Rajalakshmi Engineering College

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 8_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What will be the output for the following code?

```
class InvalidUsernameException extends Exception {
    public InvalidUsernameException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            String username = "abc";
            if (username.length() < 5) {
                throw new InvalidUsernameException("Username must be at
least 5 characters long");
            }
```

```
        } catch (InvalidUsernameException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Answer

Username must be at least 5 characters long

Status : Correct ***Marks : 1/1***

2. Which of the following is true about custom exceptions?

Answer

Custom exceptions must extend either Exception or RuntimeException

Status : Correct ***Marks : 1/1***

3. Which keyword is used to explicitly throw a custom exception?

Answer

throw

Status : Correct ***Marks : 1/1***

4. What is the purpose of a custom exception in Java?

Answer

To create user-defined exceptions for specific scenarios

Status : Correct ***Marks : 1/1***

5. What will be the output of the following code?

```
class MyException extends Exception {
    public MyException() {
        super("Default Exception Message");
```

```
    }
}

class Test {
    public static void main(String[] args) {
        try {
            throw new MyException();
        } catch (MyException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Answer

Default Exception Message

Status : Correct ***Marks : 1/1***

6. What will be the output for the following code?

```
import java.io.*;

class TemperatureTooHighException extends Exception {
    public TemperatureTooHighException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int temperature = 110;
            if (temperature > 100) {
                throw new TemperatureTooHighException("Temperature too
high");
            }
        } catch (TemperatureTooHighException e) {
            System.out.println(e.getMessage());
        }
```

```
    }
}
```

Answer

Temperature too high

Status : Correct ***Marks : 1/1***

7. What will be the output for the following code?

```
class InvalidVotingAgeException extends Exception {
    public InvalidVotingAgeException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int age = 15;
            if (age < 18) {
                throw new InvalidVotingAgeException("You are not eligible to
vote");
            }
            System.out.println("Eligible to vote");
        } catch (InvalidVotingAgeException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Answer

You are not eligible to vote

Status : Correct ***Marks : 1/1***

8. what is the output of the following code?

```
class MyException extends Exception {
```

```
    public MyException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            throw new MyException("Error occurred");
        } catch (MyException e) {
            System.out.println(e);
        }
    }
}
```

Answer

MyException: Error occurred

Status : Correct ***Marks : 1/1***

9. What will be the output for the following code?

```
import java.io.*;

class NegativeAgeException extends Exception {
    public NegativeAgeException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int age = -5;
            if (age < 0) {
                throw new NegativeAgeException("Age cannot be negative");
            }
        } catch (NegativeAgeException e) {
            System.out.println(e.getMessage());
```

```
    }
  }
}
```

Answer

Age cannot be negative

Status : Correct ***Marks : 1/1***

10. what is the output of the following code?

```
class MyException extends Exception {
  public MyException(String message) {
    super(message);
  }
}

class Test {
  static void check() throws MyException {
    throw new MyException("Custom Exception Occurred");
  }

  public static void main(String[] args) {
    try {
      check();
    } catch (Exception e) {
      System.out.println(e.getMessage());
    }
  }
}
```

Answer

Custom Exception Occurred

Status : Correct ***Marks : 1/1***

11. What will be the output for the following code?

```
import java.io.*;
```

```
class OutOfStockException extends Exception {
    public OutOfStockException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int stock = 0;
            if (stock == 0) {
                throw new OutOfStockException("Item is out of stock");
            }
        } catch (OutOfStockException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Answer

Item is out of stock

Status : Correct ***Marks : 1/1***

12. What will happen if a checked custom exception is thrown inside a method without being caught or declared?

Answer

Compilation Error

Status : Correct ***Marks : 1/1***

13. How do you create an unchecked custom exception?

Answer

By extending RuntimeException

Status : Correct ***Marks : 1/1***

14. What will be the output for the following code?

```
import java.io.*;

class UnderageException extends Exception {
    public UnderageException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
            int age = 17;
            if (age < 18) {
                throw new UnderageException("Underage, cannot proceed");
            }
        } catch (UnderageException e) {
            System.out.println(e.getMessage());
        }
    }
}
```

