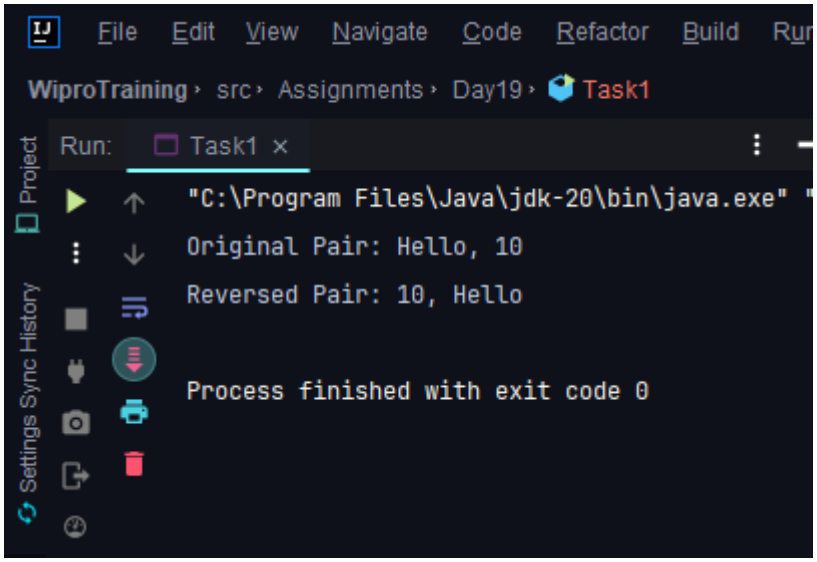
Day 19

Task 1: Generics and Type Safety
Create a generic Pair class that holds two objects of different types, and write a method to return a reversed version of the pair.

Program:

```
package Assignments.Day19;

public class Task1<S, I> {
    private final S first;
    private final I second;

    public Task1(S first, I second){
        this.first = first;
        this.second = second;
    }

    public S getFirst() {
        return first;
    }

    public I getSecond() {
        return second;
    }
    private Task1<I,S> reverseOrder(){
        return new Task1<>(second,first);
    }

    public static void main(String[] args) {
        Task1<String, Integer> originalPair = new Task1<>("Hello",10);
        Task1<Integer, String> reversedPair = originalPair.reverseOrder();

        System.out.println("Original Pair: " + originalPair.getFirst() + ", " +
originalPair.getSecond());
        System.out.println("Reversed Pair: " + reversedPair.getFirst() + ", " +
reversedPair.getSecond());
    }
}
```

Output:



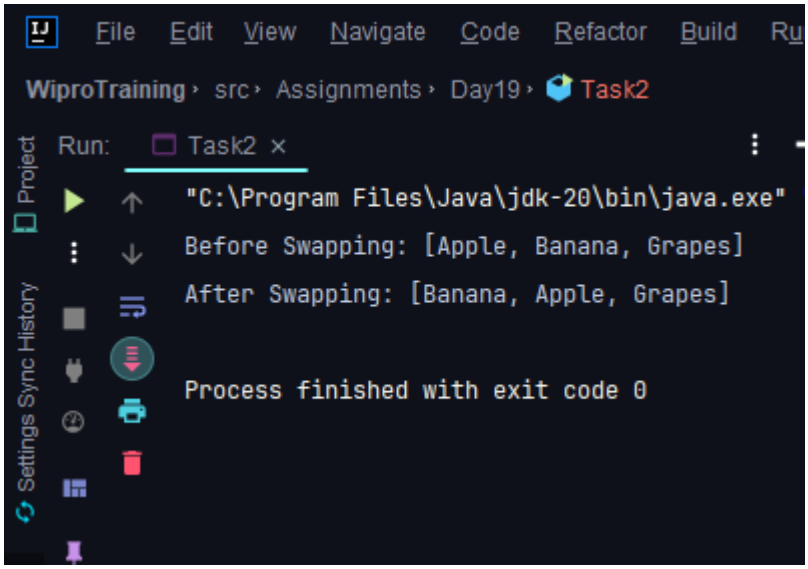
Task 2: Generic Classes and Methods

Implement a generic method that swaps the positions of two elements in an array, regardless of their type, and demonstrate its usage with different object types.

