Question 1

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;

int main()
{

	string arr;
	cout<<"Enter the string: ";
	cin>>arr;
	int count=0;
	int length = arr.size();
	for (const char *i=arr.c_str() ; i < arr.c_str() + arr.size() ; ++i)
	{
		switch(*i)
		{

			case 'A':
			case 'a':
			case 'E':
			case 'e':
			case 'O':
			case 'o':
			case 'I':
			case 'i':
			case 'u':
			case 'U':
				count++;

		}
```

```
	}
	cout<<"No.of vowels are : "<<count<<endl;

	return 0;
}
```

Question 2

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
void reverse(const char *a,int i)
{
	for (const char *j = a+i; j>=a ; j--)
		cout<<*j;
	cout<<endl;
}
int main()
{
	string arr;
	cout<<"Enter the number: ";
	cin>>arr;
	cout<<"The reverse of the number is :";
	reverse(arr.c_str(),arr.size());

	return 0;
}
```

Question 3

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
inline int add(int a,int b)
{
	return a+b;
}
inline int sub(int a,int b)
{
	return a-b;
}
inline int mul(int a,int b)
{
	return a*b;
}
inline int div(int a,int b)
{
	return a/b;
}
inline int mod(int a,int b)
{
	return a%b;
}

int main()
{
	string arr;
	int result;
```

```
	cout<<"Enter the expression: ";
	cin>>arr;
	result = arr[0] - '0';
	for (const char *i = arr.c_str()+1; i<=arr.c_str()+arr.size();
++i)
	{
		if (*(i+1) == '\0') break;
		int j = *(i+1) - '0';
		switch(*i)
		{
		case '+':
			result = add(result,j);
			break;
		case '-':
			result = sub(result,j);
			break;
		case '/':
			result = div(result,j);
			break;
		case '%':
			result = mod(result,j);
			break;
		case '*':
			result = mul(result,j);
			break;
		}
	}
	cout<<"The result is :"<<result<<endl;

	return 0;
}
```

Question 4

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
int count = 0;
class Test
{
public:
	Test()
	{
		count++;
		cout<<"One object created, Total no.of objects :
"<<count<<endl;
	}

	~Test()
	{
		count--;
		cout<<"One object destroyed, Total no.of objects :
"<<count<<endl;
	}

};

int main()
{
	Test obj1;
	Test obj2;

	{
```

```
        Test obj3;
    }



    return 0;
}
```

Question 5

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
class Student {
    int rn;
    string name;
public:
    void set_data(int a, string b)
    {
        rn = a;
        name = b;
    }
    void print()
    {
        cout<<"Roll number of the student is : "<<this-
>rn<<endl;
        cout<<"Name of the student is : "<<this->name<<endl;
```

```
	}


};
int main()
{
	Student obj1;
	obj1.set_data(44,"Shahrukh");
	obj1.print();



	return 0;
}
```

Question 6

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
class C_polygon
{
protected:
	int height,breadth;
public:
	C_polygon(int a,int b){
		height = a;
		breadth = b;
	}
```

```
        virtual float area(){
                cout<<"The area of polygon is : "<<endl;
                return 0;
        }
};

class C_rectangle: public C_polygon
{
public:
        C_rectangle(int a,int b):C_polygon(a,b){}
        virtual float area(){
                cout<<"The area of the rectangle is: ";
                return height*breadth;
        }
};

class C_triangle: public C_polygon
{
public:
        C_triangle(int a,int b):C_polygon(a,b){}
        virtual float area(){
                cout<<"The area of the triangle is: ";
                return float(height*breadth)/2;
        }


};

int main()
{
        C_polygon *pointer;
        C_rectangle objrec(5,3);
        C_triangle objtri(5,3);
        cout<<objrec.area()<<endl;
        cout<<objtri.area()<<endl;
```

```
	pointer = &objrec;
	cout<<pointer->area()<<endl;

	pointer = &objtri;
	cout<<pointer->area()<<endl;


	return 0;
}
```

Question 7

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
int count=0;
class Bank
{
public:
	void operator ++(int ){
		count++;
		cout<<"One person entered the bank.Total number of persons in the bank is: "<<count<<endl;

	}
```

```
	void operator --(int ){
		if (count == 0)
			cout<<"There is no one in the bank !"<<endl;

		else {
			count--;
			cout<<"One person left the bank.Total number of
persons in the bank is: "<<count<<endl;
		}
	}


