1. Define a class to represent a bank account. Include the following members:

```
 import java.io.*; import java.util.*; import java.util.Scanner; import
java.util.Random;  class Bank {     public String nameOfDepositor;
public int accNumber;     public String accType;     public double
balanceAmount;     public void assignValues(String nameOfDepositor, String
accType, double balanceAmount) {
this.nameOfDepositor=nameOfDepositor;         this.accType=accType;
        this.balanceAmount=balanceAmount;
Random random = new Random();
this.accNumber=random.nextInt(1000000);
        System.out.println("Your new account number is: "+accNumber);
    }     public void depositAmount(double
amount) {         if(accNumber==0) {
            System.out.println("!You don't have bank account to
deposit\nNote:create a account First");
        }
else {
            balanceAmount+=amount;
System.out.println("Amount deposited successfully...");
        }
}
    public void withdrawAmount(double amount) {
if(accNumber==0) {
            System.out.println("!You don't have bank account to
credit\nNote:create a account First");
        }         else
if(balanceAmount>amount) {
balanceAmount-=amount;
            System.out.println("Amount credited successfully...");
        }
else {
            System.out.println("! Insufficient balance");
        }     }     public void
displayDetails() {
if(accNumber==0) {
            System.out.println("!You don't have bank account\nNote:create a
account First");
        }
else {
            System.out.println("Name of the Depositor: "+nameOfDepositor);
            System.out.println("Balance amount in the account:
"+balanceAmount);
        }
}
    public void getInput() {
        System.out.println("1. Open account");
        System.out.println("2. Deposit amount");
```

```
        System.out.println("3. Withdraw amount");
        System.out.println("4. Account details");
        System.out.println("5. Exit");
        System.out.print("Please Enter Your choise : ");
    } } class
prog_1 {
    public static void main(String[] s) throws IOException {
        System.out.println("----- WELCOME TO STATE BANK OF INDIA -----");
        Bank newAccount=new Bank();
Scanner scan=new Scanner(System.in);
boolean process=true;         int
continueState=0;
while(continueState!=5) {
newAccount.getInput();             int
currentProcess=scan.nextInt();
if(currentProcess==1) {
                System.out.println("----------------------------------------
-
-------------");
                System.out.print("Enter your name: ");
                String nameOfDepositor=scan.next();
                System.out.print("Enter your account type: ");
                String accType=scan.next();
                System.out.print("Enter your opening balance:
");                 double balanceAmount=scan.nextDouble();
newAccount.assignValues(nameOfDepositor, accType,
balanceAmount);             }
            else if(currentProcess==2) {
                System.out.println("----------------------------------------
-
-------------");
                System.out.print("Enter amount to deposit: ");
newAccount.depositAmount(scan.nextDouble());
            }
            else if(currentProcess==3) {
                System.out.println("----------------------------------------
-
-------------");
                System.out.println("Your current Balance :
"+newAccount.balanceAmount);
                System.out.print("Enter amount to withdraw: ");
newAccount.withdrawAmount(scan.nextDouble());
            }
            else if(currentProcess==4) {
                System.out.println("----------------------------------------
-
-------------");
newAccount.displayDetails();
            }
```

```
            else if(currentProcess==5) {
                System.out.println("----------------------------------------
-
-------------");
                continueState=5;
                System.out.println("THANK YOU FOR CHOOSING US.");
            }
        }
        System.out.println("------------------------------------------------
-
-----");
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_01.java

E:\Java\JOURNAL-2>java PRG_01
:::::::::::: WELCOME TO BANK OF BARODA ::::::::::::
How can i help you?
1. Open account
2. Deposit amount
3. Withdraw amount
4. Account details
5. Exit
Please Enter Your choose : 1
**********************************************************
Enter your name: piyush
Enter your account type: saving
Enter your opening balance: 500
Your new account number is: 3486

X X X X X X X X X X X X X X X X X X X X X X X X X X X X X

How can i help you?
1. Open account
2. Deposit amount
3. Withdraw amount
4. Account details
5. Exit
Please Enter Your choose : 2
**********************************************************
Enter amount to deposit: 10000
Amount deposited successfully...

X X X X X X X X X X X X X X X X X X X X X X X X X X X X X
```

```
How can i help you?
1. Open account
2. Deposit amount
3. Withdraw amount
4. Account details
5. Exit
Please Enter Your choose : 3
*****************************************************
Your current Balance in the account: 10500.0
Enter amount to withdraw: 5000
Amount credited successfully...

X X X X X X X X X X X X X X X X X X X X X X X X X X X

How can i help you?
1. Open account
2. Deposit amount
3. Withdraw amount
4. Account details
5. Exit
Please Enter Your choose : 4
*****************************************************
Name of the Depositor: piyush
Balance amount in the account: 5500.0

X X X X X X X X X X X X X X X X X X X X X X X X X X X

How can i help you?
1. Open account
2. Deposit amount
3. Withdraw amount
4. Account details
5. Exit
Please Enter Your choose : 5
*****************************************************
THANK YOU FOR VISITING OUR BANK.

X X X X X X X X X X X X X X X X X X X X X X X X X X X


------------------------------------------------------------------------
```

