Experiment - 3

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Semester: 5th **Date of Performance: 16/08/2022**
Subject Name: Machine Learning Lab **Subject Code: 20CSP-317**

1. Aim/Overview of the practical:
Create an application to calculate interest for FDs, RDs based on certain conditions using inheritance.

2. Task to be done/ Which logistics used:
Write a program to create an application to make a Account holders list and calculate interest for FDs, RDs based on certain conditions using inheritance.

3. Algorithm/Flowchart **(For programming-based labs):**

4. Steps for experiment/practical/Code:

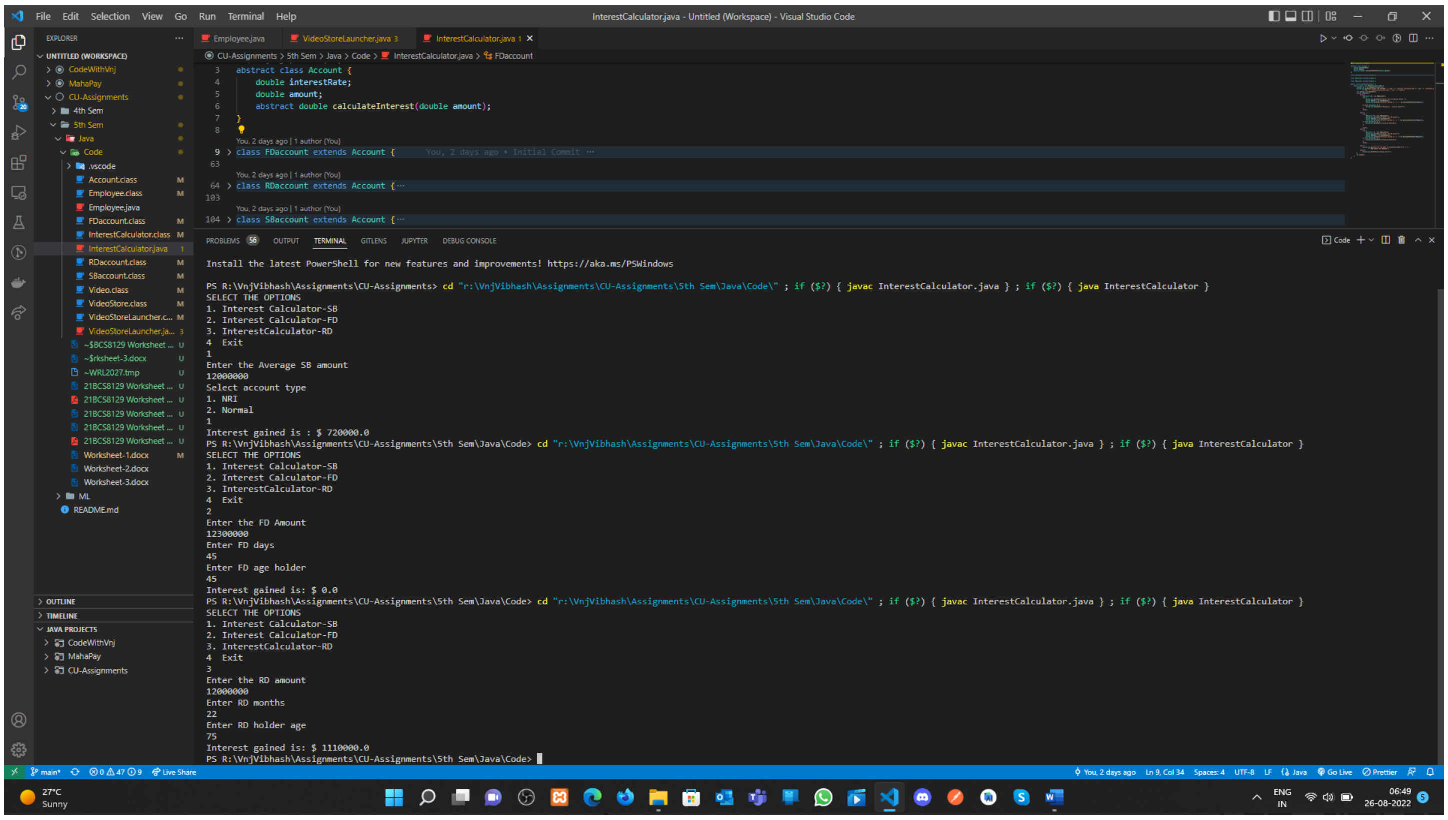
```
import java.util.Scanner;

abstract class Account {
    double interestRate;
    double amount;
    abstract double calculateInterest(double amount);
}

class FDaccount extends Account {
    double FDinterestRate;
    double FDAmount;
    int noOfDays;
    int ageOfACHolder;
    double General, SCitizen;
    Scanner FDScanner = new Scanner(System.in);
```

```
@Override
double calculateInterest(double amount){
    this.FDAmount = amount;
    System.out.println("Enter FD days");
    noOfDays = FDScanner.nextInt();
    System.out.println("Enter FD age holder ");
    ageOfACHolder = FDScanner.nextInt();
    if (amount < 10000000) {
        if (noOfDays >= 7 && noOfDays <= 14) {
            General = 0.0450;
            SCitizen = 0.0500;
        } else if (noOfDays >= 15 && noOfDays <= 29) {
            General = 0.0470;
            SCitizen = 0.0525;
        } else if (noOfDays >= 30 && noOfDays <= 45) {
            General = 0.0550;
            SCitizen = 0.0600;
        } else if (noOfDays >= 45 && noOfDays <= 60) {
            General = 0.0700;
            SCitizen = 0.0750;
        } else if (noOfDays >= 61 && noOfDays <= 184) {
            General = 0.0750;
            SCitizen = 0.0800;
        } else if (noOfDays >= 185 && noOfDays <= 365) {
            General = 0.0800;
            SCitizen = 0.0850;
        }
        FDinterestRate = (ageOfACHolder < 50) ? General : SCitizen;
    } else {
        if (noOfDays >= 7 && noOfDays <= 14) {
            interestRate = 0.065;
        } else if (noOfDays >= 15 && noOfDays <= 29) {
            interestRate = 0.0675;
        } else if (noOfDays >= 30 && noOfDays <= 45) {
                interestRate = 0.00675;
            } else if (noOfDays >= 45 && noOfDays <= 60) {
                interestRate = 0.080;
            } else if (noOfDays >= 61 && noOfDays <= 184) {
                interestRate = 0.0850;
            } else if (noOfDays >= 185 && noOfDays <= 365) {
                interestRate = 0.10;
            }
        }
        return FDAmount * FDinterestRate;
    }
}

class RDaccount extends Account {
    double RDInterestRate;
    double RDamount;
    int noOfMonths;
    double monthlyAmount;
    double General, SCitizen;
    Scanner RDScanner = new Scanner(System.in);

    @Override
    double calculateInterest(double Ramount){
        this.RDamount = Ramount;
        System.out.println("Enter RD months");
        noOfMonths = RDScanner.nextInt();
        System.out.println("Enter RD holder age");
        int age = RDScanner.nextInt();

        if (noOfMonths >= 0 && noOfMonths <= 6) {
            General = .0750;
            SCitizen = 0.080;
