Computer Science 2B

Practical Assignment 00

2024-07-16

Deadline: 2024-07-23 12h00 Marks: 70

This practical assignment must be uploaded to eve.uj.ac.za **before** 2024-07-23 12h00. Late or incorrect submissions **will not be accepted**, and will therefore not be marked. You are **not allowed to collaborate** with any other student.

Make use of proper coding conventions and documentation. Marks will be deducted if these are not present. Your submission should include a batch file.

The reminder page includes details for submission and queries. Please ensure that **ALL** submissions follow the guidelines. The reminder page can be found on the last page of this practical - read the reminder page carefully.

This practical will focus on creating basic socket connections and querying connection information.

Create a Java application that will test for open port numbers and display the current computer's IP address (not the loopback address). Create a socket connection to the **localhost** of the machine to test the connection for port numbers between 1 and 65535. Your application should test if a connection is possible with **every third** port number starting from 1. The moment a successful connection is made, additional information about the socket should be displayed.

An example of the command line output should be:

```
Could not connect to localhost port: 1
Could not connect to localhost port: 4
...
Program connected to localhost port: 25
Local port of the connection: 51344
Remote port of the connection: 25
Could not connect to localhost port: 28
...

The computer IP Address is: 152.106.59.111
```

Bonus

Create a JavaFX Graphical User Interface (GUI) for your application. You may use any GUI elements that would allow for the effective launch and display of information required by the program.

Marksheet

1. Display IP Address (**Hint** - It is not 127.0.0.1 or localhost) [10]
2. Create a Socket Connection. [5]
3. Display port numbers' connection status. [10]
4. Display local and remote ends of established connections. [5]
5. Error handling. [5]
6. Coding convention (structure, layout, OO design). [5]
7. Commenting (normal and JavaDoc commenting). [5]
8. Correct execution (if it doesn't run from your batch file you get 0). [25]
9. JavaFX GUI. [10 (bonus)]

NB

Submissions which **do not compile** will be capped at 40%

The awarding of marks is dependent on the student's ability to effectively justify and demonstrate understanding of the practical work presented.

Execution marks are awarded for a correctly functioning application and not for having some related code.

Reminder

Your submission must follow the naming convention as set out in the general learning guide:

`SURNAME_INITIALS_STUDENTNUMBER_SUBJECTCODE_YEAR_PRACTICALNUMBER`

Your submission must include the following folders:

- `bin` - *(Required)* - Should be empty at submission but will contain runnable binaries when your submission is compiled.
- `docs`- *(Required)* - Contains the batch file to compile your solution, and any additional documentation files. All documentation files must be in **PDF** format. Your details must be included at the top of any **PDF** files submitted. **Do not include generated JavaDoc.**
- `src`- *(Required)* - Contains all relevant source code. Source code must be placed in relevant sub-packages! Your details must be included at the top of the source code.
- `data` - *(Optional)* Contains all data files needed to run your solution.
- `lib` - *(Optional)* Contains all libraries needed to compile and run your solution.

Every submission **must** include a batch file that contains commands which will:

- Compile your Java application source code.
- Compile associated application JavaDoc.
- Run the application.

Do not include generated JavaDoc in your submission. All of the classes/methods which were created/updated need to have JavaDoc comments.

Note that only **one** main submission is marked. If you have already submitted once and want to upload a newer version, then submit a newer file with the same name as the uploaded file in order to overwrite it.

Bonus submissions should be uploaded separately and clearly named as the bonus submission - which will then be marked accordingly.

It is important to make use of **each practical opportunity** as preparation for the practical semester test (ST2). The practical assignments also contribute to the **Practical Component Mark** (PCM). There will be 9 practical assignments (P00-P08) this semester which will be released on a weekly basis except when tests are being written.

The process to **query** your practical assignment with an assistant is discussed in the learning guide as well as the first practical lecture.