Lab assignment 8
Roll 2005839
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Q1.

```
#include<iostream>
using namespace std;
#include<math.h>
class shape
{
            protected:
            float areaofcuboid,areaofcone,areaofsphere,rc,rh,rs,l,b,h,l1,volofcuboid,volofcone,volofsphere;
            public:
            shape()
            {
                cout<<"base constructor called"<<endl;
            }
           virtual ~shape()
            {
                cout<<"base destructor called"<<endl;
            }
            virtual void area()
            {
            }
            virtual void display()
            {
            }
            virtual void volume()
            {

            }
};
class cuboid:public shape
{
            public:
            ~cuboid()
            {
                cout<<"cuboid destructor is called"<<endl;
            }
            void area()
            {
                        cout<<"\nEnter length,breadth,height of cuboid:";
                        cin>>l>>b>>h;

            }
            void display()
            {
                areaofcuboid=2*(l*b+b*h+l*h);
                        cout<<"\nArea of cuboid:"<<areaofcuboid<<endl;
            }
            void volume()
            {
volofcuboid=l*b*h;
cout<<"volume of cuboid:"<<volofcuboid<<endl;
            }
};
class cone:public shape
{
            public:
  ~cone()
            {
                cout<<"cone destructor is called"<<endl;
            }
            void area()
            {
                        cout<<"\n\nEnter the radius and slantheight:";
                        cin>>rc>>l1;
            }
            void display()
```

```
            {
                        areaofcone=3.14*rc*(rc+l1);
                        cout<<"\nArea of cone:"<<areaofcone<<endl;
            }
            void volume()
            {
                volofcone=(3.14*rc*rc*(pow((l*l-rc*rc),1/2)))/3;
                cout<<"volume of cone is :"<<volofcone<<endl;
            }
};
class sphere:public shape
{
            public:
             ~sphere()
            {
                cout<<"sphere destructor is called"<<endl;
            }
            void area()
            {
                        cout<<"\n\nEnter radius of sphere:";
                        cin>>rs;

            }
            void display()
            {
                        areaofsphere=4*3.14*rs*rs;
                        cout<<"\nArea of sphere:"<<areaofsphere<<endl;
            }
            void volume()
            {
                volofsphere=(3.14*rs*rs*rs*4)/3;
                cout<<"volume of sphere is :"<<volofsphere<<endl;
            }
};
int main()
{
            shape *shape_ptr;
            shape s;
            shape_ptr=&s;
            shape_ptr->area();
            shape_ptr->display();
            cuboid c;
            cone c1;
            sphere s1;
            shape_ptr=&c;
            shape_ptr->area();
            shape_ptr->display();
            shape_ptr->volume();
            shape_ptr=&c1;
            shape_ptr->area();
            shape_ptr->display();
            shape_ptr->volume();
            shape_ptr=&s1;
            shape_ptr->area();
            shape_ptr->display();
            shape_ptr->volume();

return 0;
}
```

Output:
base constructor called
base constructor called
base constructor called
base constructor called

Enter length,breadth,height of cuboid:1 2 3

Area of cuboid:22
volume of cuboid:6

Enter the radius and slantheight:4 5

Area of cone:113.04
volume of cone is :16.7467

Enter radius of sphere: 6

Area of sphere:452.16
volume of sphere is :904.32
sphere destructor is called
base destructor called
cone destructor is called
base destructor called
cuboid destructor is called
base destructor called
base destructor called

Q2.

```
#include<iostream>
using namespace std;
class employee
{
int roll;
char dept[6];
public:
void get()
{
    cout<<"enter the roll:";
    cin>>roll;
    cout<<"enter the dept:";
cin>>dept;
}
void show()
{
    cout<<"roll no:"<<roll<<endl;
    cout<<"dept:"<<dept<<endl;
}
};
class student : virtual public employee
{
int marks[3];
public:
void getmarks()
{
    cout<<"enter the marks in 3 subjects:"<<endl;
    cin>>marks[0]>>marks[1]>>marks[2];
}
int total()
{
    return (marks[0]+marks[1]+marks[2]);
}
};
class faculty : virtual public employee
{

int maxmarks[3];
public:
void getmarks2()
{
    cout<<"enter the max marks in 3 subjects:"<<endl;
    cin>>maxmarks[0]>>maxmarks[1]>>maxmarks[2];
}
int totalmaxmarks()
{
```

```
    return (maxmarks[0]+maxmarks[1]+maxmarks[2]);
}
};
class supervisor:public student,public faculty
{
    public:
void result()
{
    cout<<"marks got "<<total()<<" out of  "<<totalmaxmarks()<<endl;
    float per=(total()/float(totalmaxmarks()))*100;
cout<<"percentage: "<<per<<endl;
}
};
int main(){
 supervisor s1;
 s1.getmarks();
 s1.total();
s1.getmarks2();
s1.totalmaxmarks();
s1.result();
    return 0;
}
```

Output:
enter the marks in 3 subjects:
98 97 96
enter the max marks in 3 subjects:
100 100 100
marks got 291 out of 300
percentage: 97

Q3

```
#include <iostream>
using namespace std;
#include <conio.h>
class student

{
public:
    virtual void getdata() = 0;
    virtual void display() = 0;
};
class science : public student
{
    int r;
    char n[10];
public:
    void getdata()
    {
        cout << "science stream" << endl;
        cout << "enter name";
        cin >> n;
        cout << "enter roll";
        cin >> r;
    }
    void display()
    {
        cout << endl
             << "name=" << n;
        cout << endl
             << "roll=" << r << endl;
    }
};
class arts : public student
{
    int r;
    char n[10];
public:
    void getdata()
    {
```

```
        cout << "arts stream";
        cout << endl
             << "enter name";
        cin >> n;
        cout << "enter roll";
        cin >> r;
    }
    void display()
    {
        cout << endl
             << "name=" << n;
        cout << endl
             << "roll=" << r << endl;
    }
};
int main()
{
    student *ptr[3];
    science s;
    arts a;
    ptr[1] = &a;
    ptr[1]->getdata();
    ptr[1]->display();
    ptr[2] = &s;
    ptr[2]->getdata();
    ptr[2]->display();
    return 0;
}
```

Output:
arts stream
enter name rahul
enter roll 567

name=rahul
roll=567
science stream
enter name daman
enter roll 839

name=daman
roll=839