        } else if (noOfMonths >= 7 && noOfMonths <= 9) {
            General = .0775;
            SCitizen = 0.0825;
        } else if (noOfMonths >= 10 && noOfMonths <= 12) {
            General = .0800;
            SCitizen = 0.0850;
        } else if (noOfMonths >= 13 && noOfMonths <= 15) {
            General = .0825;
            SCitizen = 0.0875;
        } else if (noOfMonths >= 16 && noOfMonths <= 18) {
            General = .0850;
            SCitizen = 0.0900;
        } else if (noOfMonths >= 22) {
            General = .0875;
            SCitizen = 0.0925;
        }
        RDInterestRate = (age < 50) ? General : SCitizen;
        return RDamount * RDInterestRate;
    }
}

class SBaccount extends Account {
    double SBamount , SbInterestRate, interest;
    Scanner SBScanner = new Scanner(System.in);

    @Override
    double calculateInterest(double amount){
        this.SBamount = amount;
        System.out.println("Select account type \n1. NRI \n2. Normal ");
        int accountChoice = SBScanner.nextInt();
        switch (accountChoice) {
            case 1:
                SbInterestRate = .06;
                break;
            case 2:
                SbInterestRate = .04;
                break;
            default:
                System.out.println("Please choose right account again");
        }
    return amount * SbInterestRate;
  }
}

public class InterestCalculator {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("SELECT THE OPTIONS " + "\n1." + " Interest Calculator-SB" + "
\n2." + " Interest Calculator-FD"
                + "\n3." + " InterestCalculator-RD" + "\n4 " + " Exit");
        int choice = sc.nextInt();
        switch (choice) {
            case 1:
                SBaccount sb = new SBaccount();
                try {
                    System.out.println("Enter the Average SB amount ");
                    double amount = sc.nextDouble();
                    System.out.println("Interest gained is : $ " + sb.calculateInterest(amount));

                } catch (Exception e) {
                    System.out.println("Exception : Invalid amount");
                }
                break;

            case 2:
                try {
                    FDaccount fd = new FDaccount();
                    System.out.println("Enter the FD Amount");
                    double fAmount = sc.nextDouble();
                    System.out.println("Interest gained is: $ " + fd.calculateInterest(fAmount));
                } catch (Exception e) {
                    System.out.println("Invalid Entered");
                }

                break;
            case 3:
                try {
                    RDaccount rd = new RDaccount();
                    System.out.println("Enter the RD amount");
                    double Ramount = sc.nextDouble();
                    System.out.println("Interest gained is: $ " + rd.calculateInterest(Ramount));
                } catch (Exception e) {
                    System.out.println("Invalid Entered");
                }
                break;

            case 4:
                System.out.println("DO YOU WANT TO CALCULATE AGAIN ????" + " "
                        + "RUN AGAIN THE PROGRAM");
            default:
                System.out.println("Wrong choice");
        }
        sc.close();
    }
}
```