Answer

Underage, cannot proceed

Status : Correct ***Marks : 1/1***

15. What will be the output for the following code?

```
class NegativeBalanceException extends Exception {
    public NegativeBalanceException(String message) {
        super(message);
    }
}

class Test {
    public static void main(String[] args) {
        try {
```

```
            double balance = -500;
            if (balance < 0) {
                throw new NegativeBalanceException("Balance cannot be
negative");
            }
        } catch (NegativeBalanceException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}
```

Answer

Error: Balance cannot be negative

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Write a program to validate the email address and display suitable exceptions if there is any mistake.

Create 3 custom exception classes as below

DotExceptionAtTheRateExceptionDomainException

A typical email address should have a " . " character, and a "@" character, and also the domain name should be valid. Valid domain names for practice be 'in', 'com', 'net', or 'biz'.

Display Invalid Dot usage, Invalid @ usage, or Invalid Domain message based on email id.

Get the email address from the user, validate the email by checking the

above-mentioned criteria, and print the validity status of the input email address.

Input Format

The first line of input contains the email to be validated.

Output Format

The output prints a Valid email address or an Invalid email address along with the suitable exception

If email ends with . or contains not exactly one . after @, it throws:

DotException: Invalid Dot usage

Invalid email address

If @ appears not exactly once, it throws:

AtTheRateException: Invalid @ usage

Invalid email address

If the part after the last dot is not among accepted domains:

DomainException: Invalid Domain

Invalid email address

If all conditions satisfied then print:

Valid email address

Refer to the sample input and output for format specifications.

Sample Test Case

Input: sample@gmail.com

Output: Valid email address

Answer

```
// You are using Java
import java.util.*;
class DotException extends Exception{
    public DotException (String s){
        System.out.println(s);

    }
}
class AtTheRateException extends Exception{
    public AtTheRateException (String s){
        System.out.println(s);
    }
}
class DomainException extends Exception{
    public DomainException (String s){
        System.out.println(s);
    }
}
class main{
    public static void main(String [] args){
        try{
        String [] domains={"in","com","net","biz"};
        int flag=0;
        Scanner scan=new Scanner(System.in);
        String mail=scan.nextLine();
        int count_dots=0;
        int count_atrate=0;
        for(char i:mail.toCharArray()){
            if(i=='.'){
                count_dots+=1;
            }
        }
```

```
        for(char i:mail.toCharArray()){
            if(i=='@'){
                count_atrate+=1;
            }
        }
        if(count_dots>1){
            throw new DotException("DotException: Invalid Dot usage");
        }
        if(count_atrate!=1){
            throw new AtTheRateException("AtTheRateException: Invalid @ usage");
        }
        for(String domain:domains){
            if(mail.contains(domain)){
                flag=1;
                System.out.println("Valid email address");
                break;
            }
        }
        if(flag==0){
             throw new DomainException("DomainException: Invalid Domain");
        }
        }
        catch (Exception e){
            System.out.println("Invalid email address");
        }
    }
}
```

Status : Correct **Marks : 10/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Elsa, a busy professional, is using a scheduling application to plan her meetings efficiently. The application requires users to input meeting durations in minutes, ensuring that the duration is a positive integer and does not exceed 240 minutes (4 hours). Elsa needs a program to assist her in scheduling meetings securely with proper exception handling.

Create a Java class named ElsaMeetingScheduler.Implement a custom exception:InvalidDurationException for invalid meeting duration entries.Implement the main method to interactively take user input for a meeting duration.Implement the validateMeetingDuration method to validate the meeting duration based on the specified rules and throw a custom exception if the validation fails.Print appropriate success or error messages based on the meeting duration.

Implement a custom exception, InvalidDurationException, to handle cases where the entered meeting duration does not meet the specified criteria.

Input Format

The input consists of an integer value 'n', representing the meeting duration.

Output Format

The output is displayed in the following format:

If the entered meeting duration meets the specified criteria, the program outputs

"Meeting scheduled successfully!"

