

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

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

- a) Describe the program in *prose*.
- b) Write the *flow chart* of the program.
- c) Write the *structure chart* of the program.
- d) 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.
```

- a) Describe the program in *prose*.
- b) Write the *flow chart* of the program.
- c) 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”.
- d) What are the advantages and disadvantages of the Java program compared to the other forms of representations (prose, flow chart)? Explain verbally.

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 Abgaberichtlinien.php