Rajalakshmi Engineering College

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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

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

```
import java.util.*;

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

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        try {
            int n = scanner.nextInt();
            validateNumber(n);
            System.out.println("Number " + n + " is positive.");
```

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

    public static void validateNumber(int n) throws
InvalidPositiveNumberException {
        if (n <= 0) {
            throw new InvalidPositiveNumberException("Invalid input. Please enter a
positive integer.");
        }
    }
}
```

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

2. Problem Statement

A company is developing a user registration system that requires users to provide valid email addresses. The development team is implementing an EmailValidator program to ensure that the entered email addresses meet certain criteria using exception handling.

The email address must contain the "@" symbol.The email address must consist of a non-empty username(before "@" symbol) and a non-empty domain(after "'@" symbol).The domain part of the email address must contain at least one period (".").The email address must not contain leading or trailing spaces.

Implement a custom exception, InvalidEmailException, to fulfill the company's requirements and validate it according to the specified rules.

Input Format

The input consists of a string value 's', which represents the email address.

Output Format

The output is displayed in the following format:

If the entered email address is valid according to the specified rules, the program prints:

"Email address is valid!"

If the entered email address misses the username or domain part or misses "@" symbol or has two or more "@" symbols or misses '.' in the domain part it outputs:

"Error: Invalid email format."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: johndoe@example.com
Output: Email address is valid!

Answer

```
import java.util.*;

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

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String email = scanner.nextLine();

        try {
            validateEmail(email);
            System.out.println("Email address is valid!");
        } catch (InvalidEmailException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }

    public static void validateEmail(String email) throws InvalidEmailException {
```

```
        if (email == null || email.trim().length() == 0 || !email.equals(email.trim())) {
            throw new InvalidEmailException("Invalid email format.");
        }

        int atCount = 0;
        for (char c : email.toCharArray()) {
            if (c == '@') atCount++;
        }


        if (atCount != 1) {
            throw new InvalidEmailException("Invalid email format.");
        }

        String[] parts = email.split("@");
        if (parts.length != 2 || parts[0].isEmpty() || parts[1].isEmpty()) {
            throw new InvalidEmailException("Invalid email format.");
        }

        // Domain part must contain at least one '.'
        if (!parts[1].contains(".")) {
            throw new InvalidEmailException("Invalid email format.");
        }
    }
}
```

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

3. 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);
    }
}

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        double balance = scanner.nextDouble();
        double deposit = scanner.nextDouble();
        double withdraw = scanner.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%n", withdraw);
            System.out.printf("Current Balance: %.1f%n", balance);

        } catch (InvalidAmountException e) {
            System.out.println("Error: " + e.getMessage());
        } catch (InsufficientFundsException e) {
            System.out.println("Error: " + e.getMessage());
        }

        scanner.close();
    }
}
```

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

4. Problem Statement

Tim was tasked with creating a user profile system that validates the user's date of birth input. The system should throw a custom exception, InvalidDateOfBirthException, if the date is not in the specified format "dd-mm-yyyy" or if it represents an invalid calendar date.

The main method takes user input, validates the date of birth, and prints whether it is valid or not.

Input Format

The input consists of a string, representing the date of birth of the user.

Output Format

The output displays one of the following results:

If the entered date of birth is valid according to the specified format, the program prints:

"[Date] is a valid date of birth"

If the entered date of birth is not valid according to the specified format, the program prints:

"Invalid date: [Date]"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 01-01-2000
Output: 01-01-2000 is a valid date of birth

Answer

```
import java.util.*;
import java.text.*;

class InvalidDateOfBirthException extends Exception {
```

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

class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        String dob = scanner.nextLine();

        try {
            validateDateOfBirth(dob);
            System.out.println(dob + " is a valid date of birth");
        } catch (InvalidDateOfBirthException e) {
            System.out.println("Invalid date: " + dob);
        }
    }

    public static void validateDateOfBirth(String dob) throws
InvalidDateOfBirthException {
        SimpleDateFormat sdf = new SimpleDateFormat("dd-MM-yyyy");
        sdf.setLenient(false);

        try {
            Date date = sdf.parse(dob);
        } catch (ParseException e) {
            throw new InvalidDateOfBirthException("Invalid date format or invalid
date");
        }
    }
}
```

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