Experiment 3

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Branch: CSE Section/Group: 806/B
Semester: 5th Sem Date of Performance: 30 Aug,2022
Subject Name: PBL in Java Lab Subject Code: 20CSP-321

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:

Calculate interest based on the type of the account and the status of the account holder. The rates of interest changes according to the amount (greater than or less than 1 crore), age of account holder (General or Senior citizen) and number of days if the type of account is FD or RD.

3. Source Code:

```
import java.util.Scanner;

public class InterestCalculator {

public static void main(String[] args) {

        Scanner  sc = new Scanner(System.in);
System.out.println("SANSKAR AGRAWAL 20BCS5914");
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 : Rs " + sb.calculateInterest(amount));

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

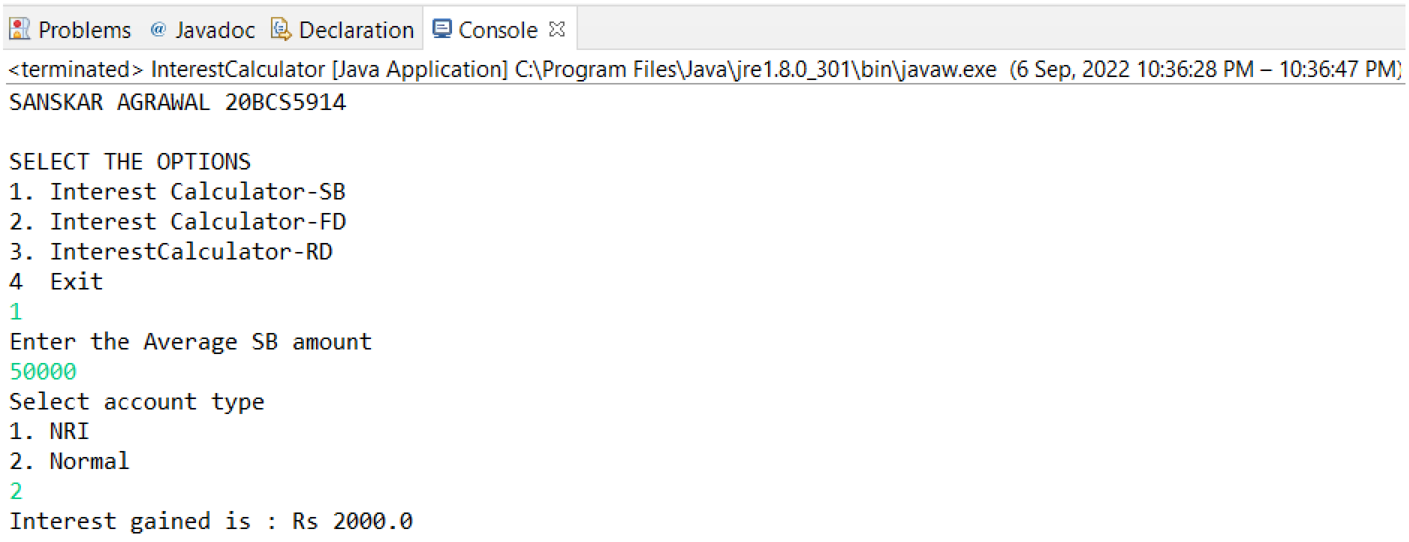
```
                }
break;

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

                } catch (InvalidDaysException e) {
System.out.println("Invalid Days 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: Rs " + rd.calculateInterest(Ramount));
                }
catch (InvalidAgeException e) {
System.out.println("Invalid Age Entered");
                } catch (InvalidAmountException e) {
System.out.println("Invalid Amount Entered");

                } catch (InvalidMonthsException e) {
System.out.println("Invalid Days 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();
```

```
    }

}

abstract class Account {
double interestRate;
double amount;
abstract double calculateInterest(double amount)throws InvalidMonthsException , InvalidAgeException ,
InvalidAmountException  ,InvalidDaysException;
}

class FDaccount extends Account {

double FDinterestRate;
double FDAmount;
int noOfDays;
int ageOfACHolder;
double General, SCitizen;
    Scanner FDScanner = new Scanner(System.in);

double calculateInterest(double amount) throws
InvalidAgeException,InvalidAmountException,InvalidDaysException {
this.FDAmount = amount;

System.out.println("Enter FD days");
noOfDays = FDScanner.nextInt();
System.out.println("Enter FD age holder ");
ageOfACHolder = FDScanner.nextInt();
if (amount< 0) {
throw new InvalidAmountException();
        }
if(noOfDays<0){
throw new InvalidDaysException();
        }
if(ageOfACHolder<0){
throw new InvalidAgeException();
        }
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 InvalidAgeException extends Exception{}

class InvalidAmountException extends Exception{}

class InvalidDaysException extends Exception{}

class InvalidMonthsException extends Exception{}

class RDaccount extends  Account {

double RDInterestRate;
double RDamount;
int noOfMonths;
double monthlyAmount;
double General, SCitizen;
```

```
    Scanner RDScanner = new Scanner(System.in);


double calculateInterest(double Ramount) throws InvalidMonthsException,InvalidAmountException
,InvalidAgeException {
this.RDamount = Ramount;
System.out.println("Enter RD months");
noOfMonths = RDScanner.nextInt();
System.out.println("Enter RD holder age");
int age = RDScanner.nextInt();
if (RDamount< 0) {
throw new InvalidAmountException();
        }
if(noOfMonths<0){
throw new InvalidMonthsException();
        }
if(age<0){
throw new InvalidAgeException();
        }
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);


double calculateInterest(double amount) throws InvalidAmountException{
this.SBamount = amount;
if(SBamount< 0 ){
throw new InvalidAmountException();
        }
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;
}}
```

4. Result/Output:



```
<terminated> InterestCalculator [Java Application] C:\Program Files\Java\jre1.8.0_301\bin\javaw.exe  (6 Sep, 2022 10:36:28 PM – 10:36:47 PM)
SANSKAR AGRAWAL 20BCS5914

SELECT THE OPTIONS
1. Interest Calculator-SB
2. Interest Calculator-FD
3. InterestCalculator-RD
4  Exit
1
Enter the Average SB amount
50000
Select account type
1. NRI
2. Normal
2
Interest gained is : Rs 2000.0
```

Learning outcomes (What I have learnt):

1. Familiar with Environment
2. Basic functions to perform on array and linked list
3. Uses of abstract class and inheritance
4. Uses of switch case

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment) objectives/Outcomes.		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Total		30