Experiment 3

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Section/Group: 22BET_IOT-701/A
Semester: 6th
Date of Performance: 25/01/25
Subject Name: PBLJ Lab
Subject Code: 22ITH-359

1. **Aim:** Create an application to calculate interest for FDs, RDs based on certain conditions using inheritance.
2. **Objective:** The goal of this project is to design and implement a simple interest calculator for FDs, RDs. Define least three classes.
3. **Implementation/Code:**

```
import java.util.Scanner;

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

class SBAccount extends Account {
    SBAccount(double amount, String type) {
        this.amount = amount;
        this.interestRate = type.equalsIgnoreCase("NRI") ? 6 : 4;
    }
    @Override
    double calculateInterest() {
```

```
        return (amount * interestRate) / 100;
    }
}

class FDAccount extends Account {
    int noOfDays;
    int ageOfACHolder;

    FDAccount(double amount, int noOfDays, int ageOfACHolder) {
        this.amount = amount;
        this.noOfDays = noOfDays;
        this.ageOfACHolder = ageOfACHolder;
    }

    @Override
    double calculateInterest() {
        double[][] rates = {{4.50, 5.00}, {4.75, 5.25}, {5.50, 6.00}, {7.00, 7.50},
{7.50, 8.00}, {8.00, 8.50}};
        int[] daysRange = {14, 29, 45, 60, 184, 365};
        double rate = 0;
        for (int i = 0; i < daysRange.length; i++) {
            if (noOfDays <= daysRange[i]) {
                rate = ageOfACHolder >= 60 ? rates[i][1] : rates[i][0];
                break;
            }
        }
        return (amount * rate) / 100;
```

```
    }
}

class RDAccount extends Account {
    int noOfMonths;
    double monthlyAmount;

    RDAccount(double monthlyAmount, int noOfMonths, int ageOfACHolder) {
        this.monthlyAmount = monthlyAmount;
        this.noOfMonths = noOfMonths;
        this.interestRate = ageOfACHolder >= 60 ? 8.0 + (noOfMonths / 6) * 0.5 :
7.5 + (noOfMonths / 6) * 0.5;
    }

    @Override
    double calculateInterest() {
        return (monthlyAmount * noOfMonths * interestRate) / 100;
    }
}

public class InterestCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        while (true) {
            System.out.println("Select the option:");
            System.out.println("1. Interest Calculator - SB");
            System.out.println("2. Interest Calculator - FD");
```

```
            System.out.println("3. Interest Calculator - RD");
            System.out.println("4. Exit");
            int choice = scanner.nextInt();
            switch (choice) {
                case 1:
                    System.out.print("Enter the Average amount in your account: ");
                    double sbAmount = scanner.nextDouble();
                    System.out.print("Enter account type (Normal/NRI): ");
                    String type = scanner.next();
                    SBAccount sbAccount = new SBAccount(sbAmount, type);
                    System.out.println("Interest gained: Rs. " +
sbAccount.calculateInterest());
                    break;
                case 2:
                    System.out.print("Enter the FD amount: ");
                    double fdAmount = scanner.nextDouble();
                    System.out.print("Enter the number of days: ");
                    int days = scanner.nextInt();
                    System.out.print("Enter your age: ");
                    int age = scanner.nextInt();
                    if (days < 0) {
                        System.out.println("Invalid Number of days. Please enter correct
values.");
                        break;
                    }
                    FDAccount fdAccount = new FDAccount(fdAmount, days, age);
```

```
                System.out.println("Interest gained: Rs. " +
fdAccount.calculateInterest());
                break;
            case 3:
                System.out.print("Enter the monthly deposit amount: ");
                double rdAmount = scanner.nextDouble();
                System.out.print("Enter the number of months: ");
                int months = scanner.nextInt();
                System.out.print("Enter your age: ");
                age = scanner.nextInt();
                RDAccount rdAccount = new RDAccount(rdAmount, months, age);
                System.out.println("Interest gained: Rs. " +
rdAccount.calculateInterest());
                break;
            case 4:
                System.exit(0);
            default:
                System.out.println("Invalid option. Try again.");
        }
    }
}
```

4. Output

```
Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
2
Enter the FD amount: 4000
Enter the number of days: 200
Enter your age: 22
Interest gained: Rs. 320.0
Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
3
Enter the monthly deposit amount: 5000
Enter the number of months: 13
Enter your age: 22
Interest gained: Rs. 5525.0
Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
4
```

5. Learning Outcome

a. Concepts of array in java.

b. Use of Override.

c. Use of abstract class and methods

d. Method overloading and method overriding in java.