AIM:	Understand the concept of method overriding.

Program 1

PROBLEM STATEMENT :

Consider a scenario where Bank is a class that provides functionality to get the rate of interest. However, the rate of interest varies according to banks. For example, SBI, ICICI and AXIS banks are given below.

Period	SBI Interest Rate (Rates in % per annum)
	<Rs. 2 Cr
7–14 Days	3.00
15 –30 Days	3.00
31-45 Days	3.00
46 -90 Days	4.05
91–120 Days	4.10
121-180 Days	4.10

Period	ICICI Interest Rate (Rates in % per annum)
	<Rs. 2 Cr
7–14 Days	3.10
15 –30 Days	3.20
31-45 Days	3.50
46 -90 Days	4.50
91–120 Days	4.70
121-180 Days	4.90

Period	AXIS Interest Rate (Rates in % per annum)
	<Rs. 2 Cr
7–14 Days	3.15
15 –30 Days	3.15
31-45 Days	3.45
46 -90 Days	4.05

91–120 Days 4.70

121-180 Days 5.00

Aayush has deposited Rs. 10000 in SBI Bank, Rs. 12500 in ICICI Bank, and Rs. 20000 in AXIS bank respectively for a particular month.

You need to print the money he will get by applying the rate of interest as per the bank and days.

Create a class 'Bank' with a method 'get_rate_of_interest' which returns 2%.

Make three subclasses named SBI_Bank, 'ICICI_Bank' and 'AXIS_bank' with a method with the same name 'get_rate_of_interest' which returns the rate of interest.

Also, give the final amount Ayush will get from that particular bank by applying the rate of interest and period. Use Calendar Class to count the number of days and amount he will get after maturity with the date of Maturity, if he deposits today.

Note:

1. Use compound interest

2. Get time period from the user

3. Solve using method overriding

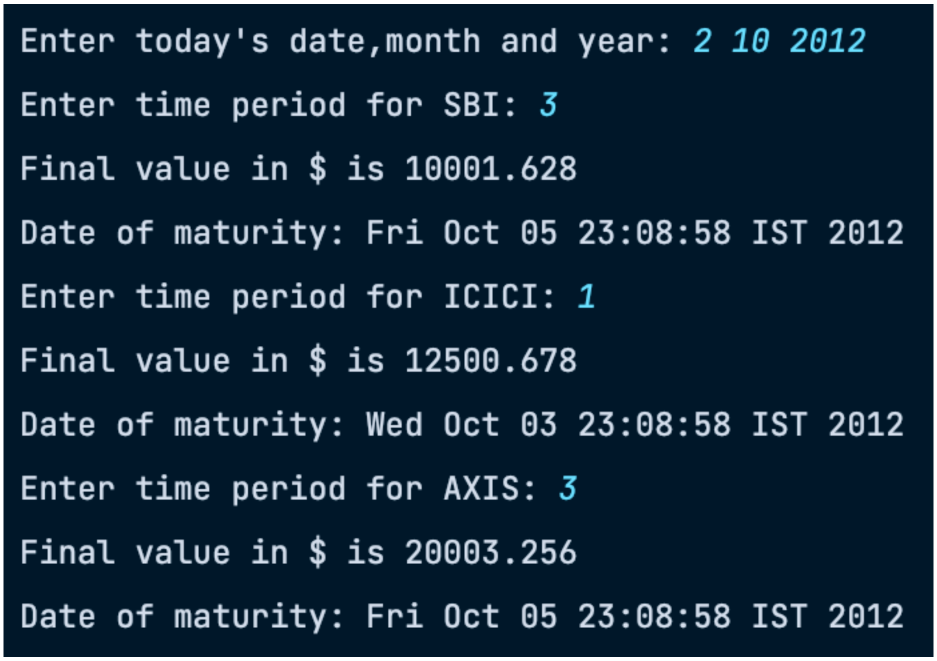
PROGRAM:

```
import java.util.*;
class Bank{
    int get_rate_of_interest(){
        int interest = 2;
        return 2;
    }
}
class SBI_Bank extends Bank{
    double get_rate_of_interest(int t){
        if(t>=7 && t<= 14){
            return 3;
        }
        if(t>=15 && t<= 30){
            return 3;
        }
        if(t>=31 && t<= 45){
            return 3;
        }
        if(t>=46 && t<= 90){
            return 4.05;
        }
        if(t>=91 && t<= 120){
            return 4.10;
        }
        if(t>=121 && t<= 180){
            return 4.10;
        }
        return 2;
}
}
class ICICI_Bank extends Bank{
    double get_rate_of_interest(int t){
        if(t>=7 && t<= 14){
            return 3.1;
        }
        if(t>=15 && t<= 30){
            return 3.2;
        }
        if(t>=31 && t<= 45){
            return 3.5;
        }
        if(t>=46 && t<= 90){
            return 4.5;
        }
        if(t>=91 && t<= 120){
            return 4.7;
        }
        if(t>=121 && t<= 180){
            return 4.9;
        }
        return 2;
}
}
class AXIS_Bank extends Bank{
    double get_rate_of_interest(int t){
        if(t>=7 && t<= 14){
            return 3.15;
        }
        if(t>=15 && t<= 30){
            return 3.15;
        }
        if(t>=31 && t<= 45){
            return 3.45;
        }
        if(t>=46 && t<= 90){
            return 4.05;
        }
        if(t>=91 && t<= 120){
            return 4.70;
        }
        if(t>=121 && t<= 180){
            return 5;
        }
        return 2;
    }
}
public class exp6_1
{
    public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    int t1,t2,t3;
    SBI_Bank sbi = new SBI_Bank();
    ICICI_Bank icici = new ICICI_Bank();
    AXIS_Bank axis = new AXIS_Bank();
    Calendar c1 = Calendar.getInstance();
    Calendar c2 = Calendar.getInstance();
    Calendar c3 = Calendar.getInstance();
    int day ;
    int month;
    int year;
    System.out.print("Enter today's date,month and year: ");
    day = sc.nextInt();
    month = sc.nextInt();
    year = sc.nextInt();
    System.out.print("Enter time period for SBI: ");
    t1=sc.nextInt();
    System.out.println("Final value in $ is
"+(float)(10000*Math.pow((1+(sbi.get_rate_of_interest(t1)/100)),(float)t1/365)));
    System.out.print("Date of maturity: ");
    c1.set(year,month-1,day);
    c1.add(Calendar.DATE, t1);
    System.out.println(c1.getTime());
    System.out.print("Enter time period for ICICI: ");

    t2=sc.nextInt();

    System.out.println("Final value in $ is
"+(float)(12500*Math.pow((1+(icici.get_rate_of_interest(t2)/100)),(float)t2/365)));
    System.out.print("Date of maturity: ");
    c2.set(year,month-1,day);
    c2.add(Calendar.DATE, t2);
    System.out.println(c2.getTime());
    System.out.print("Enter time period for AXIS: ");
    t3=sc.nextInt();
    System.out.println("Final value in $ is
"+(float)(20000*Math.pow((1+(axis.get_rate_of_interest(t3)/100)),(float)t3/365)));
    System.out.print("Date of maturity: ");
    c3.set(year,month-1,day);
    c3.add(Calendar.DATE, t3);
    System.out.println(c3.getTime());
}
}
```

RESULT:



```
Enter today's date,month and year: 2 10 2012
Enter time period for SBI: 3
Final value in $ is 10001.628
Date of maturity: Fri Oct 05 23:08:58 IST 2012
Enter time period for ICICI: 1
Final value in $ is 12500.678
Date of maturity: Wed Oct 03 23:08:58 IST 2012
Enter time period for AXIS: 3
Final value in $ is 20003.256
Date of maturity: Fri Oct 05 23:08:58 IST 2012
```

Program 2

PROBLEM STATEMENT :

Ankit works at ABC Company. He noticed that different roles(positions) have different salaries and bonuses.

The 1st Role is an ‘Intern’ which has 3/4th of the base salary of an Employee.

Then there is ‘Clerk’ which has ½ of base salary.

And then there are ‘Manager’ who have twice the base salary of that of an employee.

Help him write a program in Java as follows.

Create a class ‘Employee’ which has a method named ‘getSalary’ which returns a base salary of Rs. 10,000. It also has methods named ‘getBonus’ which returns the bonus amount for that role(initially set to Rs. 0).

Make 3 subclasses for different roles which inherit the ‘Employee’ class and each has functions named ‘getSalary’ and ‘getBonus’.(You can assume values for ‘getBonus’ method)

Display the output for all cases. Also print the total salary received by each Employee

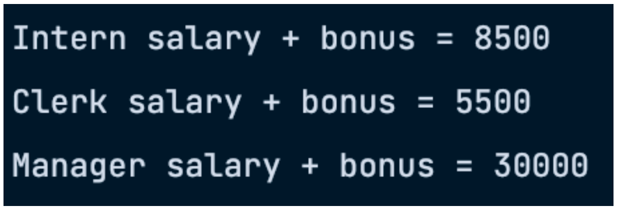
after getting the bonus.

