OOP & DS-Journal

Question 1

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.

1).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.

Solution

```
#include<iostream.h>
#include<conio.h>
const int minimum=50;
void main()
{
	float total,unit,additional=0;
	char name[20];
	clrscr();
	cout<<"Enter Name :- ";
	cin>>name;
	cout<<"Enter Unit :- ";
	cin>>unit;
	if(unit<=100)
		total=(unit*0.6)+minimum;
	else if(unit<=300)
		total=(unit*0.6)+((unit-100)*0.8)+minimum;
	else
		total=(unit*0.6)+((unit-100)*0.8)+((unit-300)*0.9)+minimum;
	if(total>300)
	{
		additional=total*0.15;
		total+=additional;
	}
	cout<<"Name :- "<<name<<endl;
	cout<<"Units Consumed :- "<<unit<<endl;
	cout<<"Additional Charges :- "<<additional<<endl;
	cout<<"Minimum Charges :- "<<minimum<<endl;
	cout<<"Total :- "<<total;
```


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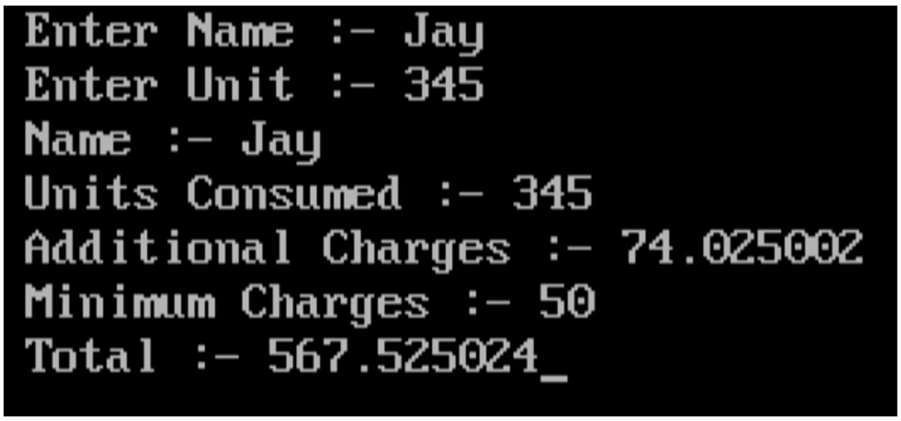
Division :- D
Roll No :- 718

```
        getch();
    }
```

Output



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Question 2

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 customers.

Solution

```
#include<iostream.h>
#include<conio.h>
class bank
{
        protected:
                char name[20],type[10];
                float amount;
        public:
                int acno;
                void getdata()
                {
                        cout<<"\n\nEnter Name :- ";
                        cin>>name;
                        cout<<"Enter Account Number :- ";
                        cin>>acno;
                        cout<<"Enter Type Of Account :- ";
                        cin>>type;
                        cout<<"Enter Deposited Amount To Open Account :-";
                        cin>>amount;
                        cout<<"Your Account Opened Successfully..."<<endl;
                }
                void deposit()
                {
                        float d;
                        cout<<"\n\nEnter Amount to Deposit :- ";
                        cin>>d;
                        amount+=d;
                        cout<<"Amount Successfully Deposited To your
Account..."<<endl;
```


Name :- Gheewala Jay Kanaiyalal
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Roll No :- 718

```
		}
		void withdraw()
		{
			float w;
			cout<<"\n\nEnter Amount To Withdraw :- ";
			cin>>w;
			if(w>amount)
			{
				cout<<"You have insufficient Balance..."<<endl;
				return;
			}
			amount-=w;
			cout<<"Amount Successfully Withdrawn..."<<endl;
		}
		void display()
		{
			cout<<"\n\nName :- "<<name<<endl;
			cout<<"Balance :- "<<amount<<endl;
		}
};
void main()
{
	int ch,i,acc,j=0,choice;
	bank b[5];
	clrscr();
	do
	{
		cout<<"\n1.New Account\n2.Existing Account\n3.Exit\n";
		cin>>ch;
		switch(ch)
		{
			case 1:
				b[j].getdata();
				j++;
				break;
			case 2:
				cout<<"\nEnter Account Number :- ";
				cin>>acc;
				for(i=0;i<j;i++)
				{
					if(b[i].acno==acc)
					{
```


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Class :- SYBCA
Division :- D
Roll No :- 718

```
                                        do
                                        {

        cout<<"\n1.Deposit\n2.Withdraw\n3.Display\n4.Exit\n";
                                                cin>>choice;
                                                switch(choice)
                                                {
                                                        case 1:
                                                                b[i].deposit();
                                                                break;
                                                        case 2:
                                                                b[i].withdraw();
                                                                break;
                                                        case 3:
                                                                b[i].display();
                                                                break;
                                                        case 4:
                                                                cout<<"Exitting..."<<endl;
                                                                break;
                                                        default:
                                                                cout<<"Enter Corrct
Choice...";
                                                }
                                          }while(choice!=4);
                                          break;
                                        }
                                }
                                if(i==j)
                                        cout<<"Account Not Found..."<<endl;
                                break;
                        case 3:
                                cout<<"Exitting..."<<endl;
                                break;
                        default:
                                cout<<"Enter Correct Choice...";
                }
        }while(ch!=3);
}
```


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Output

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Question 3

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.

Solution

```
#include<iostream.h>
#include<conio.h>
class Person
{
        protected:
                char name[20];
                int age;
        public:
                void getdata()
                {
                        cout<<"Enter Name :- ";
                        cin>>name;
                        cout<<"Enter Age :- ";
                        cin>>age;
                }
                void display()
                {
                        cout<<"Name :- "<<name<<endl;
                        cout<<"Age :- "<<age<<endl;
                }
};
class Student:public Person
{
        protected:
                float per;
        public:
                void getstu()
                {
                        getdata();
                        cout<<"Enter Percentage :- ";
                        cin>>per;
                }
                void disstu()
                {
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                display();
                cout<<"Percentage :- "<<per<<endl;
        }
};
class Teacher:public Person
{
    protected:
        float salary;
    public:
        void gettea()
        {
            getdata();
            cout<<"Enter Salary :- ";
            cin>>salary;
        }
        void distea()
        {
            display();
            cout<<"Salary :- "<<salary<<endl;
        }
};
void main()
{
        int ch,i,sn,tn;
        Student s[10];
        Teacher t[10];
        do
        {
            cout<<"\n1.Enter Student Details\n2.Display Student\n3.Enter
Teacher Details\n4.Display Teacher Details\n5.Exit";
            cin>>ch;
            switch(ch)
            {
                case 1:
                    cout<<"Enter Number Of Students :- ";
                    cin>>sn;
                    for(i=0;i<sn;i++)
                    {
                        cout<<"Enter Details Of Student
"<<i+1<<" :-\n\n";
                        s[i].getstu();
                    }
```