If the entered meeting duration is invalid, the program outputs an error message indicating the issue.

"Error: Invalid meeting duration. Please enter a positive integer not exceeding 240 minutes (4 hours)."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 120
Output: Meeting scheduled successfully!

Answer

```
// You are using Java
import java.util.Scanner;
class InvalidDurationException extends Exception{
   InvalidDurationException(String s){
      super(s);
   }
}
class ElsaMeetingScheduler{
   public static void main(String [] args){
      try{
      Scanner scan=new Scanner(System.in);
      int min=scan.nextInt();
```

```
        if(min<=240 && min>=0){
            System.out.println("Meeting scheduled successfully!");
        }
        else{
            throw new InvalidDurationException("Error:Invalid meeting duration.
Please enter a positive integer not exceeding 240 minutes(4 hours).");
        }

    }
    catch(InvalidDurationException e){
        System.out.println(e.getMessage());
    }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a user registration system, there is a requirement to implement a username validation module. Users attempting to register must adhere to specific criteria for their usernames to be considered valid.

Your task is to develop a program that takes user input for a desired username and validates it according to the following rules:

The username must not contain any spaces.The username must be at least 5 characters long.

Implement a custom exception, InvalidUsernameException, to handle cases where the entered username does not meet the specified criteria.

Input Format

The input consists of a string S, representing the desired username.

Output Format

If the username is valid, print "Username is valid: [S]".

If the username is invalid:

1. If the username is short, print "Invalid Username: Username must be at least 5 characters long"
2. If the username contains spaces, print "Invalid Username: Username cannot contain spaces"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: John

Output: Invalid Username: Username must be at least 5 characters long

Answer

```
// You are using Java
import java.util.Scanner;
class InvalidUsernameException extends  Exception{
   InvalidUsernameException(String s){
      super(s);
   }
}
class main{
   public static void main(String [] args){
      try{
         Scanner scan=new Scanner(System.in);
         String username=scan.nextLine();
         if(username.length()>=5 && !username.contains(" ")){
            System.out.println("Username is valid: "+username);
         }
         else if(!(username.length()>=5)){
            throw new InvalidUsernameException("Invalid Username: Username
must be at least 5 characters long");
         }
         else if(username.contains(" ")){
```

```
            throw new InvalidUsernameException("Invalid Username: Username
cannot contain spaces");
        }
      }
      catch(InvalidUsernameException e){
         System.out.println(e.getMessage());
      }
   }
}
```

Status : Correct **Marks : 10/10**

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Scan to verify results

2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

A local municipality is implementing an online voting system for a community event and wants to ensure that only eligible voters (those aged 18 or older) can participate.

Your task is to develop a program that validates the age of individuals attempting to vote online. If the user's age is below 18, the program should throw a custom exception, InvalidAgeException, preventing them from casting their vote. If the input is invalid, catch the appropriate InputMismatchException and print the in-built exception message.

Input Format

The input consists of an integer representing the age.

Output Format

If the age is 18 or older, print "Eligible to vote"

If the age is below 18, print "Exception occurred: InvalidAgeException: Age is not valid to vote"

If there is any other type of exception, print "An error occurred: " followed by the in-built exception message.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20
Output: Eligible to vote

Answer

```
// You are using Java
import java.util.*;
class InvalidAgeException extends Exception{
   InvalidAgeException(String s)
   {
      super(s);
   }
}
class main{
   public static void main(String [] args){
      try{
         Scanner scan =new Scanner(System.in);
         int age=scan.nextInt();
         if(age>=18){
            System.out.println("Eligible to vote");
         }
         else{
            throw new InvalidAgeException("Exception occurred:
InvalidAgeException: Age is not valid to vote");
         }
      }
      catch(InvalidAgeException e){
         System.out.println(e.getMessage());
      }
```

