F27SB Software Development 2

OOP Coursework 2: Networks

Upcasting and Downcasting

Assume we have 4 classes:

1. **Person**
2. **Teacher**
3. **Student**
4. **PhDStudent**

Teacher and **Student** are both subclasses of **Person**. **PhDStudent** is a subclass of **Student**.

1. Draw a class inheritance tree using your favourite drawing programme or a piece of paper and a pen. Make sure that you follow all conventions discussed in the lecture. You will need to present and explain this to the lab helper to get your mark. **Please, upload the drawing to Canvas after you have been marked.**

   (Correct structure: 0.25P,
   Correct type of arrows: 0.25P)

2. Which of the following assignments are legal, and why or why not? Write down your explanations so you can read and show them to the lab helper during the marking session. **Please, upload the written answers to Canvas after you have been marked.**

   a) `Person p1 = new Student();`

   b) `PhDStudent phd1 = new Student();`

   (0.25P per correct answer: 0.5P)

3. Implement the class structure in Java and confirm that your answers in 2. are correct. Show the implementation to a lab helper to get it marked. **Please, upload the code to Canvas after you have been marked.**

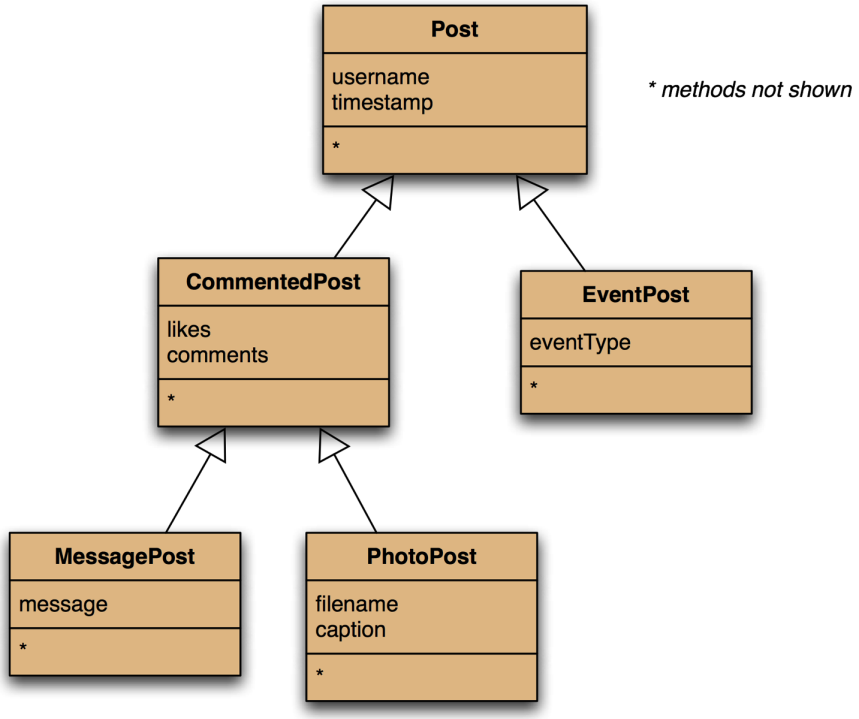
   (Correct structure: 0.5P,
   Confirmed answers: 0.5P)

Introducing Deeper Hierarchies

Using the source code provided, implement two new classes: **`EventPost`** and **`CommentedPost`,** and refactor the code to reflect the following inheritance hierarchy. After refactoring, create a new instance of EventPost in the `StartNetwork.java` file and add it to `news`. Make sure that your EventPost

with all its content according to the diagram is printed when you run the network.

The method names have been omitted in the diagram. Think: which methods should go where so that the output looks similar to before? Avoid code duplication and use dynamic method lookup. No **`public`** or **`protected`** variables are allowed. If eclipse tells you to change the visibility of a variable, it just means that you haven't implemented it correctly, yet.



(Created CommentedPost: 0.25P,
Created EventPost: 0.25P,
Correctly moved variables and methods: 0.5P,
Correctly implemented all display methods: 1P)

Marking

In each coursework, you can achieve a total of 4 points. Each question awards different amounts of points for different parts of the question. Partial completion of a task will award the partial points listed underneath. Most descriptors of points are self-explanatory in context of the task. Where further clarification is needed, you can find that below.

Your work will be checked by a lab helper during your assigned lab slot. Once all tasks are checked, the points will be used to calculate your marks. Please, understand that the lab helpers are not marking your work but are checking the completion of subtasks. As part of this check, you will need to explain how you solved the given task. **Only successfully completed sub-tasks will award points.**

The marks will be released on Canvas after the marking deadline has passed. This is not an automatic process so please, be patient. Once the marks are released, you will be notified via Canvas. Please, **make sure to check your marks as soon as possible**. If there are any issues, please contact your teaching team immediately.

Collusion and Plagiarism

As mentioned above, you will need to explain your work during the demo session in the lab. If you are not able to explain how you arrived at the solution to the task, we need to assume that you did not do the work yourself. We do, however, know that you might be anxious or nervous during the session. Please, rest assured that this is not an interrogation and you can take all the time you need to explain your solution.

If there is reasonable doubt that you solved the given problems yourself, you will not get any points for this task. If there are concrete indications that you copied your answer or colluded with other students, we might also start an official investigation.

Please, make sure to fill and sign the Declaration of Student Authorship form for each coursework and upload it to Canvas. If you do not upload the form, we will not be able to give you any marks for this coursework.

If you feel unjustly accused of plagiarism or collusion, please contact your teaching team.

Coursework submission

Unless stated otherwise, all code parts of your work need to be committed and pushed to your GitLab fork. You need to upload the Declaration of Student Authorship to Canvas, and you need to present your solution to a lab helper. If you fail to do any one of these steps, you will not be awarded any marks.

The deadline for submission can be seen on Canvas. You will need to **present your work to a lab helper any time before the deadline during your allocated lab slot**. If you do not manage to present your work before the deadline, you can do so at the first lab after the deadline but will incur a 30% late penalty. If this late submission was caused by issues out with your control, you can apply for mitigating circumstances to have this late penalty removed.

If you also fail to present your work at the lab following the deadline, we will not be able to give you any marks for your work. Similarly, if this was caused by circumstances out with your control, you should apply for Mitigating Circumstances.
Please, note that we are not allowed to give individual extensions. If you cannot submit your work on time, you will need to apply for Mitigating Circumstances.