2. Write a program to print Floyd's triangle where n is command line input. 1
2 3
4 5 6
7 8 9 10

```
class prog_2 {     static void
printFloydTriangle(int n) {         int i,
j, val = 1;          for (i = 1; i <= n;
i++) {              for (j = 1; j <= i; j++)
{                  System.out.print(val + "
");                  val++;
            }
        System.out.println();
    }
}
public static void main(String[] args) {
int i= Integer.parseInt(args[0]);
printFloydTriangle(i);
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_02.java

E:\Java\JOURNAL-2>java PRG_02 5
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15

E:\Java\JOURNAL-2>
```

3. Design a class Cricketer having data member name and a number of matches and appropriate member function to set the values. Derived two classes Batsman and Bowler from cricketer class with data member total number of runs and wickets respectively. Batsman class is having method to calculate average wicket. Write a program to create two objects and display information of one batsman and bowler along with average run and wicket.

```
import
java.util.Scanner; class
Cricketer {     public
String cname;     public
int nom;
    public void setDataMain() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the name of Cricketer: ");
cname = sc.nextLine();
        Scanner sc2 = new Scanner(System.in);
        System.out.print("Enter the Number of matches of Cricketer: ");
nom = sc2.nextInt();
    }
    public void displayDataMain() {         System.out.println("Name "
+cname);

        System.out.println("Matches " +nom);
    } } class Batsman extends
Cricketer {     public int
total_run;     public float
average;     public void
setData() {
        Scanner sc4 = new Scanner(System.in);
        System.out.print("\nEnter the Total Number of Runs: ");
total_run = sc4.nextInt();
    }
    public void displayData() {
        System.out.println("Total Runs "+total_run);
    } } class Bowler extends
Cricketer {     public int
wickets;     public float
average;     public void
setData() {
        Scanner sc3 = new Scanner(System.in);
        System.out.print("Enter the number of wickets: ");
wickets = sc3.nextInt();
    }
    public void displayData() {
```

```
        System.out.println("Wickets "+wickets);
    } } public class
prog_3 {
    public static void main(String[] args) {
        Bowler bowl = new Bowler();
        Batsman bat = new Batsman();         Cricketer
cal = new Cricketer();         cal.setDataMain();
bat.setData();         bowl.setData();
cal.displayDataMain();         bat.displayData();
bowl.displayData();         bowl.average = (float)
bowl.wickets/cal.nom;         bat.average = (float)
bat.total_run/cal.nom;
System.out.println("Average_Run's: "+bat.average);
        System.out.println("Average_Wicket's: "+bowl.average);
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_03.java

E:\Java\JOURNAL-2>java PRG_03
Enter the name of Cricketer: rohit sharma
Enter the Number of matches of Cricketer: 150

Enter the Total Number of Runs: 100000
Enter the number of wickets: 0
Name rohit sharma
Matches 150
Total Runs 100000
Wickets 0
Average_Run's: 666.6667
Average_Wicket's: 0.0
```