};

int main()
{
	Bank obj;
	obj++;
	obj++;
	obj++;
	obj++;
	obj++;
	obj--;
	obj--;
	obj--;
	obj--;
	obj--;
	obj--;
	obj--;
	obj--;
	return 0;
}
```

Question 8

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;

class Company
{
	int turnover;
public:
	Company (){
		turnover = 0;
	}

	Company (int a){
		turnover = a;
	}

	Company operator +(Company a){
		Company temp;
		temp.turnover = this->turnover + a.turnover;
		return temp;
	}

	Company operator -(Company a){
		Company temp;
		temp.turnover = this->turnover - a.turnover;
		return temp;
	}
	int show()
```

```
	{
		return turnover;
	}
};
int main()
{
	Company c1(1000),c2(500),temp;

	temp = c1 + c2;
	cout<<"The sum of the turnovers is : "<<temp.show()<<endl;

	temp = c1 - c2;
	cout<<"The difference of the turnovers is :
"<<temp.show()<<endl;


	return 0;
}
```

Question 9

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
int i,j;
class Matrix
{
	int a[3][3];
public:
```

```
void get_data(){
	cout<<"Enter the elements of matrix row wise: "<<endl;
	for (i=0;i<3;i++)
		for(j=0;j<3;j++)
		{
			cin>>a[i][j];
		}
}

Matrix operator + (Matrix mat){

	Matrix temp;
	for (i=0;i<3;i++)
		for (j=0;j<3;j++)
		{
			temp.a[i][j] = this->a[i][j] + mat.a[i][j];
		}

	return temp;

}

Matrix operator - (Matrix mat){

	Matrix temp;
	for (i=0;i<3;i++)
		for (j=0;j<3;j++)
		{
			temp.a[i][j] = this->a[i][j] - mat.a[i][j];
		}

	return temp;

}
```

```
        void show(){
                for(i=0;i<3;i++)
                {
                        for(j=0;j<3;j++)
                        {
                                cout<<a[i][j]<<"   ";
                        }
                        cout<<endl;
                }
        }



};
int main()
{
        Matrix a,b,c,d;
        a.get_data();
        b.get_data();

        c = a + b;
        d = a - b;

        cout<<"Matrix A is : "<<endl;
        a.show() ;
        cout<<"Matrix B is : "<<endl;
        b.show();
        cout<<"Sum of the matrix is : "<<endl;
        c.show();
        cout<<"Difference of matrix is : "<<endl;
        d.show();


        return 0;
}
```

Question 10

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;
class Average
{
	float a,b,c,d,e;

	friend void friendfunc1(Average*);
	friend void friendfunc2(Average*);

public:
	float avg()
	{

		return (a+b+c+d+e)/5;
	}


};

void friendfunc1(Average *a1)
{
	float t1,t2;
	cout<<"Enter two numbers: ";
	cin>>t1>>t2;
	a1->a = t1;
	a1->b = t2;
}
```

```
void friendfunc2(Average *a2)
{
	float t1,t2,t3;
	cout<<"Enter three numbers: ";
	cin>>t1>>t2>>t3;
	a2->c = t1;
	a2->d = t2;
	a2->e = t3;
}

int main()
{
	Average obj;
	friendfunc1(&obj);
	friendfunc2(&obj);

	cout<<"The average of the 5 numbers is :
"<<obj.avg()<<endl;


	return 0;
}
```

Question 11

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
```

```
using namespace std;
class Student {
	string name;
	int m[3];
	float average;
public:
	friend void mark_avg(Student *);

	void get_data(){
		cout<<"Enter the name of the student : ";
		cin>>name;
		cout<<"Enter the marks in three subjects: ";
		for (int i=0;i<3;i++)
			cin>>m[i];
	}

	void display(){
		cout<<"Name of the student is : "<<name<<endl;
		cout<<"The average marks obtained in 3 subjects is :
"<<average<<endl;
	}


};

void mark_avg(Student * s)
{
	s->average = (s->m[0]+s->m[1]+s->m[2])/3;
}

int main()
{
	Student obj;
	obj.get_data();
	mark_avg(&obj);
```

```
	obj.display();

	return 0;
}
```

Question 12

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;

template<class T>
T minimum(T a1,T a2)
{
	if (a1 > a2)
		return a2;
	return a1;
}

int main()
{
	int ia=10,ib=15;
	float fa=11.52,fb=15.96;
	char ca='x',cb='n';

	cout<<"The minimum of ia and ib is :
"<<minimum(ia,ib)<<endl;
	cout<<"The minimum of fa and fb is :
```

```
"<<minimum(fa,fb)<<endl;
	cout<<"The minimum of ca and cb is :
"<<minimum(ca,cb)<<endl;

	return 0;
}
```

Question 13

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
using namespace std;

template <class T>
class Pair
{
	T a,b;
public:
	Pair(T x,T y)
	{
		a = x;
		b = y;
	}

