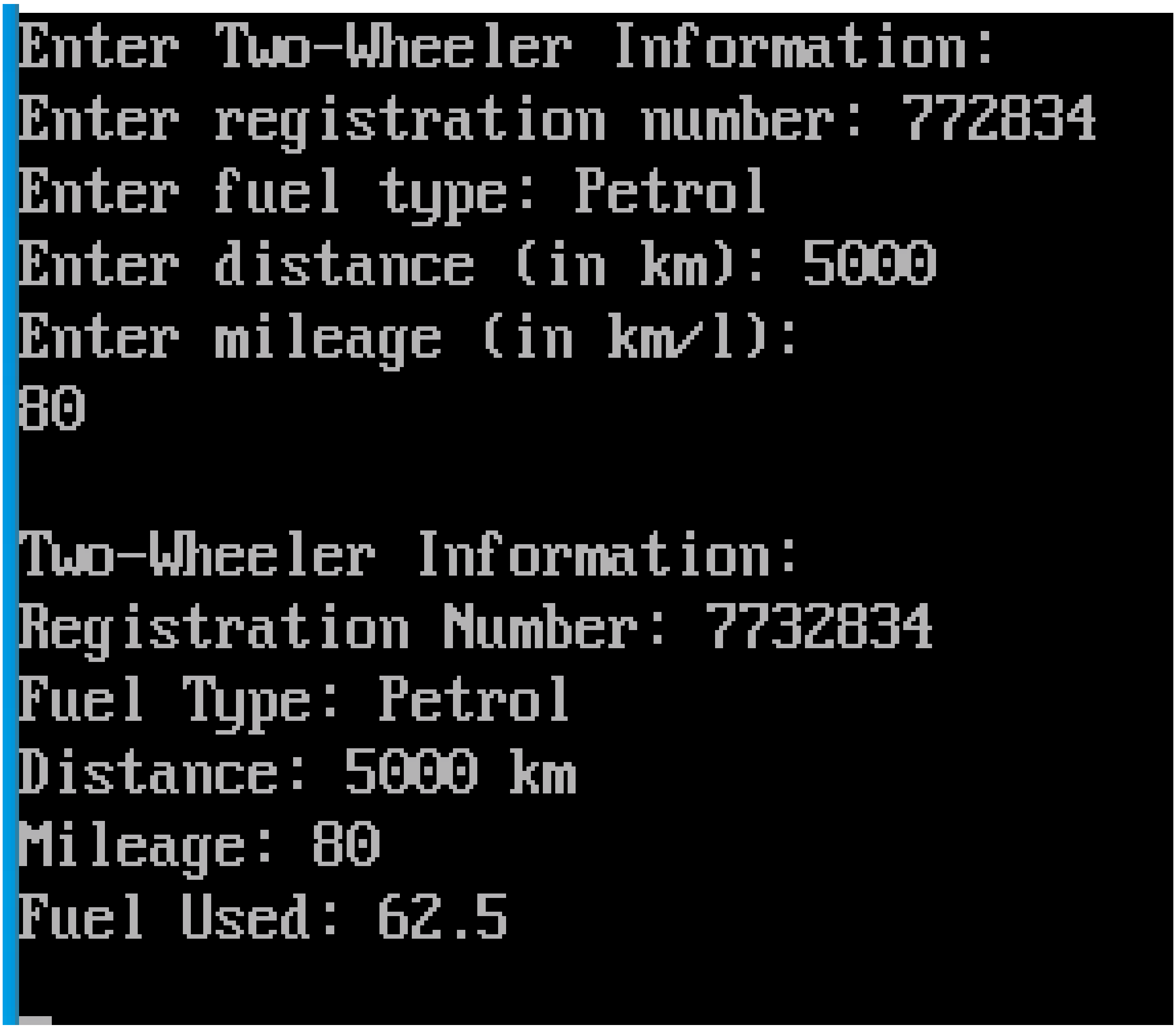


```
!! Select On which entity's you want to perform your Operation !!
1.Student
2.Teacher1
Enter Name: Vinayak
Enter Age: 18
Enter percentage: 87.43

Name: Vinayak
Age: 18
Per: 87.43_
```

Q4. Program to create a class name student having date member name, no & three marks. Write a member function to input name, roll no & marks & calculate percentage

<source code>

```
#include<iostream.h>

#include<conio.h>

class Student

{

        protected:

                int roll_no,marks[3];

                char name[15];

                float per;

        public:

                void getdata()

                {

                        cout<<"Enter Rollno: ";

                        cin>>roll_no;

                        cout<<"Enter Name: ";

                        cin>>name;

                        for(int i=0;i<3;i++)

                        {

                                cout<<"Enter marks of sub "<<i+1<<" :";

                                cin>>marks[i];

                        }

                }

                void calculateper()
                {
                        int totalmarks=0;
                        for(int i=0;i<3;i++)
                                totalmarks += marks[i];
                        per = totalmarks/3;
                }
                void display()
                {
                        cout<<"\nRoll No: "<<roll_no;
                        cout<<"\nName: "<<name;
                        for(int i=0;i<3;i++)
                                cout<<"\nMarks of sub "<<i+1<<" :"<<marks[i];
                        cout<<"\nPer: "<<per;
                }
};
void main()
{     Student s;
        clrscr();
        s.getdata();
        s.calculateper();
        s.display();
        getch();
}
```



```
Enter Two-Wheeler Information:
Enter registration number: 772834
Enter fuel type: Petrol
Enter distance (in km): 5000
Enter mileage (in km/l):
80

Two-Wheeler Information:
Registration Number: 7732834
Fuel Type: Petrol
Distance: 5000 km
Mileage: 80
Fuel Used: 62.5
```