4. Write a program that will accept two strings or two numbers from command line and create overloaded method that add these two numbers or concate two strings.

```
import java.io.*; class prog_4 {     static boolean
isNumber(String s) {         for(int
i=0;i<s.length();i++)
if(Character.isDigit(s.charAt(i))==false)
return false;             return true;
    }
    void add(int a, int b) {
        System.out.println("Result is : "+(a+b));
        }
    void add(String a, String b) {
        System.out.println("Result is : "+(a+b));
    } public static void main(String[]
args) {     prog_4 obj = new prog_4();
    if(isNumber(args[0])&&isNumber(args[1]))
{         int a=Integer.parseInt(args[0]);
int b=Integer.parseInt(args[1]);
obj.add(a,b);
    }
    else
obj.add(args[0],args[1]);
    }
}
```

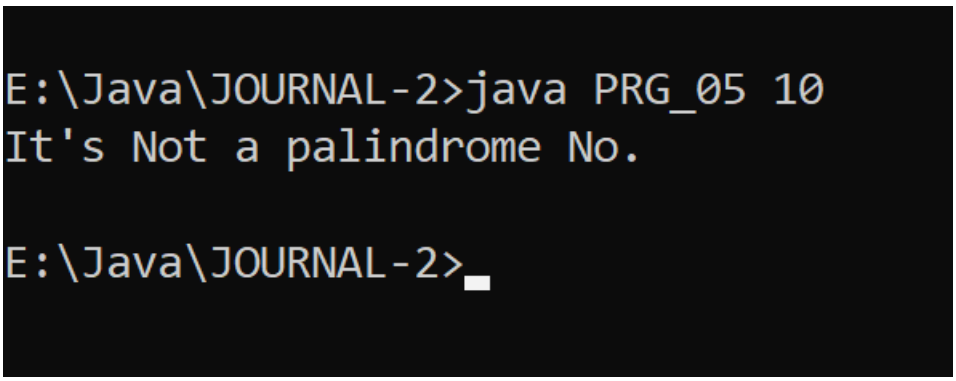
Output

```
E:\Java\JOURNAL-2>java PRG_04 2 2
Result is : 4

E:\Java\JOURNAL-2>java PRG_04 piyush patil
Result is : piyushpatil
```

5. Write a program that accept a number from command line and check whether it is palindrome or not.

```
public class prog_5 {     public static
void main(String args[]) {          int n =
Integer.parseInt(args[0]);          int sum
= 0, r;          int temp = n;
while(n>0) {                r = n % 10;
sum = (sum*10)+r;                n = n/10;
        }
        if(temp==sum)
            System.out.println("It is a Palindrome No.");
else
            System.out.println("It's Not a palindrome No.");
    }
}
```

Output



6. Write a program that will accept a string from command line and arrange all the characters in alphabetical order. E.g.
input- computer
output-cemoprtu

```
public class prog_6 {
    public static void main(String args[])
{         String str = args[0];          str
= str.toLowerCase();          int len =
str.length();
        String Result = ""; //Empty String
for (char ch = 'a'; ch <= 'z'; ch++) {
for (int i = 0; i < len; i++) {
char strCh = str.charAt(i);
if (ch == strCh) {
                    Result += strCh;
                }
            }
        }
    System.out.println("Alphabetical order : "+Result);
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_06.java

E:\Java\JOURNAL-2>java PRG_06 dcba
Alphabetical order : abcd

E:\Java\JOURNAL-2>
```

