CHANDIGARH UNIVERSITY

UNIVERSITY INSTITUTE OF NGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Submitted By:	**Submitted To:**
Subject Name	
Subject Code	
Branch	
Semester	

LABINDEX

NAME: SANSKAR AGRAWAL UID:20BCS5914

SUBJECT: PROJECT BASED LEARNING JAVA LAB

SUBJECTCODE:20CSP-321

SECTION: 806/B

Sr. No	**Program**	**Date**	**Evaluation**				**Sign**
			LW (12)	**VV (10)**	**FW (8)**	**Total (30)**	

Experiment 3

Student Name: SANSKAR AGRAWAL UID: 20BCS5914
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:

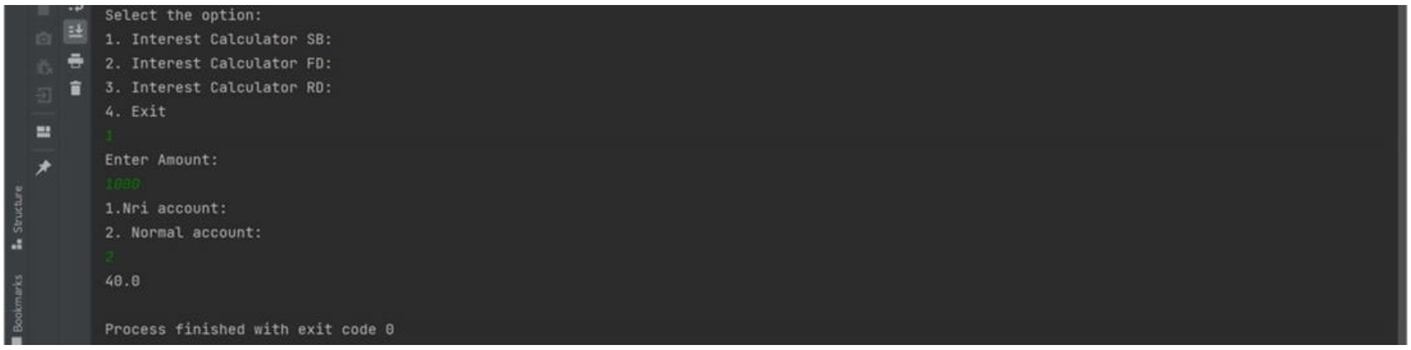
Calculate interest based on the type of the account and the status of the account holder. The rates of interest changes according to the amount (greater than or less than 1 crore), age of account holder (General or Senior citizen) and number of days if the type of account is FD or RD.

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();
```

4. Result/Output:



```
Select the option:
1. Interest Calculator SB:
2. Interest Calculator FD:
3. Interest Calculator RD:
4. Exit
1
Enter Amount:
1000
1.Nri account:
2. Normal account:
2
40.0

Process finished with exit code 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