OOP Lab Program 4

4) a) Design, Develop and Implement a Java program to calculate the interest amount based on the rate of interest defined for different banks using the concept of interface. Also calculate and display the maturity amount.

```
publicinterface FixedDeposit {

        double getMAmount();
        void calculateInterest();
        void getDetails();

}


publicclass CanaraBank implements FixedDeposit{

        Scanner s = new Scanner(System.in);
        String name;
        double principal;
        double period;
        double roi = 8.5;
        double interestAmt;

        publicvoid getDetails()
        {
                System.out.println("Enter your name");
                name = s.nextLine();
                System.out.println("Enter the Principal amount");
                principal = s.nextDouble();
                System.out.println("Enter the period of deposit");
                period = s.nextDouble();
        }

        publicvoid calculateInterest() {

                interestAmt = (principal*period*roi)/100;

        }

        publicdouble getMAmount() {

                double totalBalance;
                totalBalance = principal+interestAmt;
                return totalBalance;
        }
```

```
}

publicclass SBI implements FixedDeposit{

	Scanner s = new Scanner(System.in);
	String name;
	double principal;
	double period;
	double roi = 8.75;
	double interestAmt;

	publicvoid getDetails()
	{
		System.out.println("Enter your name");
		name = s.nextLine();
		System.out.println("Enter the Principal amount");
		principal = s.nextDouble();
		System.out.println("Enter the period of deposit");
		period = s.nextDouble();
	}

	publicvoid calculateInterest() {

		interestAmt = (principal*period*roi)/100;

	}

	publicdouble getMAmount() {

		double totalBalance;
		totalBalance = principal+interestAmt;
		return totalBalance;
	}

}
publicclass TestBank {

	publicstaticvoid main(String[] args) {

		double mAmount;
		SBI s = new SBI();
		CanaraBank cb = new CanaraBank();

		s.getDetails();
		s.calculateInterest();
```

```
                mAmount = s.getMAmount();
                System.out.println("Dear "+s.name+" your Maturity Amount in SBI Bank is
"+mAmount);

                cb.getDetails();
                cb.calculateInterest();
                mAmount = cb.getMAmount();
                System.out.println("Dear "+s.name+" your Maturity Amount in Canara Bank is
"+mAmount);

        }

}
```

4) b) Design, Develop and Implement a Java program to compute the surface area and volume of cylinder, cone and sphere. Create an abstract class "Solid" and the classes cylinder, cone and sphere have to inherit the common properties form the class "Solid".

```
publicabstractclass Solid {

        double r, h;
        abstractvoid surfaceArea();
        abstractvoid volume();
        void readRadius()
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the radius");
                r=sc.nextDouble();

        }

        void readHeight()
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the height");
                h=sc.nextDouble();

        }

}


publicclass Cone extends Solid{


        void surfaceArea()
```

```
        {
                double area = (3.14 * r)*(r * Math.sqrt(r*r + h*h));
                System.out.println("Surface area of cone is "+area);
        }


        void volume()
        {
                double volume = 3.14 * r * r * (h/3);
                System.out.println("Volume of cone is "+volume);
        }

}
publicclass Cylinder extends Solid {



        void surfaceArea()
        {
                //System.out.println(r+" "+h);
                double area = 3.14 * r * r * h;
                System.out.println("Surface area of cylinder is " +area);
        }

        void volume()
        {
                double volume = (2 * 3.14 * r * h) + (2 * 3.14 * r * r);
                System.out.println("Volume of cylinder is "+volume);
        }
}


publicclass Sphere extends Solid {


        void surfaceArea()
        {
                double area = 4 * 3.14 * r * r;
                System.out.println("Surface area of sphere is  "+area);
        }

        void volume()
        {
                double volume  = 4.0/3 * 3.14 * r * r * r;
                System.out.println("Volume of sphere is "+volume);
        }
```

```
}


publicclass MySolid {

        publicstaticvoid main(String args[]) {

                Solid s=new Cylinder();
                s.readRadius();
                s.readHeight();
                s.surfaceArea();
                s.volume();

                s=new Cone();
                s.readRadius();
                s.readHeight();
                s.surfaceArea();
                s.volume();

                s=new Sphere();
                s.readRadius();
                s.surfaceArea();
                s.volume();


        }

}
```