Program:

```
package Assignments.Day19;

import java.util.Arrays;


public class Task2 {

    public static <Temp> void swap(Temp[] arr, int i, int j) {
        Temp temp = arr[i];
        arr[i] = arr[j];
        arr[j] = temp;
    }

    public static void main(String[] args) {

        String [] arr = {"Apple", "Banana","Grapes"};
        System.out.println("Array:"+Arrays.toString(arr));
        swap(arr, 0, 1);
        System.out.println("After Swapping:"+Arrays.toString(arr));
    }
}
```

Output:



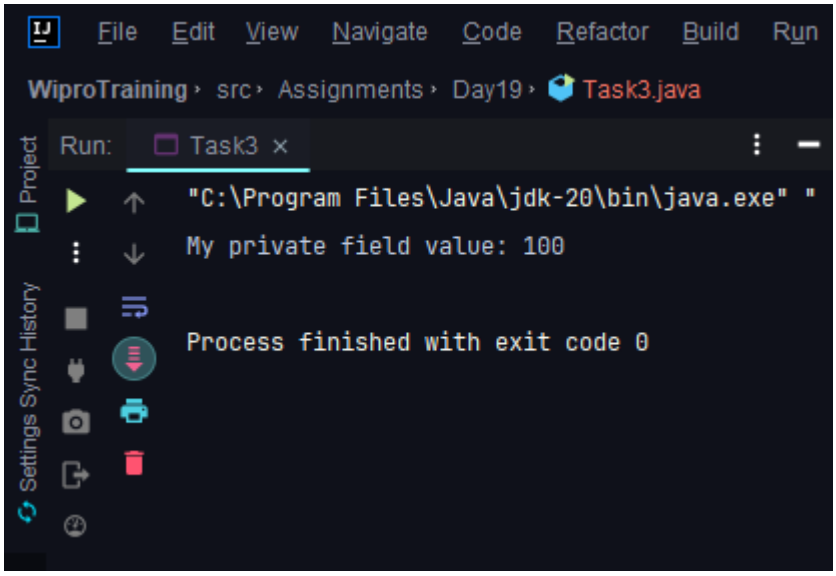
Task 3: Reflection API
Use reflection to inspect a class's methods, fields, and constructors, and modify the access level of a private field, setting its value during runtime.

Program:

```
package Assignments.Day19;
import java.lang.reflect.Field;

class MyClass {
    private int myPrivateField = 42;

    public void printValue() {
        System.out.println("My private field value: " + myPrivateField);
    }
}

public class Task3 {
    public static void main(String[] args) throws NoSuchFieldException, IllegalAccessException {
        MyClass obj = new MyClass();


        Class<?> clazz = obj.getClass();
        Field privateField = clazz.getDeclaredField("myPrivateField");

        privateField.setAccessible(true);
```

```
        // Modify the field value
        privateField.setInt(obj, 100);

        // Verify the updated value
        obj.printValue();
    }
}
```

Output:



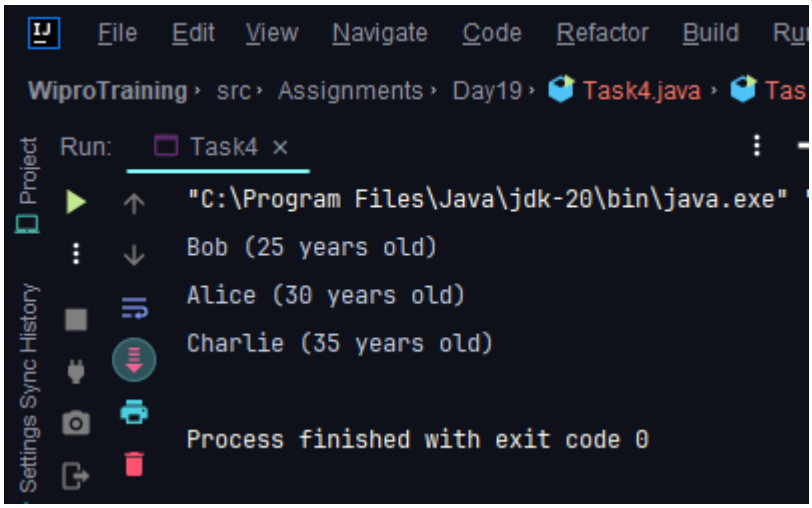
Task 4: Lambda Expressions
Implement a Comparator for a Person class using a lambda expression, and sort a list of Person objects by their age.

