Experiment 3

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1. **Aim:** Create an application to calculate interest for FDs, RDs based on certain conditions using inheritance.

2. **Objective:** 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. **Implementation/Code:**

```
package Java;
import java.util.Scanner;
abstract class Account {
double amount;
abstract double calculateInterest();
}
class SBAccount extends
Account {
SBAccount(double amount) {
this.amount = amount; }
double calculateInterest() {
return amount * 0.04;
}
}
class FDAccount extends
Account {     int days, age;
```

```
FDAccount(double amount, int days, int
age) {
this.amount = amount;
this.days = days;
this.age = age;
}
 double calculateInterest()
{
 if (days < 7) {
 System.out.println("Invalid Number of days. Please enter correct values.");
return 0;
}

 boolean aboveOneCr = amount >= 1_00_00_000;  //

 if (days >= 7 && days <= 14) rate = aboveOneCr ? (age <
60 ? 0.045 : 0.05) : (age < 60 ? 0.04 : 0.045);
else if (days >= 15 && days <= 29) rate = aboveOneCr ? (age < 60 ? 0.0475 : 0.0525) :
(age < 60 ? 0.0425 : 0.0475);
else if (days >= 30 && days <= 45) rate = aboveOneCr ? (age < 60 ? 0.055 : 0.06) : (age
< 60 ? 0.05 : 0.055);
else if (days >= 46 && days <= 60) rate = aboveOneCr ? (age < 60 ? 0.07 : 0.075) : (age
< 60 ? 0.065 : 0.07);
 else if (days >= 61 && days <= 90) rate = aboveOneCr ? (age < 60 ? 0.075 : 0.08) (age
< 60 ? 0.07 : 0.075);
else if (days >= 91 && days <= 180) rate = aboveOneCr ? (age < 60 ? 0.08 : 0.085) : (age
< 60 ? 0.075 : 0.08);
else rate = aboveOneCr ? (age < 60 ? 0.085 : 0.09) : (age < 60 ? 0.08 : 0.085);
return amount * rate;
 }
}
class RDAccount extends Account {
int months;
RDAccount(double amount, int months) {
this.amount = amount;
this.months = months; }
```

```
double calculateInterest() {
if (months <= 0) {
System.out.println("Invalid Number of months. Please enter correct values.");
return 0;
 }
 boolean aboveOneCr = amount >= 1_00_00_000;
double rate = aboveOneCr ? 0.075 : 0.07;  // 7.5% for >= 1Cr, 7% for < 1Cr
  return amount * rate;
  }
}

public class exp3 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
while (true) {
  System.out.println("\nSelect 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");
  System.out.print("Enter your choice: ");
  int      choice = sc.nextInt();
if (choice == 4) break;
System.out.print("Enter the present amount in your accunt: ");
double amount = sc.nextDouble();
if (choice == 1) {  // SB Account
System.out.println("Interest gained: Rs. " + new
SBAccount(amount).calculateInterest());
}
else if (choice == 2) {  // FD Account
System.out.print("Enter duration in days: ");
int days = sc.nextInt();
if (days <= 0) {
System.out.println("Invalid Number of days. Please enter correct values.");
continue;
```

```
}
System.out.print("Enter age: ");
int age = sc.nextInt();
System.out.println("Interest gained: Rs. " + new FDAccount(amount, days,
age).calculateInterest());
 }
 else if (choice == 3) {  // RD Account
 System.out.print("Enter duration in months: ");
int months = sc.nextInt();
 if (months <= 0) {
 System.out.println("Invalid Number of months. Please enter correct values.");
continue;
 }
System.out.println("Interest gained: Rs. " + new RDAccount(amount,
months).calculateInterest());
} else {
System.out.println("Invalid choice. Please try again.");
 }        }
 sc.close();  }}
```

4. **Output**

```
Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
Enter your choice: 1
Enter the present amount in your accunt: 10000
Interest gained: Rs. 400.0

Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
Enter your choice: 2
Enter the present amount in your accunt: 10000
Enter duration in days: 70
Enter age: 21
Interest gained: Rs. 700.0000000000001

Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
Enter your choice: 3
Enter the present amount in your accunt: 10000
Enter duration in months: 8
Interest gained: Rs. 700.0000000000001

Select the option:
1. Interest Calculator - SB
2. Interest Calculator - FD
3. Interest Calculator - RD
4. Exit
Enter your choice: 4
```

5. Learning Outcome

a) Learned to use abstract classes to define a common interface for subclasses (Account as the base class).
b) Learned how to override abstract methods (calculateInterest) in subclasses (SBAccount, FDAccount, RDAccount) to provide account-specific implementations.Learned how to manage a collection of objects (video inventory) using arrays.
c) Understood how to use conditional statements to determine the appropriate interest rates based on factors like Account, Tenure, Account Holder Age.
d) Gained insights into building applications with real-world relevance, such as an interest calculator for different bank accounts