```
import java.util.Scanner;
public abstract class Solid
{
	double r;
	double h;
	double vol;
	double area;
	abstract void cal_vol();
	abstract void cal_area();
}
class cylinder extends Solid
{
	void getData()
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the radius and height of cylinder
respectively");
		r=sc.nextDouble();
		h=sc.nextDouble();
	}
	void cal_vol()
	{
		vol=3.14*r*r*h;
		System.out.println("Volume of cylinder is ="+vol);
	}
	void cal_area()
	{
		area=2*3.14*r*h+2*3.14*r*r;
		System.out.println("Surface area of cylinder is= "+area);
	}
}
class cone extends Solid
{
	void getData()
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the radius and height of cone respectively");
		r=sc.nextDouble();
		h=sc.nextDouble();
	}
	void cal_vol()
	{
		vol=(3.14*r*r*h)/3;
		System.out.printf("Volume of cone is = %.2f",vol);
		System.out.println();
	}
	void cal_area()
	{
```

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                area=3.14*r*(r+Math.sqrt(h*h+r*r));
                System.out.printf("Surface area of cone is=%.2f ",area);
                System.out.println();

        }

}
class sphere extends Solid
{
        void getData()
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the radius of sphere");
                r=sc.nextDouble();
        }
        void cal_vol()
        {
                vol=(4*3.14*r*r*r)/3;
                System.out.printf("Volume of sphere is =%.2f",vol);
                System.out.println();

        }
        void cal_area()
        {
                area=4*3.14*r*r;
                System.out.println("Surface area of sphere is= "+area);
        }
}
class solidMain
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter\n1.Cylinder\n2.Cone\n3.Sphere\n4.Exit");
                int choice=sc.nextInt();
                do {
                        switch(choice)
                        {
                        case 1:cylinder cy=new cylinder();
                        cy.getData();
                        cy.cal_area();
                        cy.cal_vol();
                        break;
                        case 2:cone co=new cone();
                        co.getData();
                        co.cal_area();
                        co.cal_vol();
                        break;
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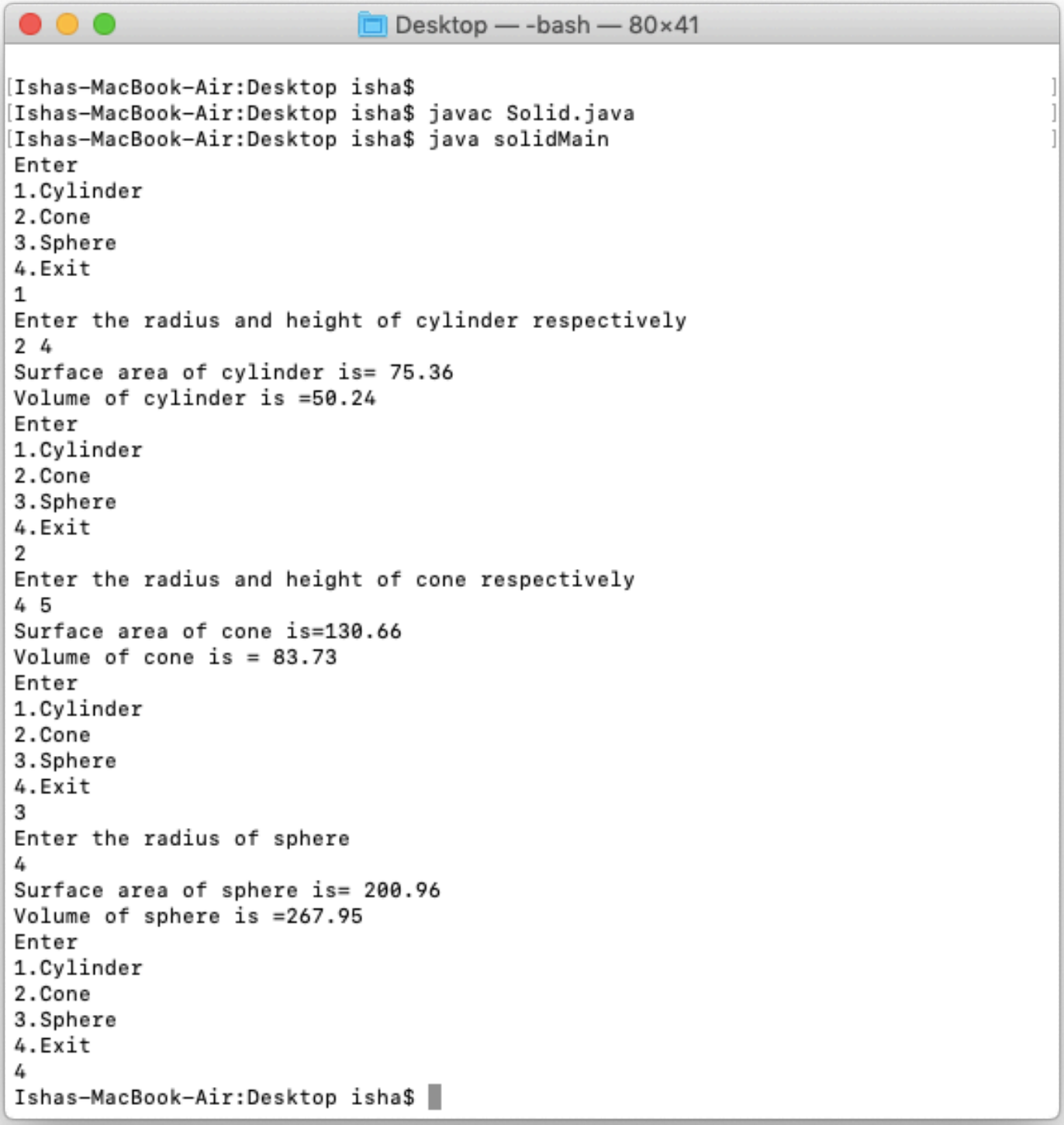
                        case 3:sphere s=new sphere();
                        s.getData();
                        s.cal_area();
                        s.cal_vol();
                        break;
                        default:System.exit(0);
                        }

System.out.println("Enter\n1.Cylinder\n2.Cone\n3.Sphere\n4.Exit");
                    choice=sc.nextInt();

                }while(choice!=4);



        }
}
```


Desktop — -bash — 80×41
[Ishas-MacBook-Air:Desktop isha$
[Ishas-MacBook-Air:Desktop isha$ javac Solid.java
[Ishas-MacBook-Air:Desktop isha$ java solidMain
Enter
1.Cylinder
2.Cone
3.Sphere
4.Exit
1
Enter the radius and height of cylinder respectively
2 4
Surface area of cylinder is= 75.36
Volume of cylinder is =50.24
Enter
1.Cylinder
2.Cone
3.Sphere
4.Exit
2
Enter the radius and height of cone respectively
4 5
Surface area of cone is=130.66
Volume of cone is = 83.73
Enter
1.Cylinder
2.Cone
3.Sphere
4.Exit
3
Enter the radius of sphere
4
Surface area of sphere is= 200.96
Volume of sphere is =267.95
Enter
1.Cylinder
2.Cone
3.Sphere
4.Exit
4
Ishas-MacBook-Air:Desktop isha$