

In the last course evaluations, students wished for more hands-on programming of networking concepts and tools. Over the course of the quarter, we will have several exercises that will require familiarity with basic programming skills. This first exercise sheet will help you brush up on those skills after the summer break.

In this exercise, you will develop a simple bulletin board server that allows clients to search for housing. For this beginning exercise, you can use *any* high-level language (choice of Java, Python, or C - later exercises will be in Java), however you must *not* make use of any libraries and must base your implementation on the sockets provided by your chosen language. It is also *not* permissible to copy and/or reuse source code by someone else or found online, i.e., the solution must be entirely your own.

You can turn in your solution electronically at <http://www-nas.et.tudelft.nl:8080/AdvancesNetworking/>. Only the source code should be uploaded (as a zip file). The main file should be called `HousingServer.java` [/.c/.rb]. This homework is worth 3.5 points, 1.5 extra credit points can be earned by finishing section 2. Please submit your final version that will cover all questions that you have worked on.<sup>1</sup>

## Section 1. Housing Bulletin Board

1. In September, finding housing in Delft is difficult - many students are looking for a room and it is not easy to get an overview what is available. To help this, we are implementing a little housing bulletin board application where landlords can post offers and students can see the available rooms. In order to participate, users connect to the IP address of the computer where your program is running and the port number 5000. They establish a session and are greeted by your housing server. The server asks whether they look for a room or would like to share a room. Once the user replies to this, s/he is recognized as a renter or landlord and admitted to the system. [See blackboard for an example output.] (2 pt)
2. If you entered the system as a landlord, you can submit your offering using the keyword “POST” at the beginning of the line. There’s no specific form to an ad, the entire text after the keyword “POST” will be used. The exact same ad can only be posted once. If you entered the system as a renter, the command “SHOW” will list all available ads in reverse-chronological order. (1 pt)
3. Users will have the opportunity to contact landlords. By sending the keyword “CONTACT” and specifying the ad they are referring to (choose a good way for doing this yourself), they can send a message to the poster of the ad. The message will be internally “attached” to the room posting (but in this “warm-up” nothing further happen for now). (0.5 pt)

## Section 2. Extra Credit

4. There may be times when users are absent and not connected to the housing server. When you return and look for rooms again, you do not want to see all listings, just the ones that have been entered since your last visit. So that users do not miss new openings, the housing server will maintain a history of what happened in the meanwhile. Once a user returns and connects again to the chat server, the server will greet the user, tell him how long s/he was away and display all new posts that this user has not seen during this period. After these messages were displayed, the chat server will enter the “regular” mode. In this warm-up, we will identify users only by their IP address. (0.75 pt)
5. Now we also consider the delivery of the messages, if a person logs in all new messages for that user will be displayed. Users can read, delete and reply to messages they got (choose a way of how to address a person). (0.75 pt)

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<sup>1</sup>This assignment may look more difficult than it actually is, my reference solution for Q1 in Java is less than 30 lines long.

Example of how the interaction with the bulletin board *could* look like:  
(Your program does not have to match this, it can work different)

```
C:\> telnet localhost 5000
```

```
> Welcome to the housing bulletin board.
```

```
> Press 1 if you would like to post an offer. Press 2 to see the available listings.
```

```
2
```

```
> You have chosen to enter the system as a renter.
```

```
> Type SHOW to display all current offers. Each offer has an offer number, the
```

```
> keyword CONTACT allows you to contact the poster of an offer.
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```
> What would you like to do?
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```