

# Software Development I – Exercises

## Übungen zu Softwareentwicklung 1

Winter Term 2017/2018

### Assignment 1

Name: \_\_\_\_\_ Teaching Assistant: \_\_\_\_\_

Student ID (Matr.Nr.): \_\_\_\_\_ Points (max. 24): \_\_\_\_\_

Group: ☐ G1 ☐ G2 ☐ G3 ☐ G4 ☐ G5 ☐ G6 Deadline: **Tue., October 17, 2017 22:00**

Instructor: ☐ M. Haslgrübler ☐ C. Wirth ☐ T. Forstner Editing time (hours): \_\_\_\_\_

Preferred language for comments, proposals for improvements from TA's: ☐ DE ☐ EN

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#### Problem 1: Smallest Number

2+4+4+2 points

Develop a program that determines the smallest number from an unsorted list of non-negative integer numbers based on user-input. The input should terminate if any negative number is entered.

##### Examples

```
1 2 3 -1
```

```
Smallest Number: 1
```

```
2 -1
```

```
Smallest Number: 2
```

```
4 2 3 3 1 -3
```

```
Smallest Number: 1
```

```
5 2 -9
```

```
Smallest Number: 2
```

- Describe the program in *prose*.
- Write the *flow chart* of the program.
- Write the *structure chart* of the program.
- Compare the three representations (1.a-c). Point out their individual advantages and disadvantages for this **specific exercise**.

## Problem 2: Area-Calculator

2+4+4+2 points

Write a program that can calculate the area of a rectangle respectively a square. The user first chooses for which geometric figure the area should be calculated. For calculating the area of a rectangle, the user inputs “r” or “s” for a square. Any other operation should terminate the program.

### Examples

```
Enter type of geometric figure:
r
Enter length of rectangle:
3
Enter width of rectangle:
2
Area of rectangle: 6

Enter type of geometric figure:
s
Enter length of square:
2
Area of the square: 4

Enter type of geometric figure: t
Type of geometric figure not implemented.
```

- Describe the program in *prose*.
- Write the *flow chart* of the program.
- Try to implement the program in Java language. (Don't take care of exception handling. Use the method “Input.readInt()” and “Input.readChar()” provided in our “Input.java”.)
- What are the advantages and disadvantages of the Java program compared to the other forms of representations (prose, flow chart)? Explain verbally.

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**Hints (for flow- and structure-charts):** For the input and output please use the following notation.

- Use `read(↑number)` to read one input number (from the user, no data type to be specified).
- To output a variable with the name “result” use `write(↓result)`.
- To output text use `write(↓"This is the output text")`.

**Hand-in of assignment A01:** Handed-in electronically using the submission system at the course homepage. Make sure that your submission conforms to the style guidelines available at [https://www.pervasive.jku.at/Teaching/\\_2017WS/Softwareentwicklung1/Stil- und Abgaberrichtlinien.php](https://www.pervasive.jku.at/Teaching/_2017WS/Softwareentwicklung1/Stil- und Abgaberrichtlinien.php)