Note : Solve using method overriding

PROGRAM:

```java
class Employee{
    int sal = 10000;
    int getSalary(){
        return 10000;
}
    int getbonus(){
        return 0;
    }
}
class Intern extends Employee{
    int getSalary(){
        return 3*(sal/4);
    }
    int getbonus(){
        return 1000;
    }
}
class clerk extends Employee{
    int getSalary(){
        return (sal/2);
    }
    int getbonus(){
        return 500;
    }
}
class Manager extends Employee{
    int getSalary(){
        return 2*(sal);
    }
    int getbonus(){
        return 10000;
    }
}
public class exp6_2
{
    public static void main(String[] args) {
        Intern i = new Intern();
        clerk c = new clerk();
        Manager m = new Manager();
        System.out.println("Intern salary + bonus = " + (i.getSalary()+i.getbonus()));
        System.out.println("Clerk salary + bonus = " + (c.getSalary()+c.getbonus()));
        System.out.println("Manager salary + bonus = " + (m.getSalary()+m.getbonus()));
    }
}
```

RESULT:



```
Intern salary + bonus = 8500
Clerk salary + bonus = 5500
Manager salary + bonus = 30000
```

Program 3

PROBLEM STATEMENT:

Create a class named ‘Shape’ which has a method ‘getArea’, ‘getPerimeter’ and ‘getSide’ and all of them return 0. Make three subclasses for three different shapes - ‘Circle’, ‘Triangle’ and ‘Pentagon’. These subclasses inherit the ‘Shape’ class and they also have ‘getArea’, ‘getPerimeter’ and ‘getSide’ methods.

Write a program for the above scenario and display the solution.

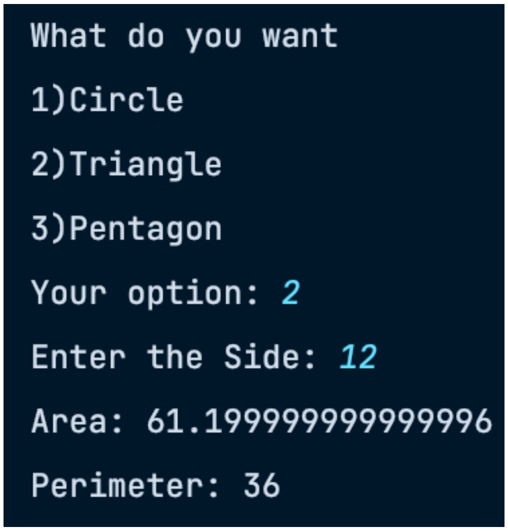
Note: Solve using method overriding

PROGRAM:

```
import java.util.*;
class Shape{
    int side;
    final float PI=3.14f;
    double getArea(){
        return 0;
    }
    int getPerimeter(){
        return 0;
    }
    int getside(){
        return 0;
    }
}
class Circle extends Shape{
    int getside(int n){
        side=n;
        return 0;
    }
    double getArea(){
        return PI*side*side;
    }
    int getPerimeter(){
        return 2*22*side/7;
    }
}
class Triangle extends Shape{
    int getside(int base){
        side=base;
        return 0;
    }
    double getArea(){
        return 1.7*side*side/4;
    }
    int getPerimeter(){
        return 3*side;
    }
}
class Pentagon extends Shape{
    int getside(int base){
        side=base;
        return 0;
    }
    double getArea(){
        return (Math.sqrt(5 * (5 + 2 * (Math.sqrt(5)))) * side * side) / 4;
    }
    int getPerimeter(){
        return 5*side;
    }
}
class Shapesofyou{
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("What do you want ");
        System.out.println("1)Circle\n2)Triangle\n3)Pentagon  ");
        System.out.print("Your option: ");
        int option =sc.nextInt();
        switch(option){
            case 1:
                System.out.print("Enter the Radius: ");
                int side=sc.nextInt();
                Circle c1 =new Circle();
                c1.getside(side);
                System.out.println("Area: " + c1.getArea());
                System.out.println("Perimeter: "+c1.getPerimeter());
                break;
            case 2:
                System.out.print("Enter the Side: ");
                side=sc.nextInt();
                Triangle t1 =new Triangle();
                t1.getside(side);
                System.out.println("Area: " +t1.getArea());
                System.out.println("Perimeter: "+t1.getPerimeter());
                break;
            case 3:
                System.out.print("Enter the side of Pentagon: ");
                side=sc.nextInt();
                Pentagon p1 =new Pentagon();
                p1.getside(side);
                System.out.println("Area: " +p1.getArea());
                System.out.println("Perimeter: "+p1.getPerimeter());
                break;
            default:
                System.out.print("Goli beta masti naiiii!!!!!!!!!!!!! ");

        }
    }
}
```

