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**Phase:** 4 (In the other words, how many points this project is worth of.)

**Design solution:**

I create separate classes for each case. There are several methods in Onlog.class didn’t show in UML diagrams, those are used by quicksort method.

UML diagrams show as below:

**Diagram

Description automatically generated**

**Diagram

Description automatically generated**

**Testing:**

There are 4 pictures for this project. Those pictures can show my solution is meet needs.

Text

Description automatically generated

picture 1

Text

Description automatically generated

picture 2

Text

Description automatically generated

picture 3

**Text

Description automatically generated**

picture 4

**Work hour bookkeeping:**

|  |  |  |
| --- | --- | --- |
| **date** | **hours** | **worked with** |
| 29.11.2022 midnight | 3 | Accomplish App.class and frist two phase.  I was work with my machine learning project that takes long time to tarin the model. So I start to do this assignment. |
| 29.11.2022 | 2 | Keep modify main class. Complete phase 3 and 4. |
| 29.11.2022 | 2 | Writing report, recording proof and solve git issues. |

**Git repository link:**

<https://gitlab.tamk.cloud/dtxiwu/pl3final.git>

I test it by myself, it works fine at IntelliJ IDE.