Distributed Systems
Exercise Sheet 4, Tuesday, 16:00
Klingemann, SS 2023

Deadline: 23rd May 2023

1st Assessed Exercise

1. Communication via Sockets
Understand the example code and test the programs. Client and server can run on the same machine.
Hint: You can address your own machine using the name `localhost`.

2. Realize a remote method invocation by using plain sockets (without any middleware)
Use TCP-sockets for this task.
Extend the client and server so that the client can invoke methods on the server and a corresponding return value is delivered to the client.
Therefore, you have to extend your system for the management of wardrobes and their content from Sheet 3. Use two wardrobe-objects on the server. Objects of the classes wardrobe and piece of clothing only exist on the server and must not be used on the client.
The client should be able to invoke three different methods on the wardrobe-objects. The first method is the adding of a new piece of clothing-object. The client provides the server with the values of the three attributes and gets an acknowledgement as a reply. The second method is the query for the categories of all piece of clothing-objects of the wardrobe (an additional method of the class wardrobe). The third method returns the name of the wardrobe.
The client has to offer the possibility to choose a wardrobe-object and call one of the three methods. Hence, to solve this task, you have to transport the information about the object, the method and the corresponding parameters by means of sockets. Similarly, you have to transport the return-value. Solve this task by encoding all the different pieces of information that are necessary for the method invocation within a single integer value. This integer is then transported using TCP-sockets. Allow for category, colour and size ten different alternatives, each. Create a mapping to a number for each of them (e.g., trouser is represented as 0, shirt is represented as 1, etc.).

Organisatorical matters

- You have to solve the exercise completely on your own! (No working in groups!)
- It is necessary but not sufficient to present a working program. Moreover, you have to be able to explain all parts of your program, be able to answer questions with respect to your program and make small extensions of you program.
- Your program has to be created completely within the exercise slot.
- If you violate one of the rules above, this implies that you definitely fail in this exercise.
- You can only present solutions that correspond to the exercise slot you are assigned to.
- It is in your responsibility to present your solution in time before the deadline. The assessment of your solution can only be guaranteed if you finish your program 60 minutes before the end of the exercises.
- To take part in the exam it is required to solve at least three of five assessed exercise sheets.