Name :- Gheewala Jay Kanaiyalal
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Division :- D
Roll No :- 718

```
                                        break;
                                case 2:
                                        for(i=0;i<sn;i++)
                                        {
                                                cout<<"Details Of Student "<<i+1<<" :-
\n\n";
                                                s[i].disstu();
                                        }
                                        break;
                                case 3:
                                        cout<<"Enter Number Of Teachers :- ";
                                        cin>>tn;
                                        for(i=0;i<tn;i++)
                                        {
                                                cout<<"Enter Details Of Teacher
"<<i+1<<" :-\n\n";
                                                t[i].gettea();
                                        }
                                        break;
                                case 4:
                                        for(i=0;i<tn;i++)
                                        {
                                                cout<<"Details Of Teacher "<<i+1<<" :-
\n\n";
                                                t[i].distea();
                                        }
                                        break;
                                }
                        }while(ch!=5);
}
```


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Division :- D
Roll No :- 718

Output

```
1.Enter Student Details
2.Display Student
3.Enter Teacher Details
4.Display Teacher Details
5.Exit
2
Details Of Student 1 :-

Name :- Jay
Age :- 18
Percentage :- 67
Details Of Student 2 :-

Name :- 2
Age :- 19
Percentage :- 76
```

```
 1.Enter Student Details
 2.Display Student
 3.Enter Teacher Details
 4.Display Teacher Details
 5.Exit
 1
 Enter Number Of Students :- 2
 Enter Details Of Student 1 :-

 Enter Name :- Jay
 Enter Age :- 18
 Enter Percentage :- 67
 Enter Details Of Student 2 :-

 Enter Name :- 2
 Enter Age :- 19
 Enter Percentage :- 76
```

```
1.Enter Student Details
2.Display Student
3.Enter Teacher Details
4.Display Teacher Details
5.Exit
3
Enter Number Of Teachers :- 2
Enter Details Of Teacher 1 :-

Enter Name :- Rajesh
Enter Age :- 25
Enter Salary :- 25000
Enter Details Of Teacher 2 :-

Enter Name :- Kamlesh
Enter Age :- 36
Enter Salary :- 30000
```


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Class :- SYBCA
Division :- D
Roll No :- 718

```
1.Enter Student Details
2.Display Student
3.Enter Teacher Details
4.Display Teacher Details
5.Exit
4
Details Of Teacher 1 :-

Name :- Rajesh
Age :- 25
Salary :- 25000
Details Of Teacher 2 :-

Name :- Kamlesh
Age :- 36
Salary :- 30000
```


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Question 4

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.

Solution

```
#include<iostream.h>
#include<conio.h>
class Student
{
        protected:
                char name[20];
                int no,m1,m2,m3;
                float per;
        public:
                void getdata()
                {
                        cout<<"Enter Roll No :- ";
                        cin>>no;
                        cout<<"Enter Name :- ";
                        cin>>name;
                        cout<<"Enter Marks1 :- ";
                        cin>>m1;
                        cout<<"Enter Marks2 :- ";
                        cin>>m2;
                        cout<<"Enter Marks3 :- ";
                        cin>>m3;
                }
                void percentage()
                {
                        getdata();
                        per=(m1+m2+m3)/3.0;
                        cout<<"Percentage :- "<<per;
                }
};
void main()
{
        Student s;
        clrscr();
        s.percentage();getch();
}
```


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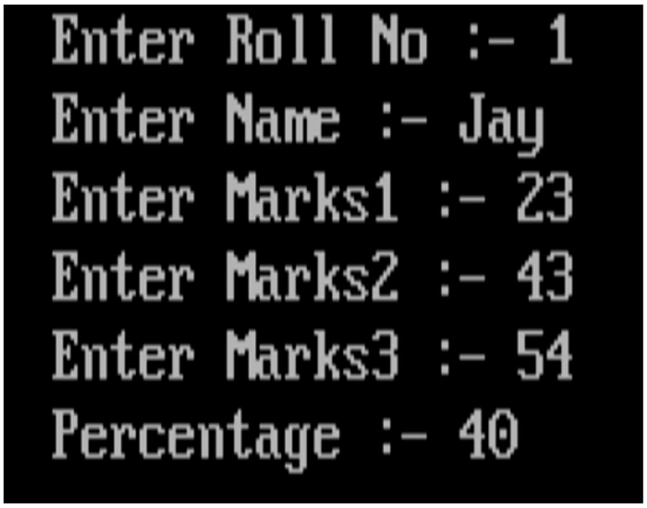
Division :- D
Roll No :- 718

Output



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Class :- SYBCA
Division :- D
Roll No :- 718

Question 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.

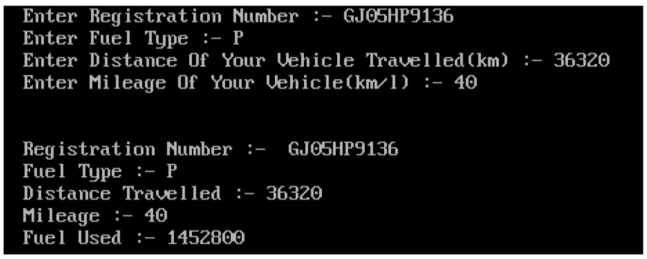
Solution

```
#include<iostream.h>
#include<conio.h>
class Vehicle
{
        protected:
                char rn[20],ftype[10];
        public:
                virtual void getdata()
                {
                        cout<<"Enter Registration Number :- ";
                        cin>>rn;
                        cout<<"Enter Fuel Type :- ";
                        cin>>ftype;
                }
                virtual void display()
                {
                        cout<<"\n\nRegistration Number :-  "<<rn<<endl;
                        cout<<"Fuel Type :- "<<ftype<<endl;
                }
};
class Two_wheeler:public Vehicle
{
        protected:
                float distance,mileage;
        public:
                void getdata()
                {
                        cout<<"Enter Distance Of Your Vehicle Travelled(km) :- ";
                        cin>>distance;
                        cout<<"Enter Mileage Of Your Vehicle(km/l) :- ";
                        cin>>mileage;
                }
                void display()
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                {
                        cout<<"Distance Travelled :- "<<distance<<endl;
                        cout<<"Mileage :- "<<mileage<<endl;
                        cout<<"Fuel Used :- "<<distance*mileage<<endl;
                }
};
void main()
{
        Vehicle v;
        Two_wheeler t;
        Vehicle *v1=&v,*t1=&t;
        clrscr();
        v1->getdata();
        t1->getdata();
        v1->display();
        t1->display();
        getch();
}
```

Output



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Division :- D
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Question 6

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.

