Q1. Write a program to input marks of students in 5 subjects, calculate total, average, and grade using methods and handle invalid marks using exception handling.

```
import java.util.*;

class StudentMarksEasy {
   static int findTotal(int m[]) {
      int sum = 0;
      for (int x : m)
         sum = sum + x;
      return sum;
   }

   static double findAverage(int total) {
      return total / 5.0;
   }

   static String findGrade(double avg) {
      if (avg >= 90) return "A";
      else if (avg >= 75) return "B";
      else if (avg >= 60) return "C";
      else if (avg >= 40) return "D";
      else return "Fail";
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      int marks[] = new int[5];
      try {
         for (int i = 0; i < 5; i++) {
            System.out.print("Enter marks of subject " + (i + 1) + ": ");
```

```
            marks[i] = sc.nextInt();
            if (marks[i] < 0 || marks[i] > 100)
                throw new Exception("Invalid Marks Entered!");
        }

        int total = findTotal(marks);
        double avg = findAverage(total);
        System.out.println("Total Marks = " + total);
        System.out.println("Average Marks = " + avg);
        System.out.println("Grade = " + findGrade(avg));
    } catch (Exception e) {
        System.out.println(e.getMessage());
    }
  }
}
```

Q.2 Accept item names, price, and quantity. Calculate total, apply discount if total > 2000, and display formatted bill using methods.

```
import java.util.*;

class SimpleBill {
   static double getTotal(double p[], int q[]) {
      double t = 0;
      for (int i = 0; i < p.length; i++)
         t = t + (p[i] * q[i]);
      return t;
   }

   static double giveDiscount(double total) {
      if (total > 2000)
         return total * 0.9; // 10% off
      else
         return total;
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter number of items: ");
      int n = sc.nextInt();

      String name[] = new String[n];
      double price[] = new double[n];
      int qty[] = new int[n];

      for (int i = 0; i < n; i++) {
         System.out.print("Item name: ");
```

```
            name[i] = sc.next();
            System.out.print("Price: ");
            price[i] = sc.nextDouble();
            System.out.print("Quantity: ");
            qty[i] = sc.nextInt();
        }

        double total = getTotal(price, qty);
        double finalAmt = giveDiscount(total);

        System.out.println("\n----- BILL -----");
        System.out.println("Total Amount: " + total);
        System.out.println("Final Amount (after discount): " + finalAmt);
    }
}
```

Q.3 Take a sentence and count the number of words and occurrences of a specific word using arrays and string methods.

```
import java.util.*;


class WordCounter {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a sentence: ");
      String s = sc.nextLine();


      String words[] = s.split(" ");
      System.out.println("Total words: " + words.length);


      System.out.print("Enter a word to search: ");
      String search = sc.next();


      int count = 0;
      for (String w : words) {
         if (w.equalsIgnoreCase(search))
            count++;
      }


      System.out.println("The word '" + search + "' appears " + count + " times.");
   }
}
```

Q.4 Check password strength: Length ≥ 8, contains uppercase, lowercase, digit, and symbol, throw exception if invalid.

```
import java.util.*;

class SimplePassword {
   static void checkPassword(String p) throws Exception {
      if (p.length() < 8)
         throw new Exception("Password too short!");
      if (!p.matches(".*[A-Z].*"))
         throw new Exception("Add at least one UPPERCASE letter!");
      if (!p.matches(".*[a-z].*"))
         throw new Exception("Add at least one lowercase letter!");
      if (!p.matches(".*[0-9].*"))
         throw new Exception("Add at least one number!");
      if (!p.matches(".*[!@#$%^&*()].*"))
         throw new Exception("Add at least one symbol!");
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter password: ");
      String pass = sc.nextLine();
      try {
         checkPassword(pass);
         System.out.println("Password is STRONG!");
      } catch (Exception e) {
         System.out.println("Error: " + e.getMessage());
      }
   }
}
```

Q.5 Simulate ATM operations like deposit, withdraw, and check balance. Handle insufficient balance with exception handling.

```
import java.util.*;

class SimpleATM {
  static double balance = 1000;

  static void deposit(double amt) {
    balance = balance + amt;
    System.out.println("Deposited ₹" + amt);
  }

  static void withdraw(double amt) throws Exception {
    if (amt > balance)
      throw new Exception("Not enough balance!");
    balance = balance - amt;
    System.out.println("Withdrawn ₹" + amt);
  }

  static void showBalance() {
    System.out.println("Current Balance = ₹" + balance);
  }

  public static void main(String args[]) {
    Scanner sc = new Scanner(System.in);
    try {
      System.out.println("1. Deposit  2. Withdraw  3. Check Balance");
      int ch = sc.nextInt();
      if (ch == 1) {
        System.out.print("Enter amount: ");
```

```
            deposit(sc.nextDouble());
        } else if (ch == 2) {
            System.out.print("Enter amount: ");
            withdraw(sc.nextDouble());
        } else if (ch == 3) {
            showBalance();
        } else {
            System.out.println("Invalid Option!");
        }
      } catch (Exception e) {
        System.out.println(e.getMessage());
      }
    }
}
```