Pogram:

```
package Assignments.Day19;

import java.util.ArrayList;
import java.util.Comparator;
import java.util.List;

class Person {
    private final String name;
    private final int age;

    public Person(String name, int age) {
        this.name = name;
        this.age = age;
```

```
    }

    public String getName() {
        return name;
    }

    public int getAge() {
        return age;
    }
}

public class Task4 {
    public static void main(String[] args) {
        List<Person> people = new ArrayList<>();
        people.add(new Person("Alice", 30));
        people.add(new Person("Bob", 25));
        people.add(new Person("Charlie", 35));

        // Sort by age using a lambda expression
        people.sort(Comparator.comparingInt(Person :: getAge));
        // Print sorted list
        for (Person person : people) {
            System.out.println(person.getName() + " (" + person.getAge() + " years
old)");
        }
    }
}
```

Output:

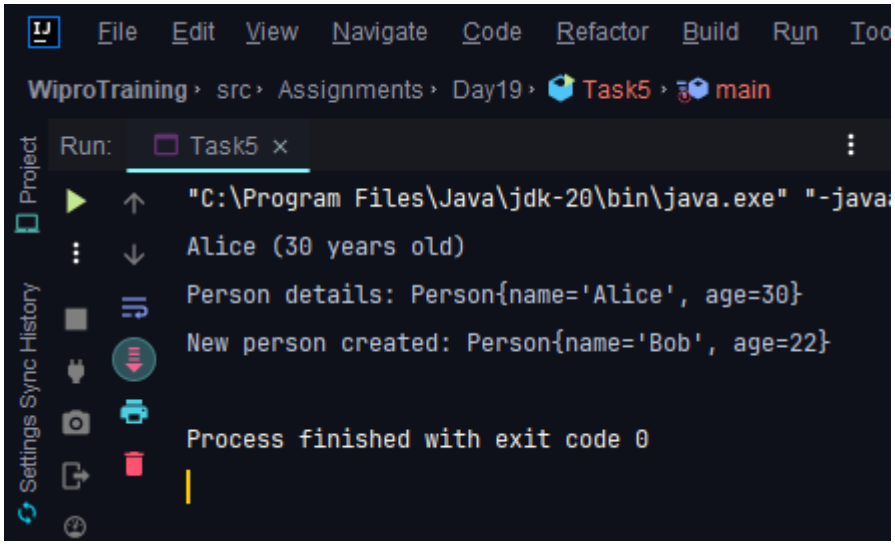


Task 5: Functional Interfaces
Create a method that accepts functions as parameters using Predicate, Function, Consumer, and Supplier interfaces to operate on a Person object.

Program

```
package Assignments.Day19;

import java.util.function.Consumer;
import java.util.function.Function;
import java.util.function.Predicate;
import java.util.function.Supplier;



public class Task5 {
    public static void main(String[] args) {

        Person person = new Person("Alice", 30);

        // Predicate: Check if the person is older than 25
        Predicate<Person> isOlderThan25 = p -> p.getAge() > 25;

        // Function: Convert a Person object to a formatted string
        Function<Person, String> personToString = p -> p.getName() + " (" +
p.getAge() + " years old)";

        // Consumer: Print the person's details
        Consumer<Person> printPersonDetails = p -> System.out.println("Person
details: " + p);

        // Supplier: Create a new Person object
        Supplier<Person> createNewPerson = () -> new Person("Bob", 22);

        // Example usage:
        if (isOlderThan25.test(person)) {
            System.out.println(personToString.apply(person));
        }

        printPersonDetails.accept(person);

        Person newPerson = createNewPerson.get();
        System.out.println("New person created: " + newPerson);
    }
}
```

Output:


File Edit View Navigate Code Refactor Build Run Too
WiproTraining › src › Assignments › Day19 › Task5 › main
Run: Task5 ×
"C:\Program Files\Java\jdk-20\bin\java.exe" "-java
Alice (30 years old)
Person details: Person{name='Alice', age=30}
New person created: Person{name='Bob', age=22}
Process finished with exit code 0
Project
Settings Sync History