

Introduction to Computer Science 2

Lab 2: Interfaces and Polymorphism

Learning Goals:

- To learn how to use interfaces.
- To learn how the principle of polymorphism allows us to write generic classes.
- To learn how to use the strategy pattern.

Exercise 1 (3 points)

A person has a name and height in centimeters. Use the implementation of the `DataSet` class for the **strategy pattern** (see slides of lecture 2) to process a collection of `Person` objects. Display the average height and the name of the tallest person.

Exercise 2 (3 points)

Define an interface `Filter` as follows:

```
public interface Filter {  
    boolean accept(Object x);  
}
```

Modify the implementation of the `DataSet` class for the **strategy pattern** (see slides of lecture 2) to use both a `Measurer` object and a `Filter` object. **Only objects that the filter accepts should be processed.** Demonstrate your modification by having a data set process a collection of bank accounts, **filtering out all accounts with balances less than 1000 euros.**

Exercise 3 (4 points)

Look up the **definition** of the **standard Comparable interface** in the Java API documentation. **Modify** the `DataSet` class **based on the Measurable interface** (see slides of Lecture 2) to **accept Comparable objects**. With this interface, it is **not longer meaningful to compute the average**. The `DataSet` class should **record the minimum and maximum data values**. Test your modified `DataSet` class by adding a **number of String objects**. The `String` class implements the `Comparable` interface.

Honor code, coding style, and deliverable:

Try to solve the exercises with what you already know. You are welcome to expand your program to do extra things but they are not mandatory.

Plagiarism is not allowed! We will run sophisticated software that automatically detects similarities on source code among students. All plagiarism incidents will be immediately reported to the Board of Examiners!

Submission!

Submit your java files to canvas.

Ask your instructor in case there is a problem with your submission.

**DO NOT SEND SUBMISSIONS VIA EMAIL
YOUR LAB WILL NOT GET GRADED!**