5. Observations/Discussions/ Complexity Analysis:

Based on the questions here I have created the abstract class named as Account, and then FDaccount, RDaccount and SBaccount class which extends the Account class and then Final class I have created the IntrestCalculator which contains the main method of java program that is based on the question.

6. Result/Output/Writing Summary:



```
abstract class Account {
    double interestRate;
    double amount;
    abstract double calculateInterest(double amount);
}

class FDaccount extends Account {

class RDaccount extends Account {⋯

class SBaccount extends Account {⋯
```

```
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS R:\VnjVibhash\Assignments\CU-Assignments> cd "r:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code\" ; if ($?) { javac InterestCalculator.java } ; if ($?) { java InterestCalculator }
SELECT THE OPTIONS
1. Interest Calculator-SB
2. Interest Calculator-FD
3. InterestCalculator-RD
4  Exit
1
Enter the Average SB amount
12000000
Select account type
1. NRI
2. Normal
1
Interest gained is : $ 720000.0
PS R:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code> cd "r:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code\" ; if ($?) { javac InterestCalculator.java } ; if ($?) { java InterestCalculator }
SELECT THE OPTIONS
1. Interest Calculator-SB
2. Interest Calculator-FD
3. InterestCalculator-RD
4  Exit
2
Enter the FD Amount
12300000
Enter FD days
45
Enter FD age holder
45
Interest gained is: $ 0.0
PS R:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code> cd "r:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code\" ; if ($?) { javac InterestCalculator.java } ; if ($?) { java InterestCalculator }
SELECT THE OPTIONS
1. Interest Calculator-SB
2. Interest Calculator-FD
3. InterestCalculator-RD
4  Exit
3
Enter the RD amount
12000000
Enter RD months
22
Enter RD holder age
75
Interest gained is: $ 1110000.0
PS R:\VnjVibhash\Assignments\CU-Assignments\5th Sem\Java\Code>
```

Learning outcomes (What I have learnt):

1. Here we have learnt the Concept of Inheritance with the Abstract class

2. And finding the Interest based on the Amount and Age group.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			