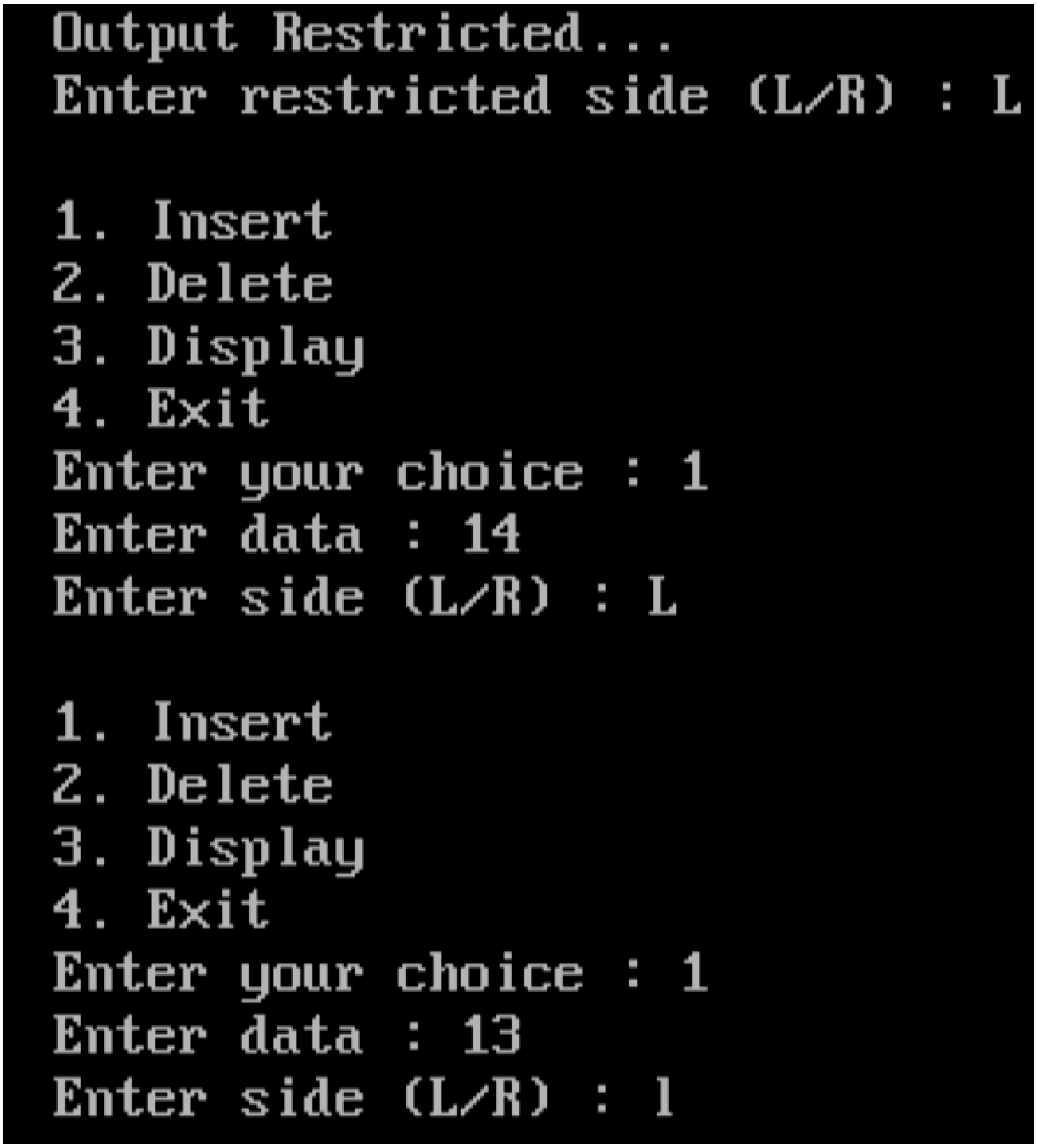
5. Create a class called "Vehicle" which contains data members registration number and fuel type Make getdata() function to input data value. Create class "two-Wheeler" from vehicle which contains data member’s distance and mileage Make getdata() function to input data. Use overloading techniques for getdata() function and display the information with fuel used.

<source code>

```
#include <iostream.h>

#include <conio.h>

class vehicle

{

        protected:

                int reg_no;

                char fueltype[8];

        public:

                void getdata() {

                        cout << "Enter registration number: ";

                        cin >> reg_no;

                        cout << "Enter fuel type: ";

                        cin >> fueltype;

                }

                void display() {

                        cout << "Registration Number: " << reg_no << endl;

                        cout << "Fuel Type: " << fueltype << endl;

                }

};

class twowheeler : public vehicle

{
    private:
        double distance;
        double mileage;
    public:
        void getdata() {
            vehicle::getdata();
            cout << "Enter distance (in km): ";
            cin >> distance;
            cout << "Enter mileage (in km/l): ";
            cin >> mileage;
        }
        void display() {
            vehicle :: display();
            cout << "Distance: " << distance << " km" << endl;
            cout << "Mileage: " << mileage << endl;
            double fuelused = distance / mileage;
            cout << "Fuel Used: " << fuelused <<endl;
        }
};
void main() {
    clrscr();
    twowheeler tw;
    cout << "Enter Two-Wheeler Information:" << endl;
    tw.getdata();
    cout << "\nTwo-Wheeler Information:" << endl;
    tw.display();
```

```
        getch();
}
```

OUTPUT:



```
Output Restricted...
Enter restricted side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 1
Enter data : 14
Enter side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 1
Enter data : 13
Enter side (L/R) : l
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q6. Write a program that consist of two classes Time12 and Time24. The first one maintains time on 12 hour basis, whereas the other one maintains it on 24-hour basis

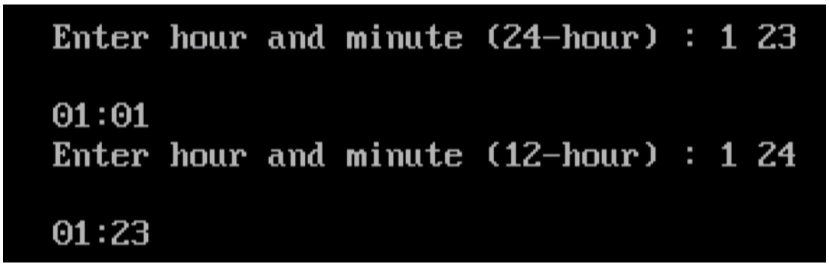
<source code>

```
#include <iostream.h>

#include <conio.h>

class Time12;

class Time24

{

   int h, m;

   public:

          void getData()

          {

             cout << "\nEnter hour and minute (24-hour) : ";

             cin >> h >> m;

          }

          int geth()

          {

             return h;

          }

          int getm()

          {

             return m;

          }

          void putData()

          {
```

```
        cout << "\n";
        if (h <= 9)
            cout << "0" << h << ":";
        else
            cout << h << ":";
        if (m <= 9)
            cout << "0" << m;
        else
            cout << m;
    }
};
class Time12
{
    int h, m;
    public:
    Time12(Time24 t)
    {
        h = t.geth();
        if (h > 12)
        {
            h = h % 12;
            m = t.getm();
        }
    }
    void getData()
    {
        cout << "\nEnter hour and minute (12-hour) : ";
        cin >> h >> m;
    }
    void putData()
    {
        cout << "\n";
        if (h <= 9)
            cout << "0" << h << ":";
        else
            cout << h << ":";
        if (m <= 9)
            cout << "0" << m;
        else
            cout << m;
    }
};
void main()
{
    clrscr();
    Time12 t12;
    Time24 t24;

    t24.getData();
    t12 = t24;

    t12.putData();
    t12.getData();
    t24.putData();
```

```
        getch();
}
```

OUTPUT:



```
Enter hour and minute (24-hour) : 1 23

01:01
Enter hour and minute (12-hour) : 1 24

01:23
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q7).Create two classes DM and DB which store the values of distance. DM stores distance in meters and centimeters. DB stores distances in feet and inches. Write a program that can read values for the class object and add one object of DM with another object of DB. Use a friend function to carry out the addition operation and this function will display answer in meter and centimeters

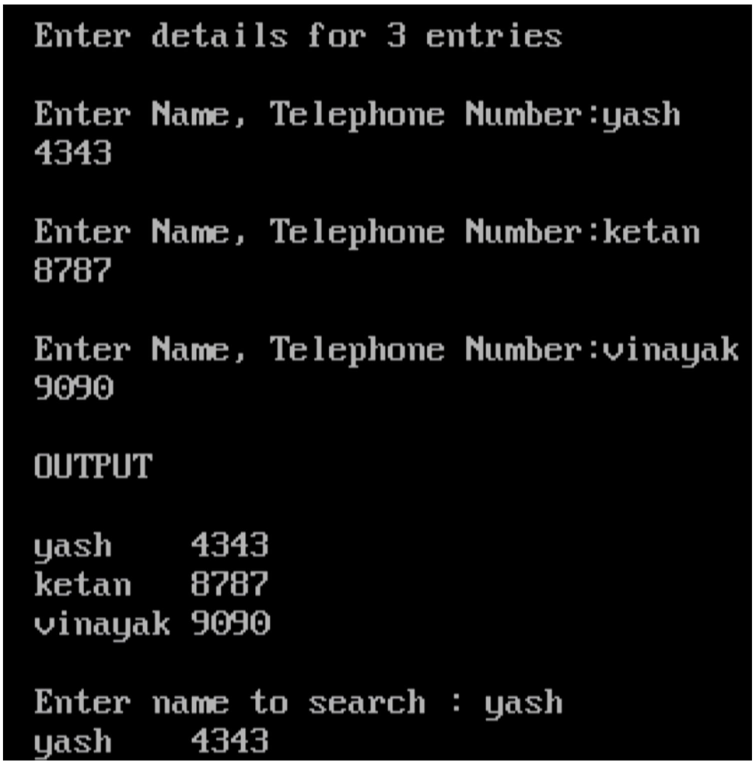
<source code>

```
#include <iostream.h>
#include <conio.h>
#include <string.h>
class tel_dir {
  char name[20];
  int number;
public:
  void ADD() {
    cout << "\nEnter Name, Telephone Number:";
    cin >> name >> number;
  }

  void show() {
    cout << name << "\t" << number << endl;
  }

  int isExists(char *nm)
  {
    return strcmp(nm, name) == 0;
  }
```

```
};
int main()
{
   int i;
   tel_dir entry[3];
   clrscr();
    cout << "\nEnter details for 3 entries\n";
   for (i = 0; i < 3; i++) {
      entry[i].ADD();
   }

   cout << "\nOUTPUT\n\n";

   for (i = 0; i < 3; i++) {
      entry[i].show();
   }

   char nm[20];
   cout << "\nEnter name to search : ";
   cin >> nm;
   for (i = 0; i < 3; i++) {
      if (entry[i].isExists(nm))
         entry[i].show();
   }
   getch();
   return 0;
```

}

OUTPUT:



```
Enter details for 3 entries

Enter Name, Telephone Number:yash
4343

Enter Name, Telephone Number:ketan
8787

Enter Name, Telephone Number:vinayak
9090

OUTPUT

yash    4343
ketan   8787
vinayak 9090

Enter name to search : yash
yash    4343
```

Q8).Write a program to maintain a telephone directory use add() and Show() methods to add new entries and display the telephone numbers of a person when the name of the person is given

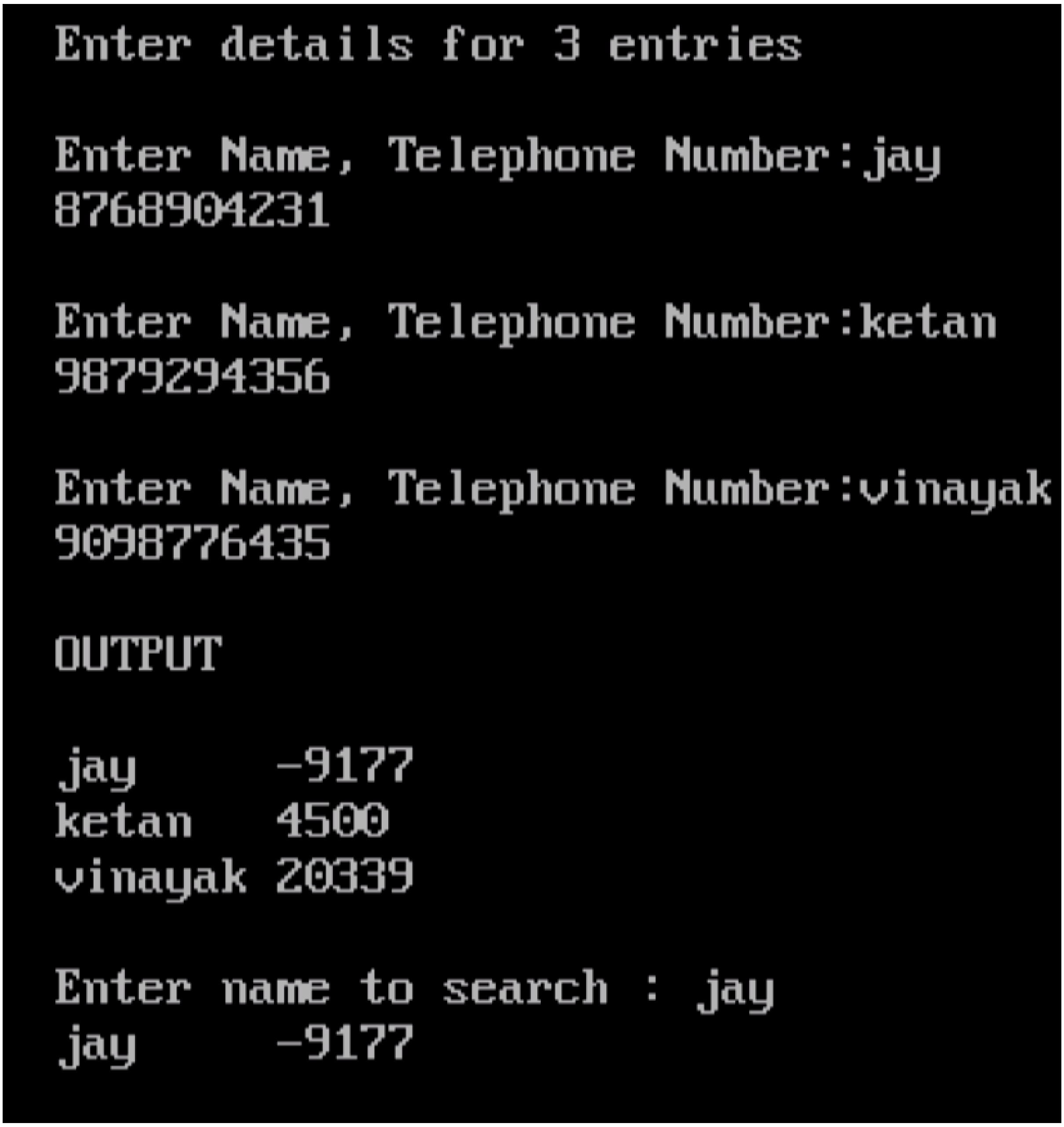
<source code>

```
#include <iostream.h>

#include<conio.h>

#include <string.h>


class tel_dir

{
    int totalrecord;

    int sno;

    struct Record

    {

            char name[20];

            long number;

    } records[50];


public:

    tel_dir()

    {

            totalrecord = 50;

            sno=0;

    }


    void add()

    {

            if (sno < totalrecord)

            {

                cout << "\nEnter Name: ";

                cin >> records[sno].name;


                cout << "\nEnter Telephone Number: ";

                cin >> records[sno].number;


                sno++;
```

```
          }
          else
          {
             cout << "Phone directory is full." << endl;
          }
   }
    void show(char sname[])
   {
          for (int i = 0; i<=sno-1; i++)
          {
             if (strcmp(records[i].name,sname) == 0)
             {
                    cout<<"Name: "<<records[i].name<<"\nNumber: "<<records[i].number <<
endl;
             }
          }
   }
};
void main()
{
   tel_dir entry;
   char nm[20];
   int ch;
   clrscr();
   do
   {
   cout<<"1. Add records"<<endl;
```

```
    cout<<"2. Show"<<endl;
    cout<<"3. Exit"<<endl;
    cout<<"Enter your choice: ";
    cin>>ch;
        switch (ch) {
            case 1:
                entry.add();
                break;
            case 2:
                cout << "Enter name to search: ";
                cin>>nm;
                entry.show(nm);
                break;
            case 3:
                break;
            default:
                cout<<"ERROR 72: !! Something went wrong...!!\n";
                break;
            }
    }while(ch!=3);
    getch();
}
```