```
        catch(InputMismatchException e){
            System.out.println("An error occurred: "+e);
        }
    }
}
```

Status : Correct ***Marks : 10/10***

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Scan to verify results

2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a file management system, users are required to provide a valid file name when creating new files. The system enforces specific rules for file names to maintain consistency and avoid potential issues. Your task is to implement a Java program named FileNameValidator that takes user input for a file name and validates it according to the specified rules.

Rules for Valid File Name:

The file name must consist of alphanumeric characters (letters and digits) only.The file name must have a minimum length of 3 characters.

Implement a custom exception, FileNameValidator, to handle cases where the entered filename does not meet the specified criteria.

Input Format

The input consists of a string S, representing the desired filename.

Output Format

The output is displayed in the following format:

If the entered file name meets the specified criteria, the program outputs

"Valid file name"

If the entered file name does not meet the criteria and triggers the InvalidFileNameException, the program outputs

"Error: Invalid file name. It must be alphanumeric and have a minimum length of 3 characters."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: myfile123

Output: Valid file name

Answer

```
// You are using Java
import java.util.*;
class InvalidFileNameException extends Exception{
    InvalidFileNameException(String s){
        super(s);
    }
}
class FileNameValidator{
    public static void main(String [] args){
        try{
            Scanner scan =new Scanner(System.in);
            String file=scan.nextLine();
            int flag=1;
            for(char i:file.toCharArray()){
                if((i>='a'&&i<='z')||(i>='A'&&i<='Z')||(i>='0'&&i<='9')){
                    continue;
                }
```

```
            else{
                flag=0;
                throw new InvalidFileNameException("Error: Invalid file name. It must
be alphanumeric and have a minimum length of 3 characters.");


            }
        }
        if(file.length()<3){
            throw new InvalidFileNameException("Error: Invalid file name. It must
be alphanumeric and have a minimum length of 3 characters.");
        }
        else if(file.length()>=3 && flag==1)
        System.out.println("Valid file name");


    }
    catch(InvalidFileNameException e){
        System.out.println(e.getMessage());
    }
  }
}
```

Status : Correct **Marks : 10/10**

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Scan to verify results

2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 8_PAH

Attempt : 1
Total Mark : 40
Marks Obtained : 40

Section 1 : Coding

1. Problem Statement

Enigma is developing a simple web application that takes a user-input URL, validates it, and throws a custom exception InvalidURLFormatException if the URL does not start with "http://" or "https://".

The main method prompts the user for input, validates the URL, and prints whether it is valid or not.

Input Format

The input consists of a string, representing the URL entered by the user.

Output Format

The output displays one of the following results:

If the entered URL is valid according to the specified format, the program prints:

"[URL] is a valid URL"

If the entered URL is not valid according to the specified format, the program prints:

"Invalid URL format: [URL]"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: http://www.example.com

Output: http://www.example.com is a valid URL

Answer

```
// You are using Java
import  java.util.*;
class InvalidURLFormatException extends Exception{
   InvalidURLFormatException(String s){
      super(s);
   }
}

class main{
   public static void main (String [] args){
      try{
      Scanner scan =new Scanner(System.in);
      String url=scan.nextLine();
      if(url.contains("http://")||url.contains("https://")){
         System.out.println(url+" is a valid URL");
      }
      else {
         throw new InvalidURLFormatException("Invalid URL format:"+url);
      }}
      catch(InvalidURLFormatException e){
```

```
            System.out.println(e.getMessage());
        }
    }

}
```

Status : Correct **Marks : 10/10**

2. Problem Statement

Daniel is developing a program to verify the age of users. He wants to ensure that the entered age is within a valid range. Write a program to help Daniel implement this age-checking feature using custom exceptions.

Daniel needs a program that takes an integer input representing a person's age.If the age is between 0 and 150 (inclusive), the program should print "Age is valid!".If the age is less than 0 or greater than 150, the program should throw a custom exception (InvalidAgeException) with the message "Invalid age. Please enter an age between 0 and 150."

Implement a custom exception, InvalidAgeException, to handle cases where the entered age does not meet the specified criteria.

Input Format

The input consists of an integer value 'n', representing the age.

Output Format

The output is displayed in the following format:

If the age is valid (between 0 and 150, inclusive), print

"Age is valid!".

If the age is invalid, print

"Error: Invalid age. Please enter an age between 0 and 150."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 45

Output: Age is valid!

Answer