Q.6 Accept basic salary and compute HRA, DA, PF, and gross salary. Handle invalid inputs with exceptions.

```
import java.util.*;


class SimpleSalary {
   static void calculate(double basic) throws Exception {
      if (basic <= 0)
         throw new Exception("Salary cannot be zero or negative!");


      double hra = 0.2 * basic;
      double da = 0.1 * basic;
      double pf = 0.05 * basic;
      double gross = basic + hra + da - pf;


      System.out.println("HRA = " + hra);
      System.out.println("DA = " + da);
      System.out.println("PF = " + pf);
      System.out.println("Gross Salary = " + gross);
   }
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      try {
         System.out.print("Enter basic salary: ");
         double basic = sc.nextDouble();
         calculate(basic);
      } catch (Exception e) {
         System.out.println(e.getMessage());
      }
   }
}
```

Q.7 Accept total bill and membership type (Silver / Gold / Platinum) and apply discounts accordingly using if-else and methods.

```
import java.util.*;

class Membership {
   static double discount(double bill, String type) {
      if (type.equalsIgnoreCase("Silver"))
         return bill * 0.95;
      else if (type.equalsIgnoreCase("Gold"))
         return bill * 0.90;
      else if (type.equalsIgnoreCase("Platinum"))
         return bill * 0.85;
      else
         return bill;
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter total bill: ");
      double bill = sc.nextDouble();
      System.out.print("Enter membership type: ");
      String type = sc.next();

      double finalBill = discount(bill, type);
      System.out.println("Final Amount to Pay: " + finalBill);
   }
}
```

Q.8 For ‘n’ products, store product name, price, and quantity in arrays. Calculate total stock value and handle out-of-stock errors using exception handling.

```
import java.util.*;

class ProductValue {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter number of products: ");
      int n = sc.nextInt();

      String name[] = new String[n];
      double price[] = new double[n];
      int qty[] = new int[n];
      double total = 0;

      try {
         for (int i = 0; i < n; i++) {
            System.out.print("Enter product name: ");
            name[i] = sc.next();
            System.out.print("Enter price: ");
            price[i] = sc.nextDouble();
            System.out.print("Enter quantity: ");
            qty[i] = sc.nextInt();

            if (qty[i] == 0)
               throw new Exception("Product " + name[i] + " is out of stock!");

            total = total + (price[i] * qty[i]);
         }
```

```
            System.out.println("Total Stock Value = " + total);
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Q.9 Process a coffee order: take customer size choice, calculate total price based on size and add-ons, and handle a list of 5 drink types.

```
import java.util.*;

class CoffeeOrder {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      String drinks[] = {"Espresso", "Latte", "Cappuccino", "Mocha", "Black Coffee"};
      double prices[] = {80, 100, 120, 130, 90};

      System.out.println("Available Drinks:");
      for (int i = 0; i < drinks.length; i++)
         System.out.println((i + 1) + ". " + drinks[i] + " - ₹" + prices[i]);

      System.out.print("Enter your choice (1-5): ");
      int choice = sc.nextInt();

      System.out.print("Enter size (S/M/L): ");
      char size = sc.next().charAt(0);
      double sizePrice = 0;

      if (size == 'S' || size == 's') sizePrice = 0;
      else if (size == 'M' || size == 'm') sizePrice = 20;
      else if (size == 'L' || size == 'l') sizePrice = 40;

      System.out.print("Add extra shot (y/n)? ");
      char add = sc.next().charAt(0);
      double addOn = (add == 'y' || add == 'Y') ? 20 : 0;

      double total = prices[choice - 1] + sizePrice + addOn;
```

```
        System.out.println("Total Price = ₹" + total);
    }
}
```

Q.10 Create a method that accepts two numbers and an operation symbol. Use switch to perform and return the result of addition, subtraction, multiplication, or division.