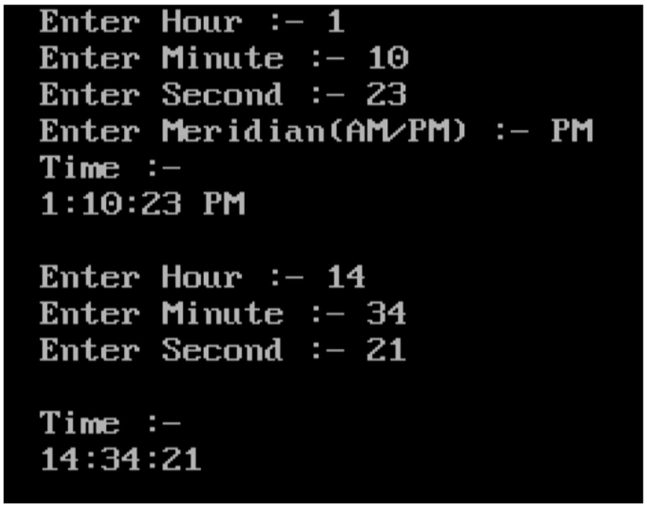
Solution

```
#include<iostream.h>
#include<conio.h>
class Time12
{
        protected:
                int h,m,s;
                char mer[2];
        public:
                void gettime()
                {
                        cout<<"Enter Hour :- ";
                        cin>>h;
                        cout<<"Enter Minute :- ";
                        cin>>m;
                        cout<<"Enter Second :- ";
                        cin>>s;
                        cout<<"Enter Meridian(AM/PM) :- ";
                        cin>>mer;
                }
                void display()
                {
                        gettime();
                        cout<<"Time :-\n";
                        cout<<h<<":"<<m<<":"<<s<<" "<< mer;
                }
};
class Time24
{
        protected:
                int h,m,s;
        public:
                void gettime()
                {
                        cout<<"Enter Hour :- ";
                        cin>>h;
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                cout<<"Enter Minute :- ";
                cin>>m;
                cout<<"Enter Second :- ";
                cin>>s;
        }
        void display()
        {
                gettime();
                cout<<"Time :-\n";
                cout<<h<<":"<<m<<":"<<s;
        }
};
void main()
{
        Time12 t1;
        Time24 t2;
        clrscr();
        t1.display();
        t2.display();
        getch();
}
```

Output



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Class :- SYBCA
Division :- D
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Question 7

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.

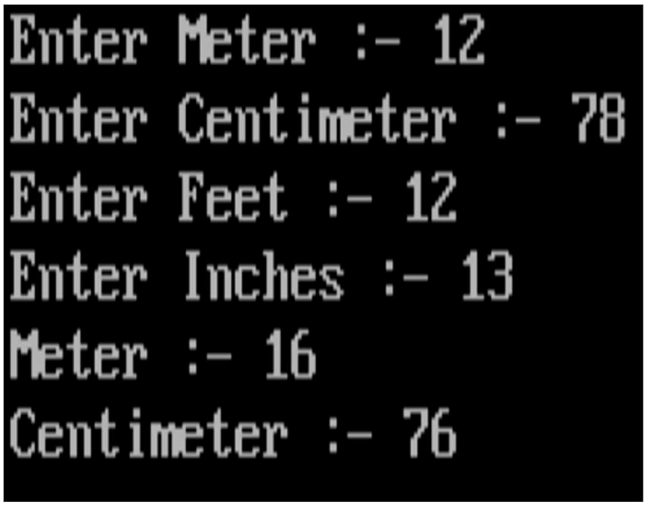
Solution

```
#include<iostream.h>
#include<conio.h>
class DB;
class DM
{
        protected:
                int m,cm;
        public:
                DM()
                {
                        cout<<"Enter Meter :- ";
                        cin>>m;
                        cout<<"Enter Centimeter :- ";
                        cin>>cm;
                }
                friend void add(DM m,DB b);
};
class DB
{
        protected:
                int f,i;
        public:
                DB()
                {
                        cout<<"Enter Feet :- ";
                        cin>>f;
                        cout<<"Enter Inches :- ";
                        cin>>i;
                }
                friend void add(DM m,DB b);
};
void add(DM m,DB b)
{
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
        float m1,cm;
        cm=m.cm+(b.i*2.54)+(b.f*30.48);
        m1=m.m+(int)(cm/100);
        cm=(int)cm%100;
        cout<<"Meter :- "<<m1<<endl;
        cout<<"Centimeter :- "<<cm<<endl;
}
void main()
{
        clrscr();
        DM m;
        DB b;
        add(m,b);
        getch();
}
```

Output



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Division :- D
Roll No :- 718

Question 8

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.

