Experiment No:1.3

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Subject Name: JAVA LAB **Subject Code: 21CSH-319**

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

- **Objective:**
- To learn about concept of Inheritance.
- To learn about Abstract classes, Exception Handling.

- **Input/Apparatus Used:**

- Hardware Requirements: - Minimum 384MB RAM, 100 GB hard Disk, processor with 2.1 MHz
- Software Requirements: - Eclipse, NetBeans, IntelliJ, etc.

- **Procedure/Algorithm/Pseudocode:**

1. Create main java class to take input from user by three classes:
- SBAccount
- FDAccount
- RDAccount

2. Implement cases for three choices:

1. FD 2. RD 3. SB

3. Raise user defined Exception if input has invalid or negative values.

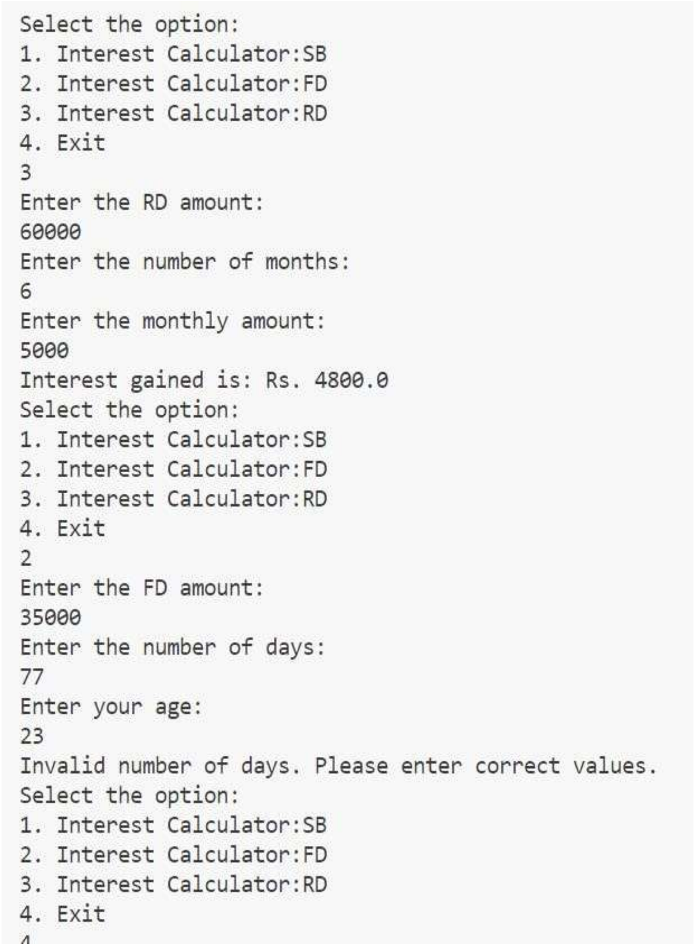
4. Exit.

- **Code:**

```
import java.util.Scanner;

abstract class Account {
    double    interestRate;
    double amount;

    abstract double calculateInterest();
}

class FDAccount extends Account
    {    int    noOfDays;    int
    ageOfAccountHolder;

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

    @Override
    double calculateInterest() {
        if (noOfDays < 0 || amount < 0 || ageOfAccountHolder < 0) {
            throw new IllegalArgumentException("Invalid input. Please enter positive values.");
        }

        if (amount <= 10000000) { // Below 1 Crore
            if (7 <= noOfDays && noOfDays <= 14) { return
                amount * (interestRate / 100);
            } else { throw new IllegalArgumentException("Invalid number of days. Please
                enter
correct values.");
            }
        } else { // Above 1 Crore if (7 <= noOfDays
            && noOfDays <= 14) { return amount *
            (interestRate / 100);
            } else { throw new IllegalArgumentException("Invalid number of days. Please
                enter
correct values.");
            }
        }
    }
}
class SBAccount extends Account
    { SBAccount(double interestRate, double amount) {
        this.interestRate  =  interestRate;  this.amount  =
        amount;
    }

    @Override
    double calculateInterest()
       { if (amount < 0) { throw new IllegalArgumentException("Invalid input. Please enter a
          positive value.");
       }
       return amount * (interestRate / 100);
    }
}

class RDAccount extends Account
    {      int      noOfMonths;
    double monthlyAmount;

    RDAccount(double    interestRate,    double    amount,    int    noOfMonths,    double
monthlyAmount) {
        this.interestRate       =       interestRate;
        this.amount = amount; this.noOfMonths
        = noOfMonths;  this.monthlyAmount  =
        monthlyAmount;
    }

    @Override
    double calculateInterest() {
       if (amount < 0 || noOfMonths < 0 || monthlyAmount < 0) {
          throw new IllegalArgumentException("Invalid input. Please enter positive values.");
       }
       return amount * (interestRate / 100);
    }
}

public class Main {
    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();

        if (choice == 4) {
        break; }

        switch (choice)
           { case 1:
              System.out.println("Enter the Average amount in your account:"); double
              sbAmount = scanner.nextDouble();
              SBAccount sbAccount = new SBAccount(4, sbAmount);
              double sbInterest = sbAccount.calculateInterest();
              System.out.println("Interest gained: Rs. " + sbInterest);
              break;

           case 2:
              System.out.println("Enter the FD amount:");
              double fdAmount = scanner.nextDouble();
              System.out.println("Enter the number of days:");
              int fdDays = scanner.nextInt();
              System.out.println("Enter your age:"); int fdAge
              = scanner.nextInt();
              FDAccount fdAccount = new FDAccount(8, fdAmount, fdDays, fdAge); try
              {
                 double fdInterest = fdAccount.calculateInterest();
                 System.out.println("Interest gained is: Rs. " + fdInterest);
              } catch (IllegalArgumentException e)
                 { System.out.println(e.getMessage());
              }
              break;

           case 3:
              System.out.println("Enter the RD amount:");
              double rdAmount = scanner.nextDouble();
              System.out.println("Enter the number of months:");
              int rdMonths = scanner.nextInt();
              System.out.println("Enter the monthly amount:");
              double rdMonthlyAmount = scanner.nextDouble();
              RDAccount rdAccount = new RDAccount(8, rdAmount, rdMonths,
rdMonthlyAmount);
              try {
                 double rdInterest = rdAccount.calculateInterest();
                 System.out.println("Interest gained is: Rs. " + rdInterest);
              } catch (IllegalArgumentException e)
                 { System.out.println(e.getMessage());
```

```
                    }
                    break;
                    default
                    :
                    System.out.println("Invalid choice. Please enter a valid option.");
                }
            }

            scanner.close();
        }
    }
```

Result/Output:



```
Select the option:
1. Interest Calculator:SB
2. Interest Calculator:FD
3. Interest Calculator:RD
4. Exit
3
Enter the RD amount:
60000
Enter the number of months:
6
Enter the monthly amount:
5000
Interest gained is: Rs. 4800.0
Select the option:
1. Interest Calculator:SB
2. Interest Calculator:FD
3. Interest Calculator:RD
4. Exit
2
Enter the FD amount:
35000
Enter the number of days:
77
Enter your age:
23
Invalid number of days. Please enter correct values.
Select the option:
1. Interest Calculator:SB
2. Interest Calculator:FD
3. Interest Calculator:RD
4. Exit
4
```