OUTPUT:



```
Enter details for 3 entries

Enter Name, Telephone Number:jay
8768904231

Enter Name, Telephone Number:ketan
9879294356

Enter Name, Telephone Number:vinayak
9098776435

OUTPUT

jay     -9177
ketan   4500
vinayak 20339

Enter name to search : jay
jay     -9177
```

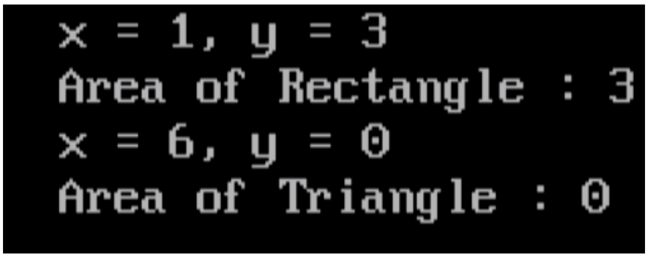
Q9).Create a base class shape use the class two store double type value that could be used to compare the area. A drive to specific classes called triangle and rectangle. From the base shape and a member in get data to the base class to initialize base data member and another function display area. 10.

<source code>

```
#include<iostream.h>

#include<conio.h>

class shape

{

protected:

        double x,y;

public:

        void get(int a,int b)

        {

                x=a;

                y=b;

        }


        virtual void display_area()=0;

};

class rec:public shape

{

public:

        void display_area()

        {

                cout<<"\nx = "<< x <<", y = "<< y <<" ";

                cout<<"\nArea of Rectangle : ";
        cout<<x*y;
    }
};

class tri:public shape
{
public:
    void display_area()
    {
        cout<<"\nx = "<< x <<", y = "<< y <<" ";
        cout<<"\nArea of Triangle : ";
        cout<<0.5*x*y;
    }
};
void main(){
    shape *ptr;
    rec r1;
    tri t1;
    clrscr();
    r1.get(1,3);
    t1.get(6,0);
    ptr=&r1;
    ptr->display_area();
    ptr=&t1;
    ptr->display_area();
    getch();
```

```
}
```

OUTPUT:



```
x = 1, y = 3
Area of Rectangle : 3
x = 6, y = 0
Area of Triangle : 0
```

Q10).Write Program to implement Stack Operations like PUSH, POP, PEEP, UPDATE and DISPLAY using class and object

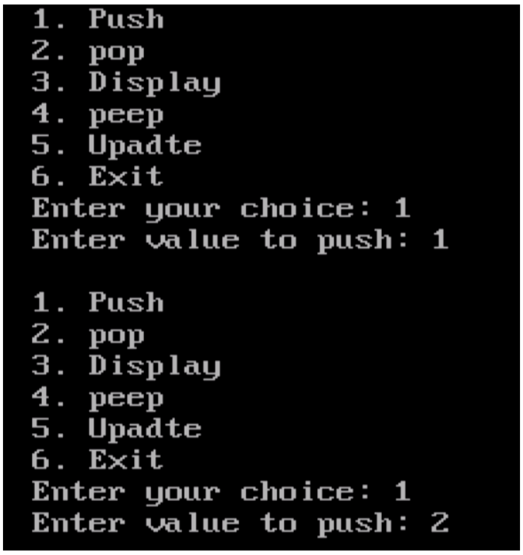
<source code>

```
#include<iostream.h>

#include<conio.h>

class Stack

{

        protected:

                int s[5];

                int top,data,n;

        public:

                Stack() {

                        top = -1;

                        n=5;
```