7. Write a program to create interface Area. Create three classes called rectangle, triangle and square calculate areas respectively.

```
import java.util.Scanner;
interface area {      double
calc(double x,double y);
}  class rectangle implements area {
public double calc(double x,double y)
    {
return(x*y);
    }  }  class triangle implements area {
public double calc(double x,double y) {
return((x*y)/2);
    }  }  class square implements area {
public double calc(double x,double y) {
return(x*x);
    }  }  class prog_7 {      public
static void main(String arg[]) {
int p,q;
        Scanner in = new
Scanner(System.in);         rectangle r =
new rectangle();          triangle c = new
triangle();          square s = new
square();          area a;          a = r;
        System.out.print("\nEnter hight of Rectangle : ");
p=in.nextInt();
        System.out.print("Enter width of Rectangle : ");
q=in.nextInt();
        System.out.println("\nArea of Rectangle is : " +a.calc(p,q));
a = c;
        System.out.print("\nEnter hight of Triangle : ");
p=in.nextInt();
        System.out.print("Enter Breath of Triangle : ");
q=in.nextInt();
        System.out.println("\nArea of Triangle is : " +a.calc(p,q));
a = s;
        System.out.print("\nEnter Side of Square : ");
p=in.nextInt();
        System.out.println("\nArea of Square is : " +a.calc(p,p));
    }
}
```

Output

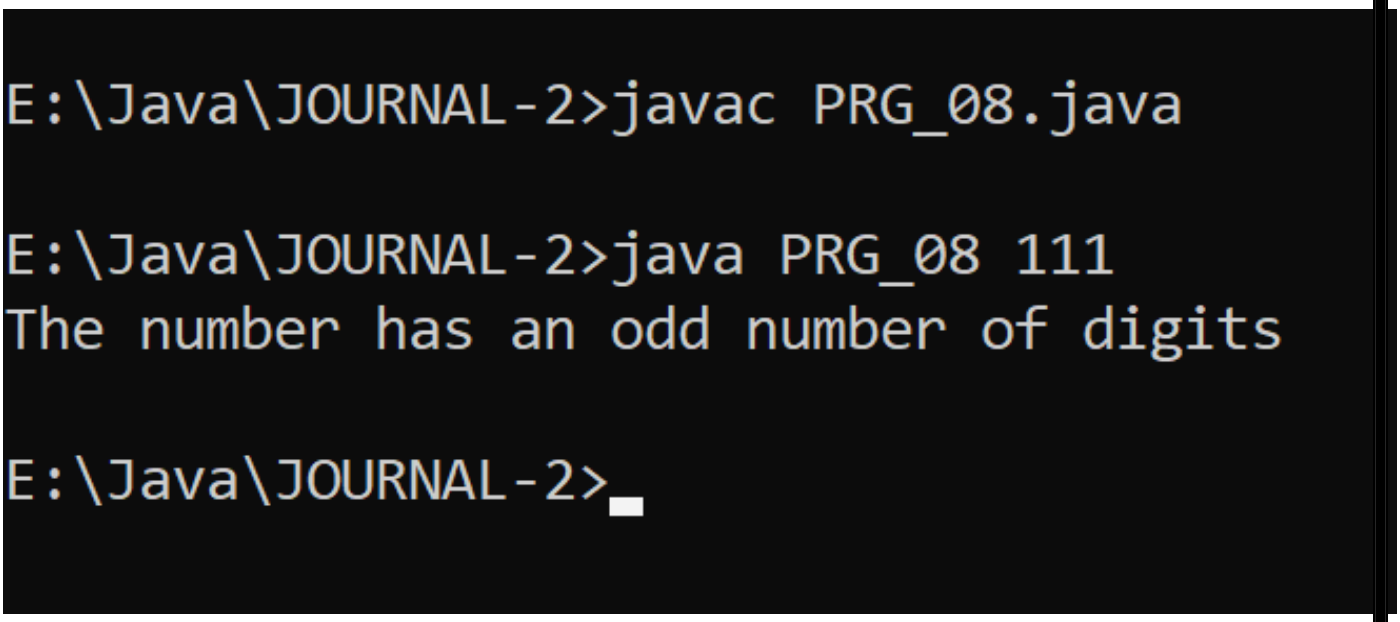
```
E:\Java\JOURNAL-2>javac PRG_07.java

E:\Java\JOURNAL-2>java PRG_07

Enter hight of Rectangle : 20
Enter width of Rectangle : 10

Area of Rectangle is : 200.0

Enter hight of Triangle : 18
Enter Breath of Triangle : 5

Area of Triangle is : 45.0

Enter Side of Square : 200

Area of Square is : 40000.0

E:\Java\JOURNAL-2>
```