```
import java.util.*;

class SimpleCalc {
   static double calculate(double a, double b, char op) {
      switch (op) {
         case '+': return a + b;
         case '-': return a - b;
         case '*': return a * b;
         case '/': return b != 0 ? a / b : 0;
         default: System.out.println("Invalid Operator!");
                return 0;
      }
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter first number: ");
      double a = sc.nextDouble();
      System.out.print("Enter second number: ");
      double b = sc.nextDouble();
      System.out.print("Enter operator (+,-,*,/): ");
      char op = sc.next().charAt(0);

      double res = calculate(a, b, op);
      System.out.println("Result = " + res);
   }
}
```

Q.11 Input a string and count vowels, consonants, digits, and special characters using loops and conditionals.

```
import java.util.*;

class CountChars {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a string: ");
      String s = sc.nextLine();

      int vowels = 0, cons = 0, digits = 0, special = 0;
      s = s.toLowerCase();

      for (int i = 0; i < s.length(); i++) {
         char c = s.charAt(i);
         if ("aeiou".indexOf(c) != -1)
            vowels++;
         else if (c >= 'a' && c <= 'z')
            cons++;
         else if (c >= '0' && c <= '9')
            digits++;
         else
            special++;
      }
      System.out.println("Vowels: " + vowels);
      System.out.println("Consonants: " + cons);
      System.out.println("Digits: " + digits);
      System.out.println("Special Characters: " + special);
   }
}
```

Q.12 For n customers, input name, account type, and balance. Apply 4% interest for savings and 6% for fixed accounts, then display updated balances.

```
import java.util.*;

class BankInterest {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter number of customers: ");
      int n = sc.nextInt();

      String name[] = new String[n];
      String type[] = new String[n];
      double bal[] = new double[n];

      for (int i = 0; i < n; i++) {
         System.out.print("Name: ");
         name[i] = sc.next();
         System.out.print("Account Type (Savings/Fixed): ");
         type[i] = sc.next();
         System.out.print("Balance: ");
         bal[i] = sc.nextDouble();

         if (type[i].equalsIgnoreCase("Savings"))
            bal[i] += bal[i] * 0.04;
         else if (type[i].equalsIgnoreCase("Fixed"))
            bal[i] += bal[i] * 0.06;
      }

      System.out.println("\nUpdated Balances:");
      for (int i = 0; i < n; i++)
```

```
            System.out.println(name[i] + " - ₹" + bal[i]);
        }
    }
```

Q.13 Read 5 daily temperatures into an array. Use a loop and a method to convert each temperature from Celsius to Fahrenheit, displaying both.

```
import java.util.*;


class TempConvert {
   static double toFahrenheit(double c) {
      return (c * 9 / 5) + 32;
   }


   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      double c[] = new double[5];
      System.out.println("Enter 5 temperatures in Celsius:");
      for (int i = 0; i < 5; i++)
         c[i] = sc.nextDouble();


      System.out.println("Celsius\tFahrenheit");
      for (int i = 0; i < 5; i++)
         System.out.println(c[i] + "\t" + toFahrenheit(c[i]));
   }
}
```

Q.14 Accept number of units consumed and calculate bill based on slab rates using conditionals and methods.

```
import java.util.*;

class ElectricityBill {
   static double calcBill(int units) {
      double bill;
      if (units <= 100)
         bill = units * 5;
      else if (units <= 300)
         bill = (100 * 5) + (units - 100) * 7;
      else
         bill = (100 * 5) + (200 * 7) + (units - 300) * 10;
      return bill;
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter units consumed: ");
      int u = sc.nextInt();
      System.out.println("Total Bill = ₹" + calcBill(u));
   }
}
```

Q.15 Input a string and check if it's a palindrome (ignore case and spaces). Use string methods and exception handling.

```
import java.util.*;

class PalindromeCheck {
   static boolean isPalindrome(String s) {
      s = s.replaceAll(" ", "").toLowerCase();
      String rev = new StringBuilder(s).reverse().toString();
      return s.equals(rev);
   }

   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a string: ");
      String str = sc.nextLine();

      try {
         if (str.trim().isEmpty())
            throw new Exception("Empty String Not Allowed!");
         if (isPalindrome(str))
            System.out.println("It is a Palindrome!");
         else
            System.out.println("Not a Palindrome!");
      } catch (Exception e) {
         System.out.println(e.getMessage());
      }
   }
}
```

Q.16 Read a word (String). Use a loop and a switch on each character to replace 'a' with '4', 'e' with '3', and 'o' with '0'.

```
import java.util.*;

class ReplaceChar {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter a word: ");
      String word = sc.nextLine();

      String result = "";
      for (int i = 0; i < word.length(); i++) {
         char ch = word.charAt(i);
         switch (ch) {
            case 'a': result += '4'; break;
            case 'e': result += '3'; break;
            case 'o': result += '0'; break;
            default: result += ch;
         }
      }

      System.out.println("Modified Word: " + result);
   }
}
```