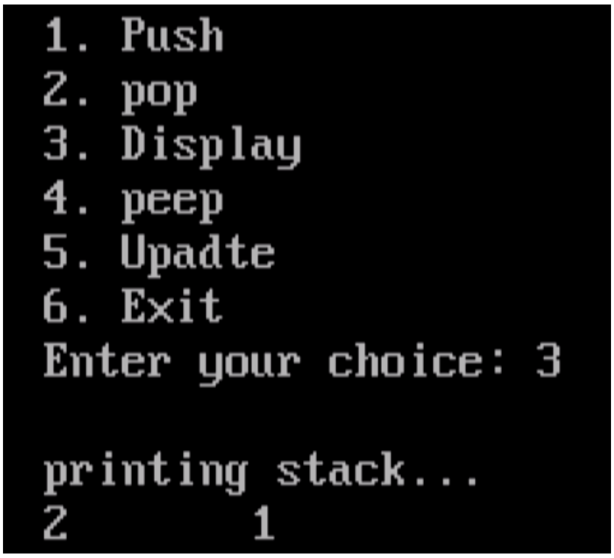
```
}
void push(int val) {
        if(top == n-1)
                cout<<"Stack overflow.....";
        else {
                top++;
                s[top]=val;
        }
}
int pop() {
        if(top==-1) {
                cout<<"stack underflow....";
                return 0;
        }
        else {
                data = s[top];
                top--;
                return data;
        }
}

void display()
{     int i;
        cout<<"\nprinting stack..."<<endl;
        for(i=top;i>-1;i--)
                cout<<s[i]<<"\t";
        }

        void peep(int position) {
            int i;
            i=position;
            if(top-i+1<0)
                cout<<"Stack underflow...";
            else
                cout<<"Data is: "<<s[top-i+1];
        }
        void edit(int position) {
            int i;
            i=position;
            if(top-i+1<0)
                cout<<"stack underflow..";
            else {
                cout<<"value at this location is: "<<s[top-i+1];
                cout<<"\nEnter value to change: ";
                cin>>s[top-i+1];
            }
        }
};
void main()
{
    int ch,data;
    Stack s;
```

```
clrscr();
do
{
        cout<<"\n1. Push\n2. pop\n3. Display\n4. peep\n5. Upadte\n6. Exit";
        cout<<"\nEnter your choice: ";
        cin>>ch;

        switch (ch)
        {
                case 1:
                        cout<<"Enter value to push: ";
                        cin>>data;
                        s.push(data);
                        break;
                case 2:
                        cout<<s.pop()<<" is deleted...";
                        break;
                case 3:
                        s.display();
                        break;
                case 4:
                        cout<<"Enter from top to display: ";
                        cin>>data;
                        s.peep(data);
                        break;
                case 5:
                    cout<<"Enter from top to update: ";
                    cin>>data;
                    s.edit(data);
                    break;
                case 6:
                    break;
            }
        }while(ch!=6);
        getch();
}
```

OUTPUT:



```
 1. Push
 2. pop
 3. Display
 4. peep
 5. Upadte
 6. Exit
 Enter your choice: 1
 Enter value to push: 1

 1. Push
 2. pop
 3. Display
 4. peep
 5. Upadte
 6. Exit
 Enter your choice: 1
 Enter value to push: 2
```



```
1. Push
2. pop
3. Display
4. peep
5. Upadte
6. Exit
Enter your choice: 3

printing stack...
2          1
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q11). Write Program to convert Infix to Postfix Expression using class and object.

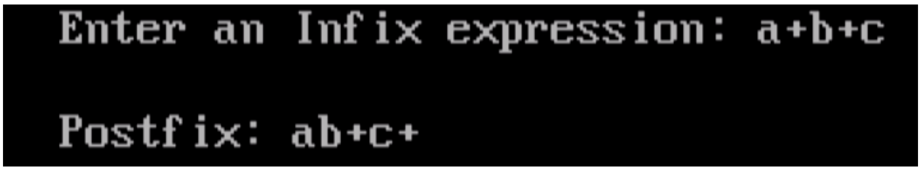
<source code>

```
#include<iostream.h>
#include<conio.h>
int top = -1;
int s[50];
class Stack
{
        char data;
        public:
        void push(char val)
        {
                data = val;
                top++;
                s[top] = data;
        }
        char pop()
        {
                data = s[top];
                top--;
                return data;
        }
        int priority(char op)
        {
                int c=0;
                switch (op)
                {
                        case '^':
                                c=3;
                                break;

                        case '*':case '/':
                                c=2;
                                break;

                        case '+':case '_':
                                c=1;
                                break;
                }
                return c;
        }
};
void main()
{
        Stack si;
        char in[50],post[50];
        int j=0;
        clrscr();
        cout<<"Enter an Infix expression: ";
        cin>>in;
```

```
for(int i=0;in[i]!='\0';i++)
{
        switch(in[i])
        {
                case '(':
                        si.push(in[i]);
                        break;

                case '+': case '-': case '*': case '/':
                        while(si.priority(s[top])>=si.priority(in[i]))
                                post[j++]=si.pop();
                        si.push(in[i]);
                        break;
                case ')':
                        while(s[top]!='(')
                                post[j++] = si.pop();
                        si.pop();
                        break;
                default:
                        post[j++] = in[i];
                        break;
        }
}
while(top>=0)
        post[j++] = si.pop();
post[j] = '\0';
```

```
        cout<<"\nPostfix: "<<post;
        getch();
}
```

OUTPUT:



```
Enter an Infix expression: a+b+c

Postfix: ab+c+
```

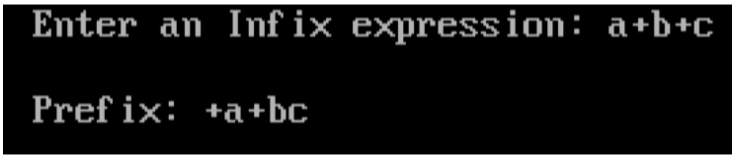
Q12). Write Program to convert Infix to Prefix Expression using class and object.

<source code>

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
int top = -1;
int s[50];
class Stack
{
        char data;
        public:
        void push(char val)
        {
                data = val;
        top++;

        s[top] = data;

}

char pop()

{

        data = s[top];

        top--;

        return data;

}

int priority(char op)

{

        int c=0;

        switch (op)

        {

                case '^':

                        c=3;

                        break;


                case '*':case '/':

                        c=2;

                        break;


                case '+':case '_':

                        c=1;

                        break;

        }
```

```
                return c;
        }
};
void main()
{
        Stack si;
        char in[50],pre[50];
        int j=0;
        clrscr();
        cout<<"Enter an Infix expression: ";
        cin>>in;

        strrev(in);

        for(int i=0;in[i]!='\0';i++)
        {
                switch(in[i])
                {
                        case ')':
                                si.push(in[i]);
                                break;

                        case '+': case '-': case '*': case '/':
                                while(si.priority(s[top])>=si.priority(in[i]))
                                        pre[j++]=si.pop();
                                si.push(in[i]);
                break;
            case '(':
                while(s[top]!=')')
                    pre[j++] = si.pop();
                si.pop();
                break;
            default:
                pre[j++] = in[i];
                break; }
    }
    while(top>=0)
        pre[j++] = si.pop();
    pre[j] = '\0';
    strrev(pre);
    cout<<"\nPrefix: "<<pre;
    getch();
}
```