RESULT:



```
What do you want
1)Circle
2)Triangle
3)Pentagon
Your option: 2
Enter the Side: 12
Area: 61.199999999999996
Perimeter: 36
```

Program 4

PROBLEM STATEMENT:

Imagine a publishing company that markets both book and audiocassette versions of its works. Create a class publication that stores the title (a string) and price (type float) of a publication. From this class derive two classes: book, which adds a page count (type int), and tape, which adds a playing time in minutes (type float). Each of these three classes should have a getdata() function to get its data from the user at the keyboard, and a putdata() function to display its data.

Add a class sales that holds an array of three floats so that it can record the dollar

sales of a particular publication for the last three months. Include a getdata() function to get three sales amounts from the user, and a putdata() function to display the sales figures. Alter the book class so they are derived from both publication and sales. An object of class book should input and output sales data along with its other data. Write a main() function to create a book object and a tape object and exercise their input/output capabilities.

PROGRAM:

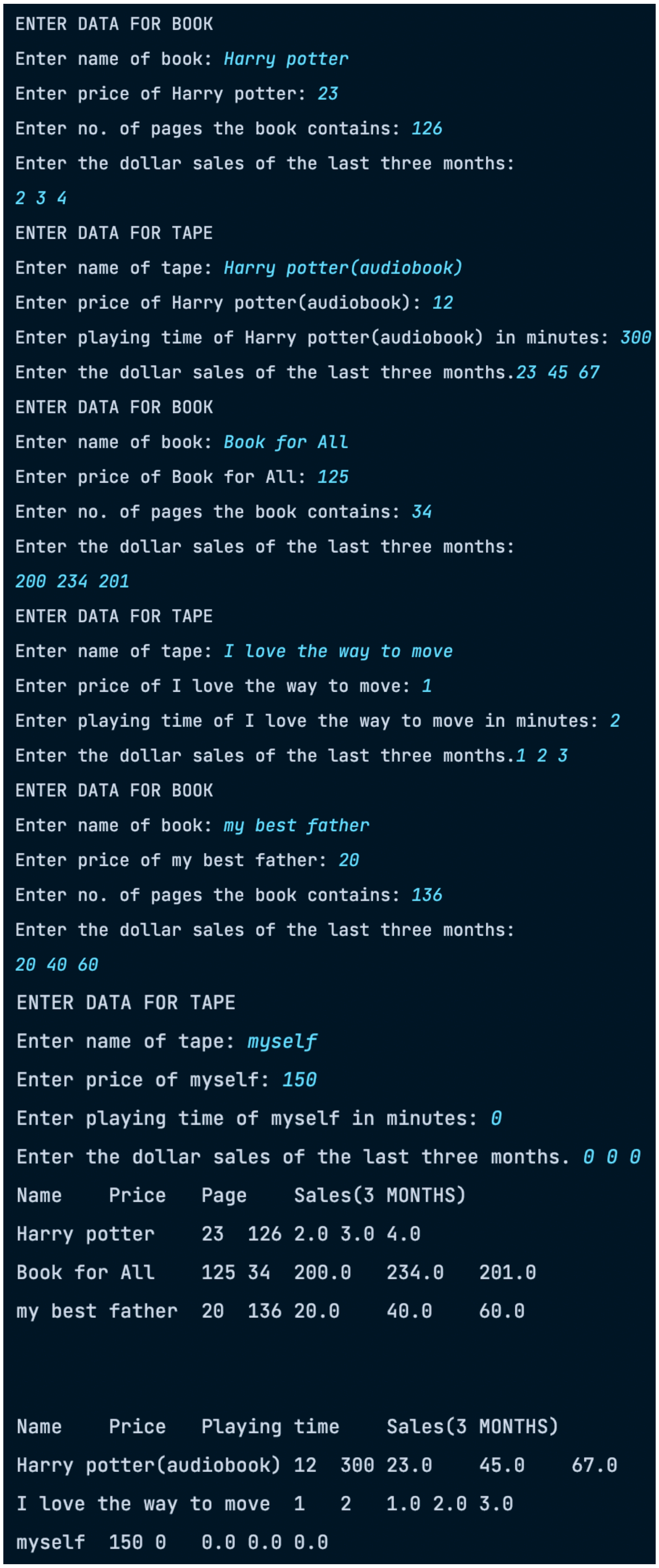
```
import java.util.*;
class sales{
    Scanner sc = new Scanner(System.in);
    float[] sales = new float[3];
    void getdata(){
        System.out.print("Enter the dollar sales of the last three months.");
        for(int i = 0 ; i< 3;i++)
            sales[i]= sc.nextFloat();
    }
    void putdata(){
        System.out.println(sales[0]+"\t"+sales[1]+"\t"+sales[2]+"\t");
    }
}
class publication extends sales {
    int price;
    String name; void getdata(){
        price= sc.nextInt();
        name = sc.nextLine();
    }
    void putdata(){
        System.out.println(name +" "+ price);
    }
}
class book extends publication{
    int page ;
    void getdata(){
    System.out.print("Enter name of book: ");
    name = sc.nextLine();
    System.out.print("Enter price of "+name+": ");
    price= sc.nextInt();
    System.out.print("Enter no. of pages the book contains: ");
    page= sc.nextInt();
    System.out.println("Enter the dollar sales of the last three months: ");
    for(int i = 0 ; i< 3;i++)
        sales[i]= sc.nextFloat();
}
    void putdata(){
        System.out.println(name +"\t"+ price + "\t"+ page
+"\t"+sales[0]+"\t"+sales[1]+"\t"+sales[2]+"\t");
    }
}
class tape extends publication{
    int time;
    void getdata(){
    System.out.print("Enter name of tape: ");
    name = sc.nextLine();
    System.out.print("Enter price of "+name+": ");
    price= sc.nextInt();
    System.out.print("Enter playing time of "+name+" in minutes: ");
    time = sc.nextInt();
    System.out.print("Enter the dollar sales of the last three months.");
    for(int i = 0 ; i< 3;i++)
        sales[i]= sc.nextFloat();
}
    void putdata(){
        System.out.println(name +"\t"+ price + "\t"+
time+"\t"+sales[0]+"\t"+sales[1]+"\t"+sales[2]+"\t");
    }
}

public class Main_class {
    public static void main(String[] args) {
        book[] b = new book[3];
        tape[] t = new tape[3];
        for (int i = 0; i < 3; i++) {
            b[i] = new book();
            t[i] = new tape();
            System.out.println("ENTER DATA FOR BOOK");
            b[i].getdata();
            System.out.println("ENTER DATA FOR TAPE");
            t[i].getdata();
        }
        System.out.println("Name\tPrice\tPage\tSales(3 MONTHS)\t");
        for (int i = 0; i < 3; i++) {
            b[i].putdata();
        }
        System.out.println("\n");
        System.out.println("Name\tPrice\tPlaying time\tSales(3 MONTHS)\t");

        for (int i = 0; i < 3; i++) {
            t[i].putdata();
        }
```

```
   }
}
```