```
// You are using Java
import java.util.Scanner;
class InvalidAgeException extends Exception{
    InvalidAgeException(String s){
        super(s);
    }
}
class main{
   public static void main(String [] args){
      try{
         Scanner scan=new Scanner(System.in);
         int age=scan.nextInt();
         if(age>=0 && age<=150){
            System.out.println("Age is valid!");
         }
         else{
            throw new InvalidAgeException("Error: Invalid age. Please enter an age
between 0 and 150.");
         }
      }
      catch(InvalidAgeException e){
         System.out.println(e.getMessage());
      }
   }
}
```

Status : Correct ***Marks : 10/10***

3. Problem Statement

You are tasked to create a program that defines a custom exception GradeException. The program should include a Student class with fields for the student's name, age, and grade. Implement a method in the Student

class that checks the grade, and if the grade is below 40, it should throw a GradeException. Otherwise, it should display the student's details.

Input Format

The input consists of three parameters in separate lines:

1. A string representing the student's name.
2. An integer representing the student's age.
3. An integer representing the student's grade.

Output Format

The output will display the student's details if the grade is valid.

If the grade is below 40, the program will display an error message "Grade is below 40".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Alice
20
85

Output: Name: Alice
Age: 20
Grade: 85

Answer

```
// You are using Java
import java.util.*;
class GradeException extends Exception{
   GradeException(String s){
      super(s);
   }
}
class main{
   public static void main(String [] args) throws GradeException{
      try{Scanner scan=new Scanner(System.in);
      String name=scan.nextLine();
```

```
        int age=scan.nextInt();
        int grade=scan.nextInt();
        if(grade<40){
            throw new GradeException("Grade is below 40");
        }
        else{
            System.out.println("Name: "+name);
            System.out.println("Age: "+age);
            System.out.println("Grade: "+grade);
        }}
        catch(GradeException e){
            System.out.println(e.getMessage());
        }
    }
}
```

Status : Correct **Marks : 10/10**

4. Problem Statement

An HR software system is being developed to process employee payrolls. During payroll processing, the system must ensure that no employee has a negative salary and that no employee's salary exceeds 2,00,000. If either condition occurs, the system should throw a custom exception.

Create a custom exception InvalidSalaryException and a class Employee that processes salary according to the following rules:

If salary < 0, throw InvalidSalaryException with the message: "Salary cannot be negative". If salary > 200000, throw InvalidSalaryException with the message: "Salary exceeds threshold limit". Otherwise, display: "Salary processed successfully for <empName>: <salary>".

The payroll processing should always display: "Payroll process completed" at the end, regardless of whether an exception occurs.

Input Format

The first line of input contains an integer representing the employee ID.

The second line contains a string representing the employee's name.

The third line contains a floating-point number representing the salary of the employee.

Output Format

If the salary is valid: "Salary processed successfully for <empName>: <salary>"

"Payroll process completed"

If the salary is invalid: "<Exception Message>"

"Payroll process completed"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 101
Rahul
150000.0
Output: Salary processed successfully for Rahul: 150000.0
Payroll process completed

Answer

```
// You are using Java
import java.util.*;
class InvalidSalaryException extends Exception{
    InvalidSalaryException(String s){
        super(s);
    }
}
class main{
    public static void main(String [] args){
        try{
        Scanner scan=new Scanner(System.in);
        int empid=Integer.parseInt(scan.nextLine());
        String name=scan.nextLine();
        double salary=scan.nextDouble();
        if(salary<0){
            throw new  InvalidSalaryException("Salary cannot be negative");
```