Solution

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
class Telephone
{
	protected:
		char name[20][20];
		long int tno[20];
		int i,j;
	public:
		Telephonr()
		{
			i=0;
		}
		void add()
		{
			cout<<"Enter Name :- ";
			cin>>name[i];
			cout<<"Enter Telephone Number :- ";
			cin>>tno[i];
			i++;
		}
		void show(char nm[20])
		{
			for(j=0;j<i;j++)
			{
				if(strcmp(nm,name[j])==0)
				{
					cout<<"Telephone Number :- "<<tno[j]<<endl;
					break;
				}
			}
			if(j==i)
				cout<<"Name Not Found..."<<endl;
		}
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
};
void main()
{
	int ch;
	char nm[20];
	Telephone t;
	clrscr();
	do
	{
		cout<<"\n1.Add\n2.Show\nEnter Choice :- ";
		cin>>ch;
		switch(ch)
		{
			case 1:
				t.add();
				break;
			case 2:
				cout<<"Enter Name To Search Number :- ";
				cin>>nm;
				t.show(nm);
				break;
			case 3:
				break;
			default:
				cout<<"Enter Correct Choice...";
		}
	}while(ch!=3);
	getch();
}
```


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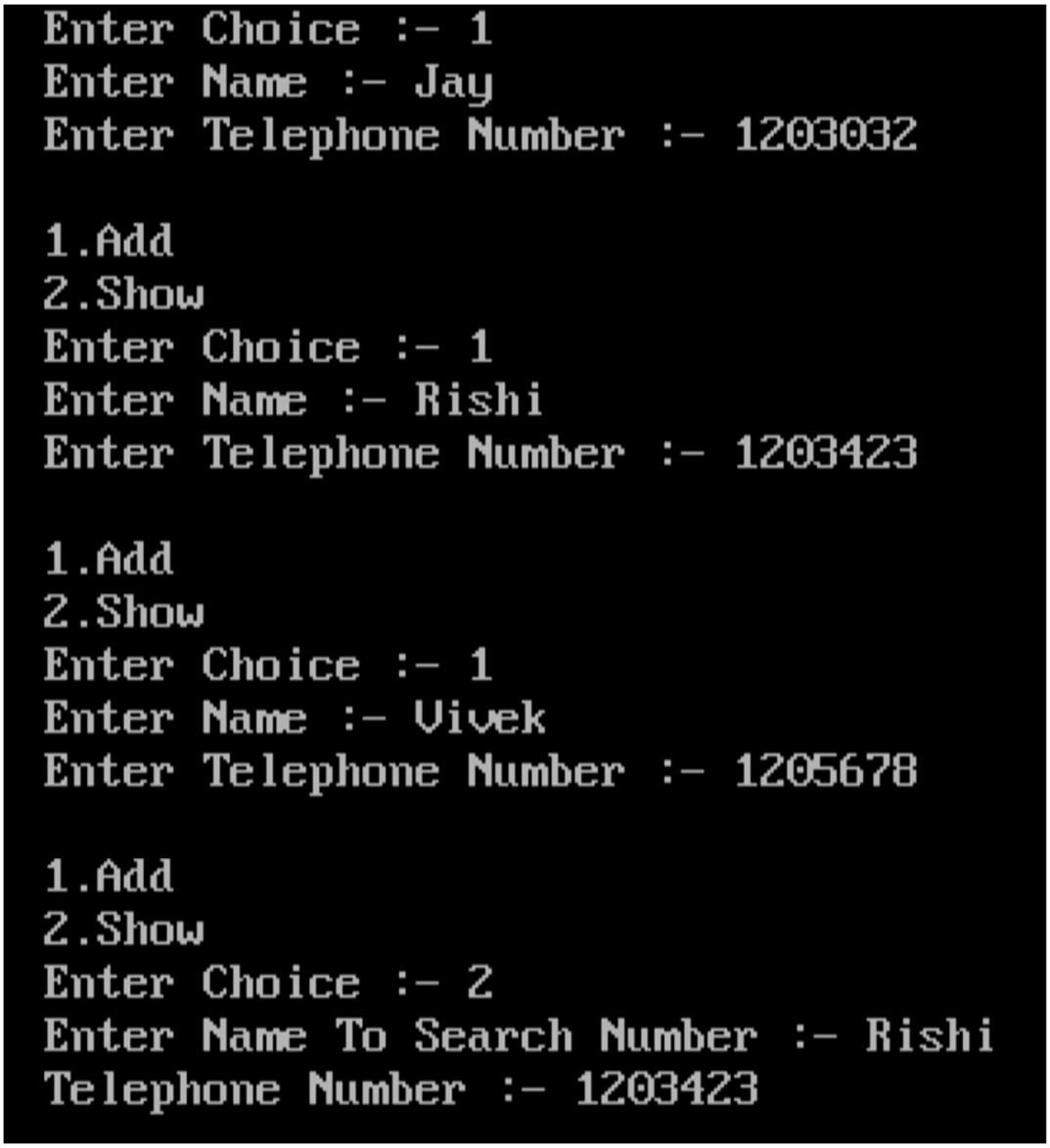
Division :- D
Roll No :- 718

Output



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Question 9

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

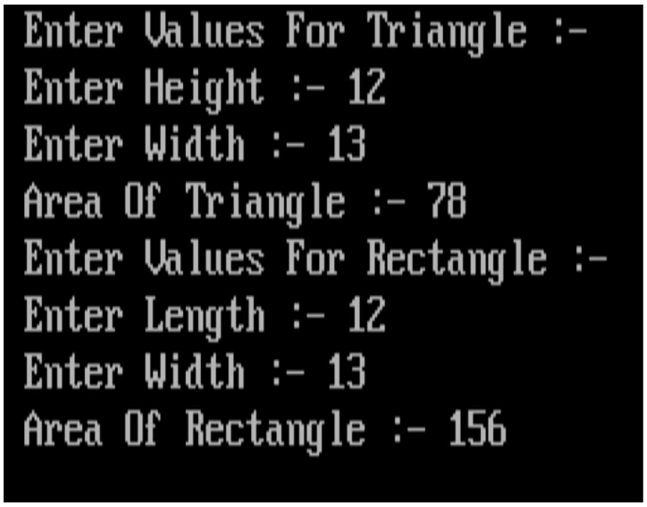
Solution

```
#include<iostream.h>
#include<conio.h>
class Shape
{
	protected:
		double w,h;
	public:
		virtual void getdata()=0;
		virtual void area()=0;
};
class Triangle:public Shape
{
	public:
		void getdata()
		{
			cout<<"Enter Values For Triangle :-\n";
			cout<<"Enter Height :- ";
			cin>>h;
			cout<<"Enter Width :- ";
			cin>>w;
		}
		void area()
		{
			cout<<"Area Of Triangle :- "<<(h*w)/2;
		}
};
class Rectangle:public Shape
{
	public:
		void getdata()
		{
			cout<<"\nEnter Values For Rectangle :-\n";
			cout<<"Enter Length :- ";
			cin>>h;
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                cout<<"Enter Width :- ";
                cin>>w;
        }
        void area()
        {
                cout<<"Area Of Rectangle :- "<<h*w;
        }
};
void main()
{
        clrscr();
        Shape *t,*r;
        t=new Triangle();
        r=new Rectangle();
        t->getdata();
        t->area();
        r->getdata();
        r->area();
        getch();
}
```

Output



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Class :- SYBCA
Division :- D
Roll No :- 718

Question 10

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

Solution