RESULT:



```
ENTER DATA FOR BOOK
Enter name of book: Harry potter
Enter price of Harry potter: 23
Enter no. of pages the book contains: 126
Enter the dollar sales of the last three months:
2 3 4
ENTER DATA FOR TAPE
Enter name of tape: Harry potter(audiobook)
Enter price of Harry potter(audiobook): 12
Enter playing time of Harry potter(audiobook) in minutes: 300
Enter the dollar sales of the last three months.23 45 67
ENTER DATA FOR BOOK
Enter name of book: Book for All
Enter price of Book for All: 125
Enter no. of pages the book contains: 34
Enter the dollar sales of the last three months:
200 234 201
ENTER DATA FOR TAPE
Enter name of tape: I love the way to move
Enter price of I love the way to move: 1
Enter playing time of I love the way to move in minutes: 2
Enter the dollar sales of the last three months.1 2 3
ENTER DATA FOR BOOK
Enter name of book: my best father
Enter price of my best father: 20
Enter no. of pages the book contains: 136
Enter the dollar sales of the last three months:
20 40 60
ENTER DATA FOR TAPE
Enter name of tape: myself
Enter price of myself: 150
Enter playing time of myself in minutes: 0
Enter the dollar sales of the last three months. 0 0 0
Name    Price   Page    Sales(3 MONTHS)
Harry potter    23  126 2.0 3.0 4.0
Book for All    125 34  200.0   234.0   201.0
my best father  20  136 20.0    40.0    60.0



Name    Price   Playing time    Sales(3 MONTHS)
Harry potter(audiobook) 12  300 23.0    45.0    67.0
I love the way to move  1   2   1.0 2.0 3.0
myself  150 0   0.0 0.0 0.0
```

CONCLUSION:	We learnt the concept of method overriding in this experiment as how a child class can Implement the same method present in parent class.