

## Lab Task 3: Data Validation

### 6.1. Identify a scenario in your project where data validation is necessary.

In a software project, user input for age and email address needs to be validated to ensure accuracy and prevent errors.

### 6.2. Define a set of validation rules for the identified scenario.

#### 1. Age Validation:

- Age must be a non-negative integer.
- Age must be within the range of 0 to 120 years.

#### 2. Email Validation:

- Email address must follow the standard email format:
  - It should contain a local part followed by '@' symbol and a domain part.
  - The local part can contain alphanumeric characters, dots, underscores, and hyphens.
  - The domain part should contain alphanumeric characters and hyphens, separated by dots.
  - The domain must have at least two characters.

### 3.3 Implement two versions of data validation: one without applying the rules and another with the rules applied.

#### 3.3.1 Code without applying validation rules:

```
import java.util.Scanner;
```

```
public class DataValidation {  
    public static void main(String[] args) {  
        Scanner scanner = new Scanner(System.in);  
  
        System.out.print("Enter your age: ");  
        int age = scanner.nextInt();  
  
        System.out.print("Enter your email address: ");  
        String email = scanner.next();  
    }  
}
```

```
        System.out.println("Age: " + age);
        System.out.println("Email: " + email);

        scanner.close();
    }
}
```

3.3.2. Code with validation rules applied:  
package errorchecklist;

```
import java.util.Scanner;
```

```
public class User {
    private int age;
    private String email;

    public User() {
        // Default constructor
    }

    public void setAge(int age) {
        this.age = age;
    }

    public int getAge() {
        return age;
    }

    public void setEmail(String email) {
        this.email = email;
    }
}
```

```
}
```

```
public String getEmail() {  
    return email;  
}
```

```
public void validateAge(Scanner scanner) {  
    while (true) {  
        System.out.print("Enter your age (0-120): ");  
        int inputAge = scanner.nextInt();  
        if (inputAge >= 0 && inputAge <= 120) {  
            this.age = inputAge;  
            break;  
        } else {  
            System.out.println("Invalid age. Please enter a valid age.");  
        }  
    }  
}
```

```
public void validateEmail(Scanner scanner) {  
    while (true) {  
        System.out.print("Enter your email address: ");  
        String inputEmail = scanner.next();  
        if (isValidEmail(inputEmail)) {  
            this.email = inputEmail;  
            break;  
        } else {  
            System.out.println("Invalid email address. Please enter a valid email.");  
        }  
    }  
}
```

```

    }

    private boolean isValidEmail(String email) {
        return email.matches("^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\\.[a-zA-Z]{2,}$");
    }
}

```

### 3.4. Test Cases

| Test ID | Description                              | Input Data                              | Expected Outcome                                     | Actual Outcome | Status |
|---------|--|---|--|----------------|--------|
| TC-01   | Valid age input within the range         | Age: 25, Email: test@example.com        | Age: 25, Email: test@example.com                     |                |        |
| TC-02   | Age input less than 0                    | Age: -5, Email: test@example.com        | "Invalid age. Please enter a valid age." message     |                |        |
| TC-03   | Age input greater than 120               | Age: 150, Email: test@example.com       | "Invalid age. Please enter a valid age." message     |                |        |
| TC-04   | Valid email input                        | Age: 30, Email: test@example.com        | Age: 30, Email: test@example.com                     |                |        |
| TC-05   | Email input without "@" symbol           | Age: 30, Email: testexample.com         | "Invalid email address. Please enter a valid email." |                |        |
| TC-06   | Email input without domain               | Age: 30, Email: test@                   | "Invalid email address. Please enter a valid email." |                |        |
| TC-07   | Email input with invalid characters      | Age: 30, Email: test!@example.com       | "Invalid email address. Please enter a valid email." |                |        |
| TC-08   | Email input with invalid domain format   | Age: 30, Email: test@example            | "Invalid email address. Please enter a valid email." |                |        |
| TC-09   | Email input with single character domain | Age: 30, Email: test@e.com              | "Invalid email address. Please enter a valid email." |                |        |
| TC-10   | Email input with valid but long domain   | Age: 30, Email: test@verylongdomain.com | Age: 30, Email: test@verylongdomain.com              |                |        |