```
#include<iostream.h>
#include<conio.h>
const int n=5;
int s[n],top=-1;
class Stack
{
	public:
	void push(int data)
	{
		if(top==n-1)
		{
			cout<<"Stack is Overflow..."<<endl;
			return;
		}
		top++;
		s[top]=data;
	}
	int pop()
	{
		if(top==-1)
		{
			cout<<"Stack is Underflow..."<<endl;
			return 0;
		}
		int data=s[top];
		top--;
		return data;
	}
	void peep()
	{
		int loc;
		cout<<"Enter Location From Top :- ";
		cin>>loc;
		if(top-loc+1<0)
		{
			cout<<"There is no value..."<<endl;
			return;
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                }
                cout<<"Value at "<<loc<<" from Top :- "<<s[top-loc+1]<<endl;
        }
        void update()
        {
                int loc,data;
                cout<<"Enter Location From Top :- ";
                cin>>loc;
                if(top-loc+1<0)
                {
                        cout<<"There is no value..."<<endl;
                        return;
                }
                cout<<"Value at "<<loc<<" from Top :- "<<s[top-loc+1]<<endl;
                cout<<"Enter New Value :- ";
                cin>>data;
                s[top-loc+1]=data;
                cout<<"Value Updated..."<<endl;
        }
        void display()
        {
                int i;
                if(top==-1)
                {
                        cout<<"Stack is Underflow..."<<endl;
                        return;
                }
                for(i=top;i>=0;i--)
                        cout<<s[i]<<endl;
        }
};
void main()
{
        int ch,data;
        Stack s1;
        clrscr();
        do
        {
                cout<<"1.Push\n2.Pop\n3.Peep\n4.Update\n5.Display\n6.Exit\n";
                cin>>ch;
                switch(ch)
                {
```


Name :- Gheewala Jay Kanaiyalal
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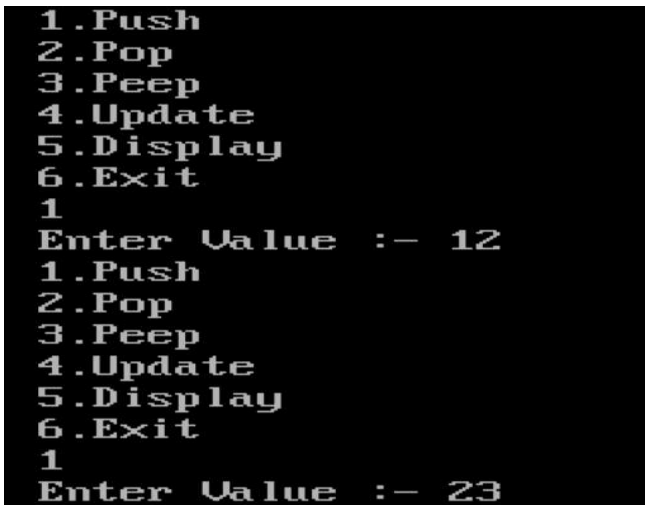
Roll No :- 718

```
                        case 1:
                                cout<<"Enter Value :- ";
                                cin>>data;
                                s1.push(data);
                                break;
                        case 2:
                                cout<<"Removed Value :- "<<s1.pop()<<endl;
                                break;
                        case 3:
                                s1.peep();
                                break;
                        case 4:
                                s1.update();
                                break;
                        case 5:
                                s1.display();
                                break;
                        case 6:
                                break;
                        default:
                                cout<<"Enter Correct Choice..."<<endl;
                }
        }while(ch!=6);
        getch();
}
```

Output



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Division :- D
Roll No :- 718

```
1.Push
2.Pop
3.Peep
4.Update
5.Display
6.Exit
1
Enter Value :- 34
```

```
1.Push
2.Pop
3.Peep
4.Update
5.Display
6.Exit
3
Enter Location From Top :- 2
Value at 2 from Top :- 23
```

```
1.Push
2.Pop
3.Peep
4.Update
5.Display
6.Exit
4
Enter Location From Top :- 1
Value at 1 from Top :- 34
Enter New Value :- 56
Value Updated...
```


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Division :- D
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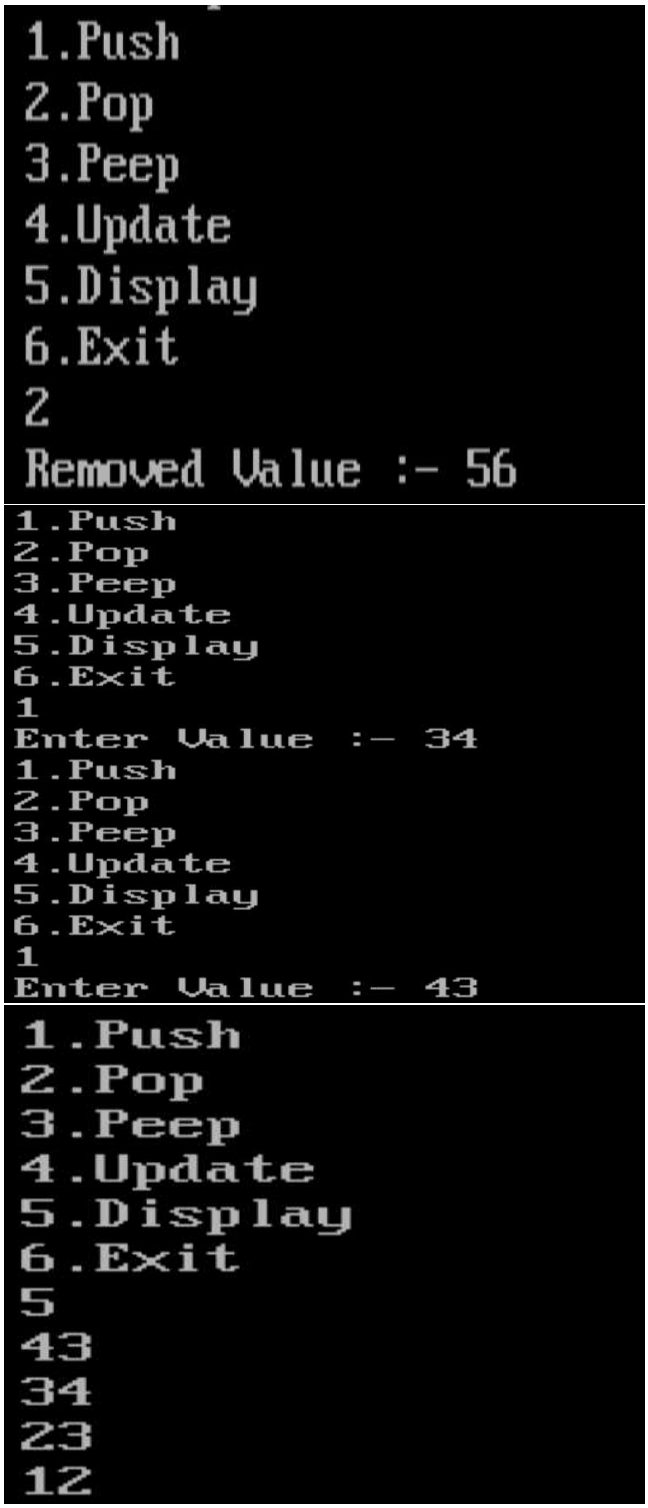

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Class :- SYBCA
Division :- D
Roll No :- 718

Question 11

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

Solution