	T get_max()
	{
		if (a>b)
			return a;
```

```
            return b;
        }

};

int main()
{

        Pair <int> obj1(5,6);
        Pair <float> obj2(5.5,8.9);
        cout<<"The maximum of two is : "<<obj1.get_max()<<endl;
        cout<<"The maximum of two is : "<<obj2.get_max()<<endl;


        return 0;
}
```

Question 14

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include<iostream>
 using namespace std;
 class Student
 {
    protected:
        char name[50];
        int cls,rollno,age;
        public:
            friend istream & operator >>(istream &din ,Student &a)
```

```
        {
            cout<<"\nEnter Your name :";
            din>>a.name;
            cout<<"\nEnter your class :";
            din>>a.cls;
            cout<<"\nEnter your rollno :";
            din>>a.rollno;
            cout<<"\nEnter your age :";
            din>>a.age;
            return din;
        }
        friend ostream &operator<<(ostream &dout ,Student
&a)
        {
            dout<<"\nYour name :"<<a.name;
            dout<<"\nyour class :"<<a.cls;
            dout<<"\nyour rollno :"<<a.rollno;
            dout<<"\nyour age :"<<a.age;
            return dout;
        }
 };
 int main()
 {
     Student a;
     cin>>a;
     cout<<a;
     return 0;
 }
```

Question 15

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
```

```
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
#include <math.h>
using namespace std;
class Oned
{
protected:
	int x;
};

class Twod : protected Oned
{
protected:
	int y;

};

class Threed : protected Twod
{
	int z;
public:
	void get_data()
	{
		cout<<"Enter the value of x,y and z coordinates
respectively : ";
		cin>>x>>y>>z;
	}
	float operator * (Threed abc)
	{
		float temp;
		temp = (this->x - abc.x)*(this->x - abc.x) + (this->y -
abc.y)*(this->y - abc.y) + (this->z - abc.z)*(this->z - abc.z);
		return sqrt(temp);
	}
```

```
};

int main()
{
	Threed obj1,obj2;
	obj1.get_data();
	obj2.get_data();
	cout<<"The distance between the two entered points is :
"<<obj1*obj2<<endl;
	return 0;
}
```

Question 16

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044


import java.util.Scanner;

public class Calculator {
static int add(int a,int b){
    return a+b;
}
static int sub(int a,int b){
    return a-b;
}
public static void main(String[] args) {
    int mem=0,res;
    Scanner sc= new Scanner(System.in);
```

```
    int ch=0;
    while(ch<=3)

    {
       System.out.println("1. Add  2.Subtract 3.Display M+");
       ch=sc.nextInt();


       switch(ch){
          case 1:
             System.out.println("Enter two numbers");
             res=add(sc.nextInt(),sc.nextInt());
             System.out.println("Sum="+res);
             System.out.println("enter 1 to save in M+ else 0");
             if(sc.nextInt()==1)
                mem=res;
             break;
          case 2:
             System.out.println("Enter two numbers");
             res=sub(sc.nextInt(),sc.nextInt());
             System.out.println("Sum="+res);
             System.out.println("enter 1 to save in M+ else 0");
             if(sc.nextInt()==1)
                mem=res;
             break;
          case 3:System.out.println("M+ ="+mem);
             break;
       }
    }

}

}
```

Question 17

```
// OOPS LAB ASSSIGNMENT
// SUBMITTED BY
// Mohammad Shahrukh    13BCS-0044

#include <iostream>
#include <fstream>
using namespace std;


void add()
{
	string name,contactnumber;
	cout<<"Enter the name and contact number : "<<endl;
	cin>>name>>contactnumber;

	ofstream f;
	f.open("contacts.txt",ios::out | ios::app);
	f<<name<<endl<<contactnumber<<endl;
}

int search()
{
	string name,temp;
	cout<<"Enter the name to be searched : ";
	cin>>name;
	ifstream f;
	f.open("contacts.txt");
	while(getline(f,temp))
	{
```

```
            if (temp == name)
            {
                cout<<"Name is in the contact list !"<<endl;
                return 1;
            }
        }
            cout<<"Name is not found "<<endl;
            return 0;
}

void delete_contact()
 {
        string name,line;
        cout << "Enter the name to be deleted: " <<endl;
        cin >> name;
        ifstream myfile;
        ofstream temp;
        myfile.open("contacts.txt");
        temp.open("temp.txt");
        while ( getline(myfile,line))
        {
            if ( line != name )
            {
                temp << line << endl;
            }
            else
            {
                cout << "The name was present and deleted
successfully.";
                getline(myfile,line);
                getline(myfile,line);
            }
        }
        myfile.close();
        temp.close();
```

```
        remove("contacts.txt");
        rename("temp.txt","contacts.txt");
 }

int main()
{
        int c;
        while (1)
        {
                cout << "Enter the desired option : \n1)Add contact
2)Search contact  3)Delete contact  4)Exit"<<endl;
                cin>>c;
        switch (c)
        {
                case 1:
                        add();
                        break;
                case 2:
                        search();
                        break;
                case 3:
                        delete_contact();
                        break;
                case 4:
                        return 0;
        }
        }
        add();
        search();

        return 0;
}
```