```
    }
    else if(salary>200000){
        throw new  InvalidSalaryException("Salary exceeds threshold limit");
    }
    else{
        System.out.println("Salary processed successfully for"+name+": "+salary);
    }
    }
    catch(InvalidSalaryException e){
        System.out.println(e.getMessage());
    }
    finally{
        System.out.println("Payroll process completed");
    }
  }
}
```

Status : Correct **Marks : 10/10**

Rajalakshmi Engineering College

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Scan to verify results

2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 8_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 40

Section 1 : Coding

1. Problem Statement

Hemanth is designing a banking system for XYZ Bank. The system should allow customers to perform deposit, withdrawal, and balance inquiry operations. Implement exception handling for scenarios involving invalid transaction amounts or insufficient funds.

Create two custom exception classes, InvalidAmountException and InsufficientFundsException, both extending the Exception class.Throw an InvalidAmountException with a message if the deposit amount is less than or equal to zero.Throw an InsufficientFundsException if the withdrawal amount is greater than the available balance.Deduct the withdrawal amount from the balance if the withdrawal is successful.

Assist Hemanth in designing the program.

Input Format

The first line of input consists of a double value B, representing the initial balance.

The second line consists of a double value D, representing the deposit amount.

The third line consists of a double value W, representing the withdrawal amount.

Output Format

If the withdrawal is successful, print the amount withdrawn and the current balance, rounded off to one decimal place.

If an InvalidAmountException occurs, print "Error: [D] is not valid".

If an InsufficientFundsException occurs, print "Error: Insufficient funds".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1050.1
270.2
150.3
Output: Amount Withdrawn: 150.3
Current Balance: 1170.0

Answer

```
import java.util.*;
class InvalidAmountException extends Exception {
   public InvalidAmountException(String message) {
      super(message);
   }
}

class InsufficientFundsException extends Exception {
   public InsufficientFundsException(String message) {
      super(message);
   }
}
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        double balance = sc.nextDouble();
        double deposit = sc.nextDouble();
        double withdraw = sc.nextDouble();

        try {
            if (deposit <= 0) {
                throw new InvalidAmountException(deposit + " is not valid");
            }
            balance += deposit;

            if (withdraw > balance) {
                throw new InsufficientFundsException("Insufficient funds");
            }

            balance -= withdraw;
            System.out.printf("Amount Withdrawn: %.1f Current Balance: %.1f\n",
withdraw, balance);
        } catch (InvalidAmountException e) {
            System.out.println("Error: " + e.getMessage());
        } catch (InsufficientFundsException e) {
            System.out.println("Error: " + e.getMessage());
        }

        sc.close();
    }
}
```

Status : Correct **Marks : 10/10**

2. Problem Statement

Alice is designing a program that requires users to enter positive numbers. She wants to implement a solution that validates whether the entered number is positive. In case the input is not a positive number, she wants to throw a custom exception.

The number should be a positive integer.If this condition is violated, the

program should throw a custom exception:InvalidPositiveNumberException with the message "Invalid input. Please enter a positive integer."

Implement a custom exception, InvalidPositiveNumberException , to handle cases where the entered number does not meet the specified criteria.

Input Format

The input consists of an integer value 'n', representing the entered number.

Output Format

The output is displayed in the following format:

If the validation passes, print

"Number {number} is positive."

The {number} represents the entered positive integer.

If the entered number is negative then it displays

"Error: Invalid input. Please enter a positive integer."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 100
Output: Number 100 is positive.

Answer

```
// You are using Java
import java.util.*;
class InvalidPositiveNumberException extends Exception{
    InvalidPositiveNumberException(String s){
        super(s);
    }
}
```