OUTPUT:



```
Enter an Infix expression: a+b+c

Prefix: +a+bc
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

Q13). Write Program to implement Simple Queue Operations like Insert, Delete and Display.

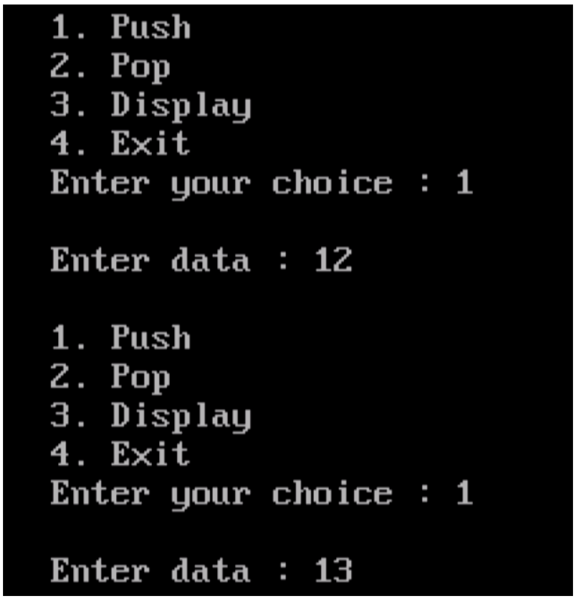
<source code>

```
#include<iostream.h>

#include<conio.h>

const int n = 5;

class Queue {

private:

   int q[n];

   int f, r;

public:

   Queue() {

      f = r = -1;

   }  void push(int data) {

      if (r == n - 1) {

         cout << "Overflow" << endl;

         return;

      }

      r++;

      q[r] = data;

      if (f == -1)

         f++;

   }

 int pop() {

      int data;

      if (f == -1) {
            cout << "Underflow" << endl;

            return 0;

        }

        data = q[f];

        if (f == r)

            f = r = -1;

        else

            f++;

        return data;

    }


    void display() {

        int i;

        if (f == -1) {

            cout << "Underflow" << endl;

            return;

        }

        for (i = f; i <= r; i++) {

            cout << q[i] << "\t";

        }

        cout << endl;

    }

};


int main() {

    Queue que;
```

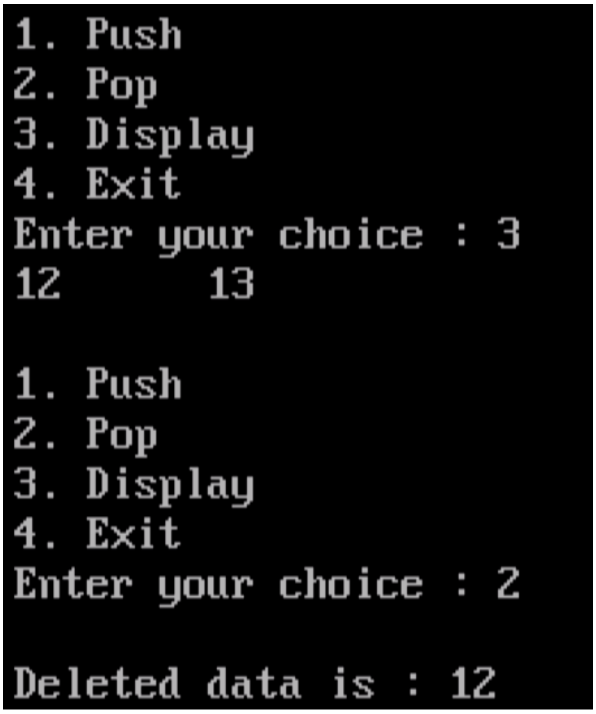
```
int ch, data;
clrscr();
do {
    cout << endl << "1. Push" << endl;
    cout << "2. Pop" << endl;
    cout << "3. Display" << endl;
    cout << "4. Exit" << endl;
    cout << "Enter your choice : ";
    cin >> ch;

    switch (ch) {
        case 1:
            cout << endl << "Enter data : ";
            cin >> data;
            que.push(data);
            break;
        case 2:
            data = que.pop();
            cout << endl << "Deleted data is : " << data;
            break;
        case 3:
            que.display();
            break;
    }
} while (ch != 4);
```

```
   getch();

   return 0;

}
```

OUTPUT:



```
1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 1

Enter data : 12

1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 1

Enter data : 13
```



```
1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 3
12      13

1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 2

Deleted data is : 12
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

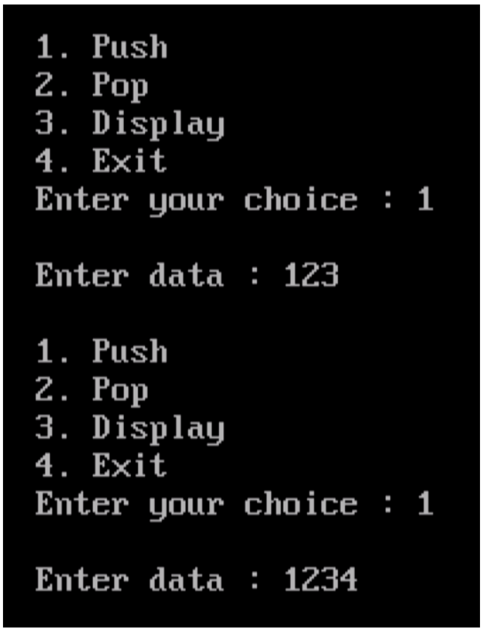
Q14).Write Program to implement Circular Queue Operations like Insert, Delete and Display using class and object

<source code>

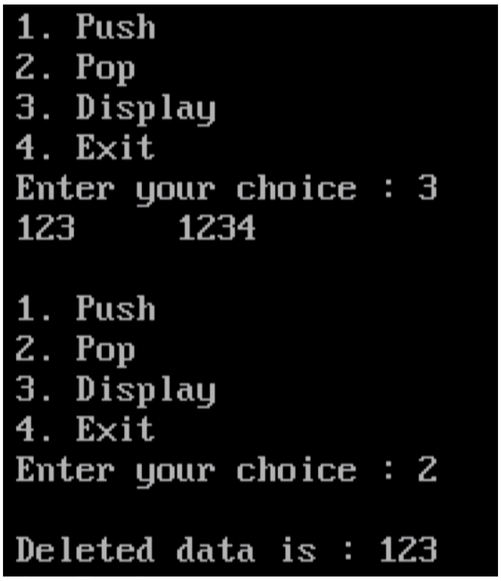
```
#include<iostream.h>
#include<conio.h>
const int n = 5;
class CircularQueue
{
        protected:
                int q[n];
                int f, r;

        public:
                CircularQueue()
                {
                        f = r = -1;
                }

                void push(int data)
                {
                        if ((r + 1) % n == f)
                        {
                                cout << "Overflow..." << endl;
                                return;
                        }
                        if (r == n - 1)
                        r = 0;
                else
                        r++;
                q[r] = data;

                if (f == -1)
                        f++;
        }

        int pop()
        {
                int data;
                if (f == -1)
                {
                        cout << "Underflow..." << endl;
                        return 0;
                }
                data = q[f];

                if (f == r)
                        f = r = -1;
                else if (f == n - 1)
                        f = 0;
                else
                        f++;
                return data;
```

```
}

void display()
{
        int i;
        if (f == -1)
        {
                cout << "Underflow..." << endl;
                return;
        }
        if (f <= r)
        {
                for (i = f; i <= r; i++)
                {
                        cout << q[i] << "\t";
                }
        }
        else
        {
                for (i = f; i < n; i++)
                        cout << q[i] << "\t";
                for (i = 0; i <= r; i++)
                        cout << q[i] << "\t";
        }
        cout << endl;
}
```

```
};

void main() {
   CircularQueue cq;
   int ch, data;
   clrscr();

   do {
         cout << endl << "1. Push" << endl;
         cout << "2. Pop" <<endl;
         cout << "3. Display" <<endl;
         cout << "4. Exit" <<endl;
         cout << "Enter your choice : ";
         cin >> ch;
         switch (ch)
         {
            case 1:
                  cout<<endl<<"Enter data : ";
                  cin>>data;
                  cq.push(data);
                  break;
            case 2:
                  data=cq.pop();
                  cout<<endl<< "Deleted data is : " << data;
                  break;
            case 3:
                    cq.display();
                    break;}
  } while (ch != 4);


  getch();
}
```



```
 1. Push
 2. Pop
 3. Display
 4. Exit
 Enter your choice : 1

 Enter data : 123

 1. Push
 2. Pop
 3. Display
 4. Exit
 Enter your choice : 1

 Enter data : 1234
```



```
1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 3
123     1234

1. Push
2. Pop
3. Display
4. Exit
Enter your choice : 2

Deleted data is : 123
```