```
#include<iostream.h>
#include<conio.h>
const int n=20;
char s[n];
int top=-1;
class Stack
{
	public:
		void push(char data)
		{
			top++;
			s[top]=data;
		}
		char pop()
		{
			char data=s[top];
			top--;
			return data;
		}
		int priority(char op)
		{
			switch(op)
			{
				case '^':
					return 3;
				case '*':case '/':
					return 2;
				case '+':case '-':
					return 1;
				default:
					return 0;
			}
		}
};
void main()
{
```


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Class :- SYBCA
Division :- D
Roll No :- 718

```
        char in[n],post[n];
        int i,j=0;
        Stack st;
        clrscr();
        cout<<"Enter Infix Expression :- ";
        cin>>in;
        for(i=0;in[i]!='\0';i++)
        {
                switch(in[i])
                {
                        case '(':
                                st.push(in[i]);
                                break;
                        case '^':case '*':case '/':case '+':case '-':
                                while(st.priority(s[top])>=st.priority(in[i]))
                                        post[j++]=st.pop();
                                st.push(in[i]);
                                break;
                        case ')':
                                while(s[top]!='(')
                                        post[j++]=st.pop();
                                st.pop();
                                break;
                        default:
                                post[j++]=in[i];
                }
        }
        while(top>-1)
                post[j++]=st.pop();
        post[j]='\0';
        cout<<"Postfix Expression :- "<<post;
        getch();
}
```

Output

```
Enter Infix Expression :- a*(b+(c-a)/d)-c*d
Postfix Expression :- abca-d/+*cd*-_
```


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Class :- SYBCA
Division :- D
Roll No :- 718

Question 12

Write Program to convert Infix to Prefix Expression using class and object

Solution

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
const int n=20;
char s[n];
int top=-1;
class Stack
{
        public:
                void push(char data)
                {
                        top++;
                        s[top]=data;
                }
                char pop()
                {
                        char data=s[top];
                        top--;
                        return data;
                }
                int priority(char op)
                {
                        switch(op)
                        {
                                case '^':
                                        return 3;
                                case '*':case '/':
                                        return 2;
                                case '+':case '-':
                                        return 1;
                                default:
                                        return 0;
                        }
                }
};
void main()
{
```


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Class :- SYBCA
Division :- D
Roll No :- 718

```
        char in[n],pre[n];
        int i,j=0;
        Stack st;
        clrscr();
        cout<<"Enter Infix Expression :- ";
        cin>>in;
        strrev(in);
        for(i=0;in[i]!='\0';i++)
        {
                switch(in[i])
                {
                        case ')':
                                st.push(in[i]);
                                break;
                        case '^':case '*':case '/':case '+':case '-':
                                while(st.priority(s[top])>=st.priority(in[i]))
                                        pre[j++]=st.pop();
                                st.push(in[i]);
                                break;
                        case '(':
                                while(s[top]!=')')
                                        pre[j++]=st.pop();
                                st.pop();
                                break;
                        default:
                                pre[j++]=in[i];
                }
        }
        while(top>-1)
                pre[j++]=st.pop();
        pre[j]='\0';
        strrev(pre);
        cout<<"Prefix Expression :- "<<pre;
        getch();
}
```

Output

```
Enter Infix Expression :- a*(b+(c-a)/d)-c*d
Prefix Expression :- -*a+b/-cad*cd_
```


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Division :- D
Roll No :- 718

Question 13

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

Solution

```
#include<iostream.h>
#include<conio.h>
const n=5;
int f=-1,r=-1,q[n];
class Queue
{
        public:
                void enqueue(int data)
                {
                        if(r==n-1)
                        {
                                cout<<"Queue is Overflow..."<<endl;
                                return;
                        }
                        r++;
                        q[r]=data;
                        if(f==-1)
                                f++;
                }
                int dequeue()
                {
                        int data;
                        if(f==-1)
                        {
                                cout<<"Queue is Underflow..."<<endl;
                                return 0;
                        }
                        data=q[f];
                        if(f==r)
                                f=r=-1;
                        else
                                f++;
                        return data;
                }
                void display()
                {
```


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Roll No :- 718

```
                        int i;
                        if(f==-1)
                        {
                                cout<<"Queue is Underflow..."<<endl;
                                return;
                        }
                        for(i=f;i<=r;i++)
                                cout<<q[i]<<"\t";
                }
};
void main()
{
        int ch,data;
        Queue q1;
        clrscr();
        do
        {
                cout<<"\n1.Enqueue\n2.Dequeue\n3.Display\n4.Exit\n";
                cin>>ch;
                switch(ch)
                {
                        case 1:
                                cout<<"Enter Value :- ";
                                cin>>data;
                                q1.enqueue(data);
                                break;
                        case 2:
                                cout<<"Removed Data :- "<<q1.dequeue()<<endl;
                                break;
                        case 3:
                                q1.display();
                                break;
                        case 4:
                                break;
                        default:
                                cout<<"Enter Correct Choice..."<<endl;
                }
        }while(ch!=4);
        getch();
}
```


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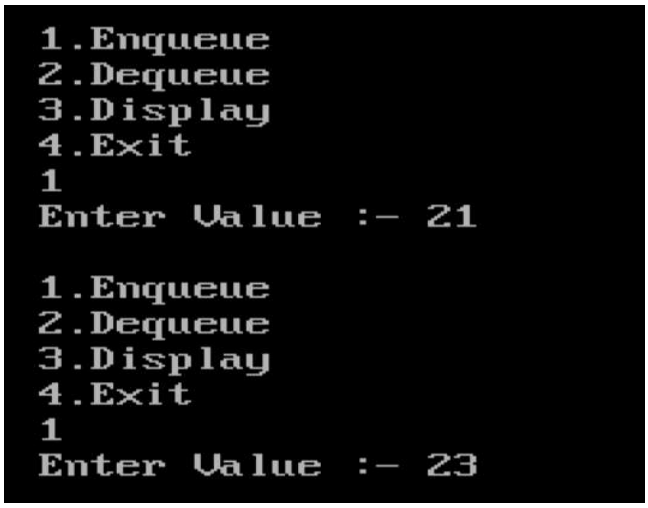
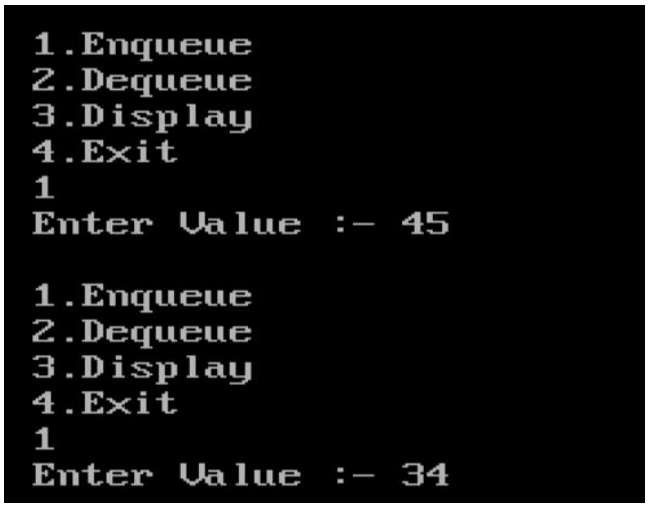
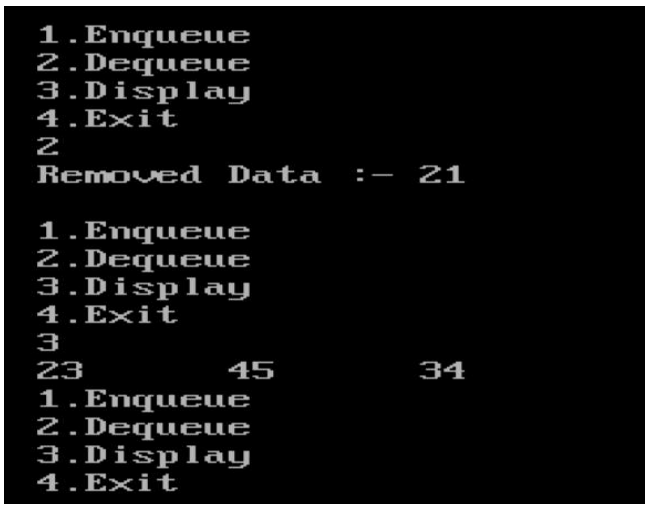
Roll No :- 718