8. Write a program that will accept a number from command line and raise a user defined exception if the number consists of odd number of digits.

```
class OddNumberOfDigitsException extends Exception {
public OddNumberOfDigitsException(String message) {
super(message);
    } } public class prog_8 {     public static void main(String[] args) {
int numberString = Integer.parseInt(args[0]);         int
temp=numberString;         int x;         try {
while(numberString>0) {                 x=numberString%10;
```

```
numberString=numberString/10;                    if (x % 2 != 0) {
throw new OddNumberOfDigitsException("The number has an odd number of
digits");
                }
            }
}
        catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Please provide a number as a command-line
argument.");         }
        catch (OddNumberOfDigitsException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Output



9. Write a java application which accepts 10 names of student and their age. Sort names and age in descending order. (Using Array)

```
import java.util.Arrays;
import java.util.Scanner;
public class prog_9 {
    public static void main(String[] args) {
        Scanner scanner = new
Scanner(System.in);         String[] names = new
String[10];         int[] ages = new int[10];
for (int i = 0; i < 10; i++) {
            System.out.print("Enter name of student " + (i + 1) + ": ");
names[i] = scanner.nextLine();
            System.out.print("Enter age of student " + (i + 1) + ":
");              ages[i] = scanner.nextInt();
scanner.nextLine();
        }
        while (true) {
            System.out.println("1. Sort via Name.");
            System.out.println("2. Sort via Age.");
            System.out.println("3. Exit");
            System.out.print("\nSelect Your Choice :
");              int choice = scanner.nextInt();
scanner.nextLine();             switch (choice) {
               case 1:
               for (int i = 0; i < 10; i++) {
for (int j = i + 1; j < 10; j++) {
                        if (names[i].compareToIgnoreCase(names[j]) < 0)
{                           String tempName = names[i];
names[i] = names[j];                                names[j] = tempName;
int tempAge = ages[i];                                ages[i] = ages[j];
ages[j] = tempAge;
                        }
                    }
                }
                System.out.println("\nSorted Names in Descending Order:");
for (int i = 0; i < 10; i++) {
                    System.out.println(names[i] + " : " + ages[i]);
                }
break;
case 2:
                for (int i = 0; i < 10; i++) {
for (int j = i + 1; j < 10; j++) {
if (ages[i] < (ages[j])) {
int tempage = ages[i];
ages[i] = ages[j];                              ages[j]
= tempage;                          String tempname
= names[i];                          names[i] =
```

```
names[j];                                   names[j] =
tempname;
                        }
                    }
                }
                System.out.println("\nSorted Ages in Descending Order:");
for (int i = 0; i < 10; i++) {
                    System.out.println(ages[i] + " - " + names[i]);
                }
break;
case 3:
                System.out.println("Exiting
program...");                   System.exit(0);
break;                  default:
                System.out.println("Invalid choice. Try again.");
            }
        }
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_09.java

E:\Java\JOURNAL-2>java PRG_09
Enter name of student 1: piyush
Enter age of student 1: 18
Enter name of student 2: sudhir
Enter age of student 2: 20
Enter name of student 3: kamlesh
Enter age of student 3: 20
Enter name of student 4: rohit
Enter age of student 4: 17
Enter name of student 5: bhatu
Enter age of student 5: 18
Enter name of student 6: rahul
Enter age of student 6: 21
Enter name of student 7: vishal
Enter age of student 7: 25
```