```
class main{
    public static void main(String [] args){
        try{
            Scanner scan=new Scanner(System.in);
            int num=scan.nextInt();
            if(num<0){
                throw new InvalidPositiveNumberException("Error: Invalid input. Please
enter a positive integer.");
            }
            else{
                System.out.println("Number "+num+" is positive.");
            }
        }
        catch(InvalidPositiveNumberException e){
            System.out.println(e.getMessage());
        }
    }
}
```

Status : Correct **Marks : 10/10**

3. Problem Statement

Theo is trying to update his payment information on a subscription-based streaming service. To proceed, the system requires Theo to provide a valid credit card number consisting of 16 digits. However, Theo wants to make sure that the credit card number he enters meets the specified criteria with proper exception handling.

The credit card number must consist of exactly 16 digits.If the entered credit card number does not meet the specified criteria, the program should throw a custom exception, InvalidCreditCardException, and provide Theo with specific error messages:If the length of the credit card number is not 16 digits, the exception message should be: "Invalid credit card number length."If the credit card number contains non-numeric characters, the exception message should be: "Invalid credit card number format."

Implement a custom exception, InvalidCreditCardException, to fulfill Theo's requirements and keep his payment information secure.

Input Format

The input consists of a string value 's', consisting of the 16-digit credit card number.

Output Format

The output is displayed in the following format:

If the entered credit card number is valid, the program should output a success message:

"Payment information updated successfully!"

If the entered credit card has more than 16 digits or less than 16 digits it displays

"Error: Invalid credit card number length."

If the entered 16-digit credit card has non-integers it displays

"Error: Invalid credit card number format."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1234567890123456
Output: Payment information updated successfully!

Answer

```
// You are using Java
import java.util.*;
class InvalidCreditCardException extends Exception{
   InvalidCreditCardException(String s){
      super(s);
   }
}
class main{
   public static void main(String [] args){
      try{
```

```
        Scanner scan=new Scanner(System.in);
        String num=scan.nextLine();
        int flag=1;
        for(char i:num.toCharArray()){
            if(i>='0' &&i<='9'){
                continue;
            }
            else{
                flag=0;
                break;
            }
        }
        if(num.length()!=16){
            throw new  InvalidCreditCardException("Error: Invalid credit card
number length.");
        }
        else if(flag==0){
          throw new  InvalidCreditCardException("Error: Invalid credit card number
format.");
        }
        else{
            System.out.println("Payment information updated successfully!");
        }
    }
    catch( InvalidCreditCardException e){
        System.out.println(e.getMessage());
    }
  }
}
```

Status : Correct **Marks : 10/10**

4. Problem Statement

Faustus is managing his bank account and wants to create a program to update his account balance based on certain conditions. However, he needs to handle specific scenarios related to invalid inputs and insufficient balances. Faustus wants to update his account balance. He inputs the current balance and the amount to be updated.

The initial account balance should be positive. If Faustus enters a negative initial balance, the program should throw an InvalidAmountException with the message "Invalid amount. Please enter a positive initial balance."If the amount to be updated is negative, the program should check if the subtraction results in a negative balance. If so, it should throw an InsufficientBalanceException with the message "Insufficient balance."If the amount to be updated is positive, it should be added to the current balance, and the new balance should be printed.

Implement a custom exception, InvalidAmountException, and InsufficientBalanceException, to manage his bank account.

Input Format

The first line of input consists of a double value 'd', representing the initial account balance.

The second line of input consists of a double value 'd1', representing the amount to be updated.

Output Format

The output is displayed in the following format:

If the validation passes, print

"Account balance updated successfully! New balance: {new_balance}"

where {new_balance} is the updated account balance.

If the initial bank amount is negative it displays

"Error: Invalid amount. Please enter a positive initial balance."

If the updated amount exceeds the initial account balance in withdrawal it displays

"Error: Insufficient balance."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1000
500
Output: Account balance updated successfully! New balance: 1500.0

Answer

```
// You are using Java
import java.util.Scanner;
class InvalidAmountException extends Exception {
    public InvalidAmountException(String message) {
        super(message);
    }
}
class InsufficientBalanceException extends Exception {
    public InsufficientBalanceException(String message) {
        super(message);
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        double balance = sc.nextDouble();
        double amount = sc.nextDouble();

        try {
            if (balance < 0) {
                throw new InvalidAmountException("Invalid amount. Please enter a
positive initial balance.");
            }

            if (amount < 0 && balance + amount < 0) {
                throw new InsufficientBalanceException("Insufficient balance.");
            }

            double newBalance = balance + amount;
            System.out.println("Account balance updated successfully! New balance:
" + newBalance);
        } catch (InvalidAmountException e) {
            System.out.println("Error: " + e.getMessage());
        } catch (InsufficientBalanceException e) {
```

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

        sc.close();
    }
}
```

Status : Correct **Marks : 10/10**