Output







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Division :- D
Roll No :- 718

Question 14

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

Solution

```
#include<iostream.h>
#include<conio.h>
const int n=5;
int f=-1,r=-1,q[n];
class Queue
{
        public:
                void enqueue(int data)
                {
                        if((r==n-1 && f==0)||r+1==f)
                        {
                                cout<<"Queue is Overflow..."<<endl;
                                return;
                        }
                        if(r==n-1)
                                r=0;
                        else
                                r++;
                        q[r]=data;
                        if(f==-1)
                                f++;
                }
                int dequeue()
                {
                        int data;
                        if(f==-1)
                        {
                                cout<<"Queue is Underflow..."<<endl;
                                return 0;
                        }
                        data=q[f];
                        if(f==r)
                                f=r=-1;
                        else if(f==n-1)
                                f=0;
                        else
```


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Division :- D
Roll No :- 718

```
                        f++;
                return data;
        }
        void display()
        {
                int i;
                if(f==-1)
                {
                        cout<<"Queue is 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";
                }
        }
};
void main()
{
        int ch,data;
        Queue q1;
        clrscr();
        do
        {
                cout<<"\n1.Enqueue\n2.Dequeue\n3.Display\n4.Exit\n";
                cin>>ch;
                switch(ch)
                {
                        case 1:
                                cout<<"Enter Value :- ";
                                cin>>data;
                                q1.enqueue(data);
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                        break;
                case 2:
                        cout<<"Removed Data :- "<<q1.dequeue()<<endl;
                        break;
                case 3:
                        q1.display();
                        break;
                case 4:
                        break;
                default:
                        cout<<"Enter Correct Choice..."<<endl;
                }
        }while(ch!=4);
        getch();
}
```


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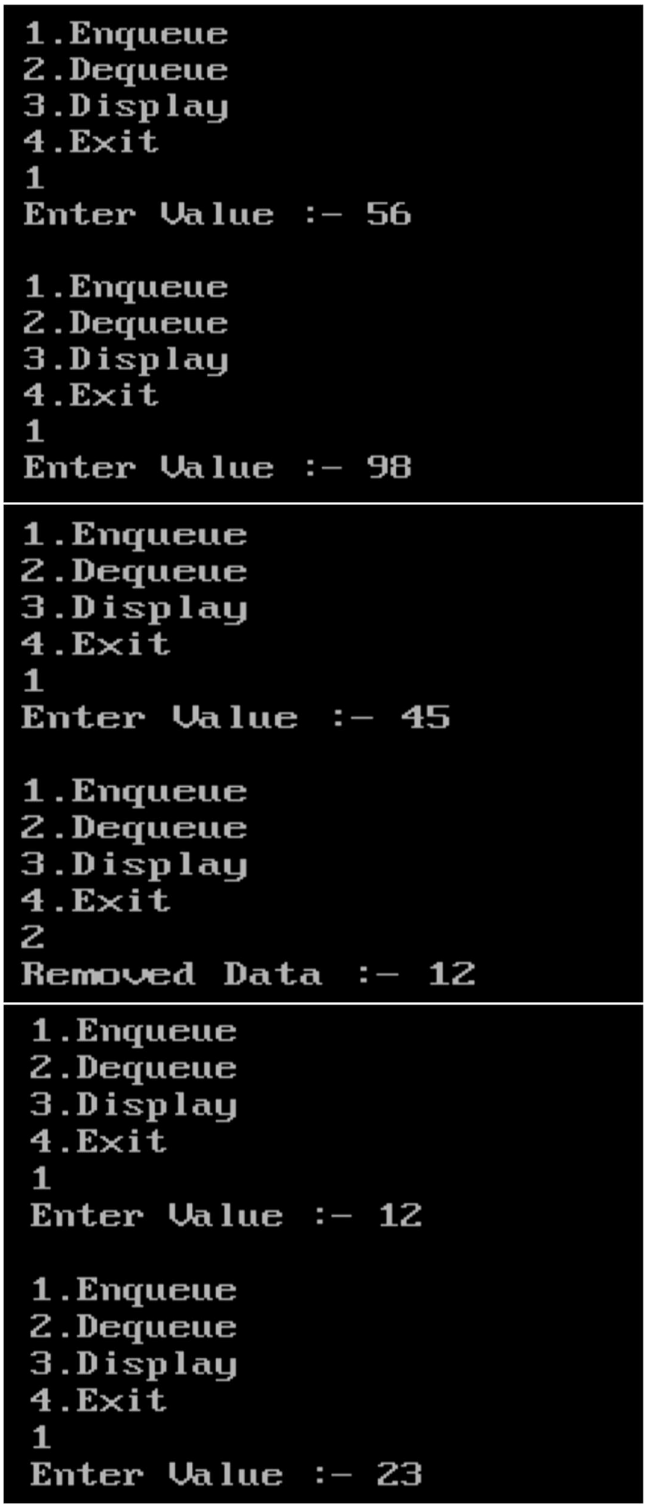
Class :- SYBCA
Division :- D
Roll No :- 718