```
Enter name of student 8: om
Enter age of student 8: 18
Enter name of student 9: jayesh
Enter age of student 9: 19
Enter name of student 10: pratik
Enter age of student 10: 20

Select an option:
1. Sort via Name.
2. Sort via Age.
3. Exit

Select Your Choice : 1

Sorted Names in Descending Order:
vishal - 25
sudhir - 20
rohit - 17
rahul - 21
pratik - 20
piyush - 18
om - 18
kamlesh - 20
jayesh - 19
bhatu - 18
```

```
Select an option:
1. Sort via Name.
2. Sort via Age.
3. Exit

Select Your Choice : 2

Sorted Ages in Descending Order:
25 - vishal
21 - rahul
20 - sudhir
20 - pratik
20 - kamlesh
19 - jayesh
18 - piyush
18 - om
18 - bhatu
17 - rohit
```

```
Select an option:
1. Sort via Name.
2. Sort via Age.
3. Exit

Select Your Choice : 3
Exiting program...

E:\Java\JOURNAL-2>
```

10. Design a class MyString having a data member of type String and add member functions to achieve following task. (i) Reverse string (ii) String in Titlecase.
(iii) Extract N-characters from rightend of the string Write a menu driven program to call these methods of MyString class. The program should not terminate abruptly.

```
import java.util.Scanner;
public class prog_10 {
private String str;     public
prog_10(String str) {
this.str = str;
    }
    public String reverse() {
        StringBuilder sb = new StringBuilder(str);
return sb.reverse().toString();
    }
    public String titleCase() {
        String[] words = str.split("\\s+");
StringBuilder sb = new StringBuilder();         for (String word
: words) {             if (word.length() > 0) {
sb.append(Character.toUpperCase(word.charAt(0)));
sb.append(word.substring(1).toLowerCase());
sb.append(" ");
            }
        }         return
sb.toString().trim();
    }     public String
extractFromRight(int n) {         if (n >=
str.length()) {             return str;
        }         return
str.substring(str.length() - n);
    }
    public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
String inputString = scanner.nextLine();
prog_10 myString = new prog_10(inputString);
while (true) {
            System.out.println("1. Reverse the string");
            System.out.println("2.  Convert  the  string  to  title  case");
System.out.println("3.  Extract  N  characters  from  the  right-end  of  the
string");
            System.out.println("4. Exit");
            System.out.print("\nSelect Your Choice :
");             int choice = scanner.nextInt();
```

```
scanner.nextLine();             switch (choice) {
case 1:
                    System.out.println("Reversed string: "
+ myString.reverse());                  break;
case 2:
                    System.out.println("Title case string: "
+ myString.titleCase());                  break;
case 3:
                    System.out.print("Enter the number of characters to
extract: ");
                    int n = scanner.nextInt();
scanner.nextLine();
                    System.out.println("Extracted string: "
+ myString.extractFromRight(n));                  break;
case 4:
                    System.out.println("Exiting
program...");                      System.exit(0);
break;                 default:
                    System.out.println("Invalid choice. Try again.");
            }
        }
    }
}
```

Output

```
E:\Java\JOURNAL-2>javac PRG_10.java

E:\Java\JOURNAL-2>java PRG_10
Enter a string: piyush

Select an option:
1. Reverse the string
2. Convert the string to title case
3. Extract N characters from the right-end of the string
4. Exit

Select Your Choice : 1
Reversed string: hsuyip
```

```
Select an option:
1. Reverse the string
2. Convert the string to title case
3. Extract N characters from the right-end of the string
4. Exit

Select Your Choice : 2
Title case string: Piyush

Select an option:
1. Reverse the string
2. Convert the string to title case
3. Extract N characters from the right-end of the string
4. Exit

Select Your Choice : 3
Enter the number of characters to extract: 2
Extracted string: sh
```

```
Select an option:
1. Reverse the string
2. Convert the string to title case
3. Extract N characters from the right-end of the string
4. Exit

Select Your Choice : 4
Exiting program...

E:\Java\JOURNAL-2>
```