**Exception Handling**

Q1. Electricity Bill Calculation with Exception Handling Design a Java program to calculate the electricity bill for a customer, including exception handling for invalid input values. Implement a class named ElectricityBill with the following specifications:

Code:-

import java.lang.\*;

import java.util.\*;

class ElectricityBill{

String customerName;

double unitsConsumed;

double billAmount;

void calculateBillAmount() {

if (unitsConsumed <= 100) {

billAmount = unitsConsumed \* 5; // Rs. 5 per unit for first 100 units

} else if (unitsConsumed <= 300) {

billAmount = 100 \* 5 + (unitsConsumed - 100) \* 7; // Rs. 7 per unit for 101 to 300 units

} else {

billAmount = 100 \* 5 + 200 \* 7 + (unitsConsumed - 300) \* 10; // Rs. 10 per unit above 300 units

}

}

public ElectricityBill(String customerName, double unitsConsumed ){

if (unitsConsumed < 0) {

throw new IllegalArgumentException("Units consumed cannot be negative.");

}

this.customerName=customerName;

this.unitsConsumed=unitsConsumed;

calculateBillAmount(); // Automatically calculate bill after object creation

}

void printBill(){

System.out.println("enter customer name : " +customerName);

System.out.println("enter unitsConsumed : "+unitsConsumed);

System.out.println("Bill amount is: "+billAmount);

}

public static void main(String[] args){

Scanner sc= new Scanner(System.in);

try{

System.out.println("enter customer name : ");

String customerName=sc.nextLine();

System.out.println("enter unitsConsumed : ");

double unitsConsumed=sc.nextDouble();

// Create ElectricityBill object

ElectricityBill bill = new ElectricityBill(customerName, unitsConsumed);

// Print the bill details

bill.printBill();

} catch (InputMismatchException e) {

System.out.println("Error: Invalid input! Please enter a numeric value for units consumed.");

} catch (IllegalArgumentException e) {

System.out.println("Error: " + e.getMessage());

} finally {

sc.close(); // Close the scanner resource

}

}

}

**Output:-**

**enter customer name :**

**sakshi**

**enter unitsConsumed :**

**54**

**enter customer name : sakshi**

**enter unitsConsumed : 54.0**

**Bill amount is: 270.0**

Q2. Student Marks and Grade Calculation with Exception Handling

**Codes:-**

import java.util.\*;

class Student{

String name;

int rollNo;

double marks[]=new double[5];

double average;

char grade;

//constructor

public Student(String name,int rollNo,double marks[]){

for (double mark : marks) {

if (mark < 0 || mark > 100) {

throw new IllegalArgumentException("Mark should be between 0 and 100.");

}

}

this.name=name;

this.rollNo=rollNo;

this.marks=marks;

}

public void calculateAverage(){

double sum=0;

for(int i=0;i<5;i++){

sum+=marks[i];

}

average=sum / 5;

}

public void calculateGrade() {

if (average >= 90) {

grade = 'A';

} else if (average >= 80) {

grade = 'B';

} else if (average >= 70) {

grade = 'C';

} else if (average >= 60) {

grade = 'D';

} else {

grade = 'F';

}

}

public void displayStudentInfo(){

System.out.println("Enter student name : "+name);

System.out.println("Enter student roll No : "+rollNo);

System.out.print("Marks: ");

for (double mark : marks) {

System.out.print(mark + " ");

}

System.out.println();

System.out.println(" average of marks : "+average);

System.out.println("Grade: "+grade);

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

try {

// user for student details

System.out.print("Enter student's name: ");

String name = sc.nextLine();

System.out.print("Enter roll number: ");

int rollNo = sc.nextInt();

// Get marks for 5 subjects

double[] marks = new double[5];

System.out.println("Enter marks for 5 subjects (between 0 and 100):");

for (int i = 0; i < 5; i++) {

System.out.print("Mark for subject " + (i + 1) + ": ");

marks[i] = sc.nextDouble();

}

// Create a Student object

Student student = new Student(name, rollNo, marks);

// Calculate average and grade

student.calculateAverage();

student.calculateGrade();

// Display student information

student.displayStudentInfo();

} catch (InputMismatchException e) {

System.out.println("Error: Invalid input! Please enter a numeric value.");

} catch (IllegalArgumentException e) {

System.out.println("Error: " + e.getMessage());

} finally {

sc.close(); // Close the scanner resource

}

}

}

**Output:-**

**Enter student's name: sarika**

**Enter roll number: 120**

**Enter marks for 5 subjects (between 0 and 100):**

**Mark for subject 1: 45**

**Mark for subject 2: 75**

**Mark for subject 3: 76**

**Mark for subject 4: 44**

**Mark for subject 5: 88**

**Enter student name : sarika**

**Enter student roll No : 120**

**Marks: 45.0 75.0 76.0 44.0 88.0**

**average of marks : 65.6**

**Grade: D**