Output



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Class :- SYBCA
Division :- D
Roll No :- 718

```
1.Enqueue
2.Dequeue
3.Display
4.Exit
1
Enter Value :- 23

1.Enqueue
2.Dequeue
3.Display
4.Exit
3
23      56      98      45      23
```


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Division :- D
Roll No :- 718

Question 15

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

Solution

```
#include<iostream.h>
#include<conio.h>
const int n=5;
int dq[n],f=-1,r=-1;
class Queue
{
	public:
		void insert_front(int data)
		{
			if(f==0)
			{
				cout<<"Dequeue is Overflow"<<endl;
				return;
			}
			if(f==-1)
				f=r=n-1;
			else
				f--;
			dq[f]=data;
		}
		void insert_rear(int data)
		{
			if(r==n-1)
			{
				cout<<"Dequeue is Overflow"<<endl;
				return;
			}
			r++;
			dq[r]=data;
			if(f==-1)
				f++;
		}
		int delete_front()
		{
			if(f==-1)
			{
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                        cout<<"Dequeue is Underflow"<<endl;
                        return 0;
                }
                int data=dq[f];
                dq[f]=0;
                if(f==r)
                        f=r=-1;
                else
                        f++;
                return data;
        }
        int delete_rear()
        {
                if(r==-1)
                {
                        cout<<"Dequeue is Underflow"<<endl;
                        return 0;
                }
                int data=dq[r];
                dq[r]=0;
                if(f==r)
                        f=r=-1;
                else
                        r--;
                return data;
        }
        void display()
        {
                int i;
                if(f==-1)
                {
                        cout<<"Dequeue is Underflow..."<<endl;
                        return;
                }
                for(i=0;i<n;i++)
                        cout<<dq[i]<<"\t";
        }
};
void main()
{
        int ch,data;
        char rside,side;
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
        Queue q1;
        clrscr();
        cout<<"\nEnter Restricted Side(L/R) :- ";
        cin>>rside;
        do
        {
                cout<<"\n\n1.Insert\n2.Delete\n3.Display\n4.Exit\nEnter Choice :- ";
                cin>>ch;
                switch(ch)
                {
                        case 1:
                                cout<<"Enter Value :- ";
                                cin>>data;
                                if(rside=='L')
                                        q1.insert_rear(data);
                                else
                                        q1.insert_front(data);
                                break;
                        case 2:
                                int del;
                                cout<<"Enter Side To Delete Data(L/R) :- ";
                                cin>>side;
                                if(side=='L')
                                        del=q1.delete_front();
                                else
                                        del=q1.delete_rear();
                                if(del!=0)
                                        cout<<"Deleted Value :- "<<del<<endl;
                                break;
                        case 3:
                                q1.display();
                                break;
                        case 4:
                                cout<<"Exitting...";
                                break;
                        default:
                                cout<<"Enter Correct Choice...";
                }
        }while(ch!=4);
        getch();
}
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

Output

```
Enter Restricted Side(L/R) :- R


1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 1
Enter Value :- 23


1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 1
Enter Value :- 22
```

```
1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 3
0       0       0       22      23

1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 1
Enter Value :- 21
```

```
 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 2
 Enter Side To Delete Data(L/R) :- R
 Deleted Value :- 23


 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 3
 0       0       21      22      0
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 2
Enter Side To Delete Data(L/R) :- L
Deleted Value :- 21


1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 3
0       0       0       22      0
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

Question 16

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

Solution

```
#include<iostream.h>
#include<conio.h>
const int n=5;
int dq[n],f=-1,r=-1;
class Queue
{
	public:
		void insert_front(int data)
		{
			if(f==0)
			{
				cout<<"Dequeue is Overflow"<<endl;
				return;
			}
			if(f==-1)
				f=n-1;
			else
				f--;
			dq[f]=data;
		}
		void insert_rear(int data)
		{
			if(r==n-1)
			{
				cout<<"Dequeue is Overflow"<<endl;
				return;
			}
			r++;
			dq[r]=data;
		}
		int delete_front()
		{
			if(f==-1)
			{
				cout<<"Dequeue is Underflow"<<endl;
				return 0;
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
                }
                int data=dq[f];
                dq[f]=0;
                if(f==r)
                        f=r=-1;
                else
                        f++;
                return data;
        }
        int delete_rear()
        {
                if(r==-1)
                {
                        cout<<"Dequeue is Underflow"<<endl;
                        return 0;
                }
                int data=dq[r];
                dq[r]=0;
                if(f==r)
                        f=r=-1;
                else
                        r--;
                return data;
        }
        void display()
        {
                int i;
                if(f==-1)
                {
                        cout<<"Dequeue is Underflow..."<<endl;
                        return;
                }
                for(i=0;i<n;i++)
                        cout<<dq[i]<<"\t";
        }
};
void main()
{
        int ch,data;
        char rside,side;
        Queue q1;
        clrscr();
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

```
        cout<<"\nEnter Restricted Side(L/R) :- ";
        cin>>rside;
        do
        {
                cout<<"\n\n1.Insert\n2.Delete\n3.Display\n4.Exit\nEnter Choice :- ";
                cin>>ch;
                switch(ch)
                {
                        case 1:
                                cout<<"Enter Value :- ";
                                cin>>data;
                                cout<<"Enter Side To Delete Data(L/R) :- ";
                                cin>>side;
                                if(side=='R')
                                        q1.insert_rear(data);
                                else
                                        q1.insert_front(data);
                                break;
                        case 2:
                                int del;
                                if(rside=='R')
                                        del=q1.delete_front();
                                else
                                        del=q1.delete_rear();
                                if(del!=0)
                                        cout<<"Deleted Value :- "<<del<<endl;
                                break;
                        case 3:
                                q1.display();
                                break;
                        case 4:
                                cout<<"Exitting...";
                                break;
                        default:
                                cout<<"Enter Correct Choice...";
                }
        }while(ch!=4);
        getch();
}
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718

Output

```
 Enter Restricted Side(L/R) :- L


 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 1
 Enter Value :- 21
 Enter Side To Delete Data(L/R) :- R


 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 1
 Enter Value :- 21
 Enter Side To Delete Data(L/R) :- L
```

```
1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 3
21      0       0       0       21

1.Insert
2.Delete
3.Display
4.Exit
Enter Choice :- 1
Enter Value :- 22
Enter Side To Enter Data(L/R) :- R
```

```
 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 3
 21      22      0       0       21

 1.Insert
 2.Delete
 3.Display
 4.Exit
 Enter Choice :- 2
 Deleted Value :- 22
```


Name :- Gheewala Jay Kanaiyalal
Class :- SYBCA
Division :- D
Roll No :- 718