Name:- Purohit Vinayak
Class :- SYBCA(sem-3)
Roll no :- G-772

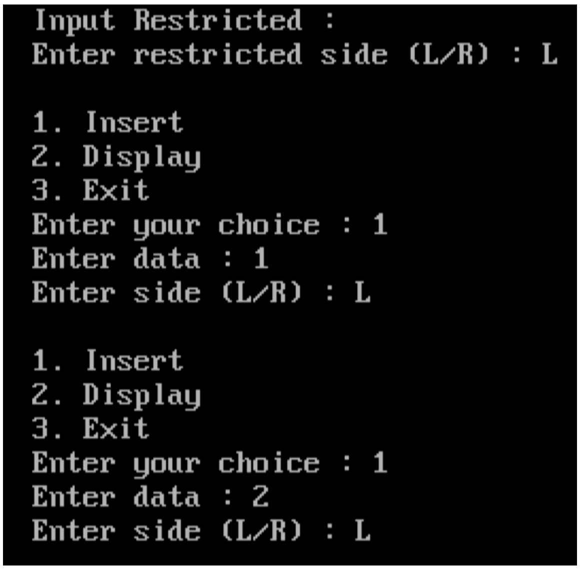
Q15).Write Program to implement Double Ended Queue Operations like Insert, Delete and Display using class and object(To Perform Input Restricted)

<source code>

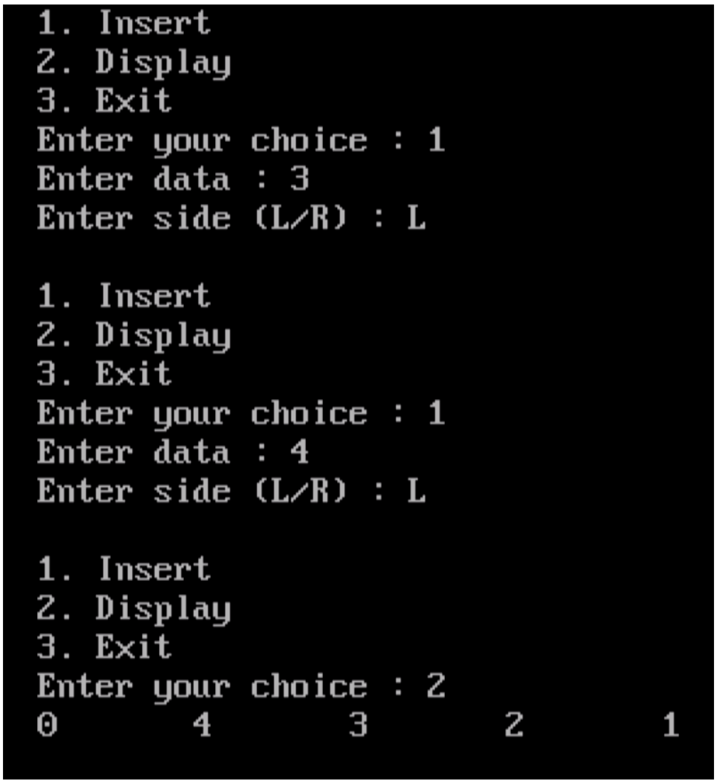
```
#include <iostream.h>

#include<conio.h>

class Cir_queue

{

        protected:

                int r, f;

                int dq[5];

                int n;

        public:

                Cir_queue(int size)

                {

                        n = size;

                        r = -1;

                        f = -1;

                }


                void insert_r(int data)

                {

                        if (r == n - 1)

                        {

                                cout << "Overflow..." << endl;

                                return;

                        }
        r++;

        dq[r] = data;


        if (f == -1)

        {

                f = 0;

        }

}


void insert_l(int data)

{

        if (f == 0)

        {

                cout << "Overflow..." << endl;

                return;

        }

        if (f == -1)

                f = r = n - 1;

        else

                f--;

        dq[f] = data;

}


void display()

{

        int i;
```

```
                    if (f == -1)
                    {
                            cout << "Underflow..." << endl;
                            return;
                    }
                    for (i = 0; i < n; i++)
                    {
                            cout << dq[i] << "\t";
                    }
                    cout << endl;
            }
};

void main()
{
  int ch, data;
  char io, ioside, side;
  Cir_queue rdq(5);

  cout << "Input Restricted : " << endl;
  cout << "Enter restricted side (L/R) : ";
  cin >> ioside;
  do
  {
        cout << "\n1. Insert " << endl;
        cout << "2. Display " << endl;
cout << "3. Exit " << endl;
cout << "Enter your choice : ";
cin >> ch;
switch (ch) {
  case 1:
         cout << "Enter data : ";
         cin >> data;
         if (io == 'i') {
           if (ioside == 'l') {
                  rdq.insert_r(data);
           }
           else
                  rdq.insert_l(data);
         }
         else {
           cout << "Enter side (L/R) : ";
           cin >> side;
           if (side == 'r')
                  rdq.insert_r(data);
           else
                  rdq.insert_l(data);
         }
         break;
  case 2:
         rdq.display();
         break;
```

```
        }
  } while (ch != 3);


  return 0;
}
```



```
Input Restricted :
Enter restricted side (L/R) : L

1. Insert
2. Display
3. Exit
Enter your choice : 1
Enter data : 1
Enter side (L/R) : L

1. Insert
2. Display
3. Exit
Enter your choice : 1
Enter data : 2
Enter side (L/R) : L
```



```
1. Insert
2. Display
3. Exit
Enter your choice : 1
Enter data : 3
Enter side (L/R) : L

1. Insert
2. Display
3. Exit
Enter your choice : 1
Enter data : 4
Enter side (L/R) : L

1. Insert
2. Display
3. Exit
Enter your choice : 2
0       4       3       2       1
```

Q16).Write Program to implement Double Ended Queue Operations like Insert, Delete and Display using class and object(To Perform Output Restricted)

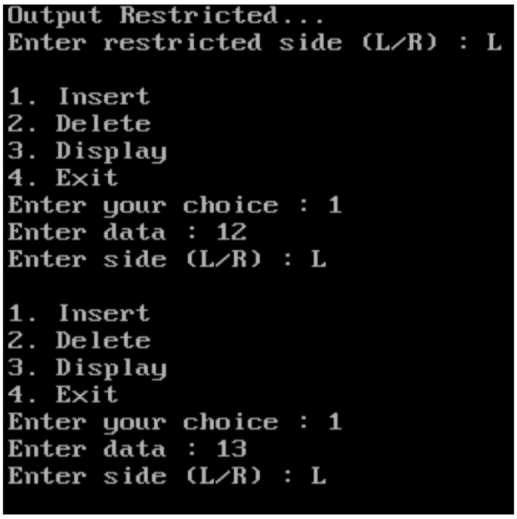
<source code>

```
#include <iostream.h>
#include<conio.h>
class CircularQueue {
private:
   int r, f;
   int dq[5];
   int n;
public:
   CircularQueue(int size) {
      n = size;
      r = -1;
      f = -1;
   }
   void insert_r(int data) {
      if (r == n - 1) {
         cout << "Overflow..." << endl;
         return;
      }
      r++;
      dq[r] = data;
      if (f == -1) {
         f = 0;
      }
```

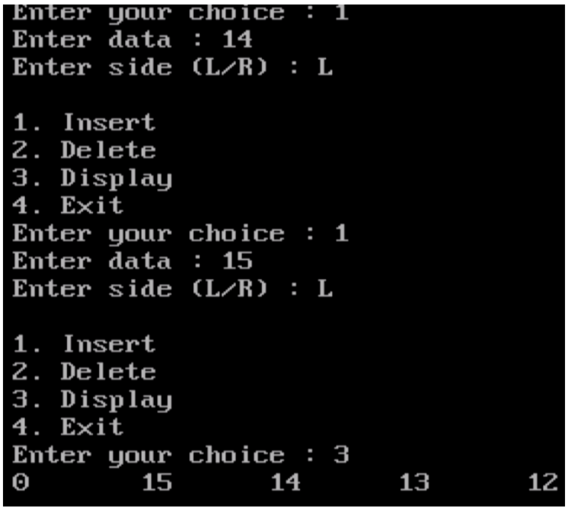
```
}

int delete_l() {
    int data;
    if (f == -1) {
        cout << "Underflow..." << endl;
        return 0;
    }
    data = dq[f];
    dq[f] = 0;
    if (f == r) {
        f = r = -1;
    } else {
        f++;
    }
    return data;
}
int delete_r() {
    int data;
    if (r == -1) {
        cout << "Underflow..." << endl;
        return 0;
    }
    data = dq[r];
    dq[r] = 0;
    if (f == r)
```

```
        f =  r = -1;
    else
         r--;
    return data;
}
 void insert_l(int data) {
    if (f == 0) {
        cout << "Overflow..." << endl;
        return;
    }
    if (f == -1)
        f = r = n - 1;
    else
        f--;
    dq[f] = data;
 }
  void display() {
    int i;
    if (f == -1) {
        cout << "Underflow...." << endl;
        return;
    }
    for (i = 0; i < n; i++) {
        cout << dq[i] << "\t";
    }
    cout << endl;
    }
};

void main() {
    int ch, data;
    char io, ioside, side;
    CircularQueue cq(5);
    cout << "Output Restricted..." << endl;
    cout << "Enter restricted side (L/R) : ";
    cin >> ioside;
    do {
        cout << endl << "1. Insert" << endl;
        cout << "2. Delete" << endl;
        cout << "3. Display" << endl;
        cout << "4. Exit" << endl;
        cout << "Enter your choice : ";
        cin >> ch;
        switch (ch) {
            case 1:
                cout << "Enter data : ";
                cin >> data;
                if (io == 'i') {
                    if (ioside == 'l') {
                        cq.insert_r(data);
                    } else {
                        cq.insert_l(data);
                }
            } else {
                cout << "Enter side (L/R) : ";
                cin >> side;
                if (side == 'r') {
                    cq.insert_r(data);
                } else {
                    cq.insert_l(data);
                }
            }
            break;
        case 2:
            if (io == '0') {
                if (ioside == 'l') {
                    data = cq.delete_r();
                } else {
                    data = cq.delete_l();
                }
            } else {
                cout << "Enter side (L/R) : ";
                cin >> side;
                if (side == 'r') {
                    data = cq.delete_r();
                } else {
                    data = cq.delete_l();
                }
            }
            break;
          case 3:
            cq.display();
            break;
        }
    } while (ch != 4);
    getch();
}
```

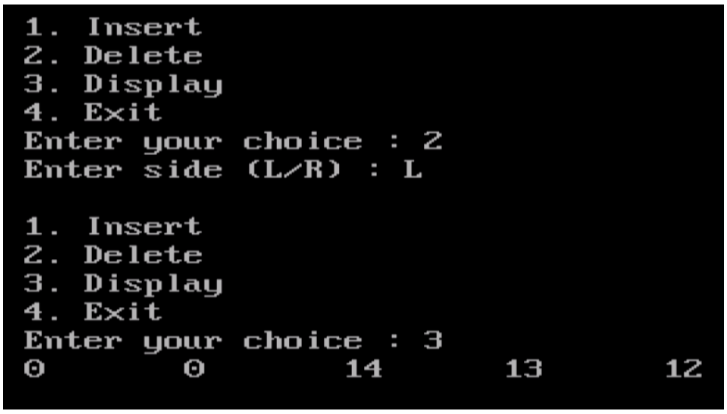
OUTPUT:



```
Output Restricted...
Enter restricted side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 1
Enter data : 12
Enter side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 1
Enter data : 13
Enter side (L/R) : L
```



```
Enter your choice : 1
Enter data : 14
Enter side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 1
Enter data : 15
Enter side (L/R) : L

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice : 3
0       15      14      13      12
```



```
 1. Insert
 2. Delete
 3. Display
 4. Exit
 Enter your choice : 2
 Enter side (L/R) : L

 1. Insert
 2. Delete
 3. Display
 4. Exit
 Enter your choice : 3
 0       0       14      13      12
```