NHL STENDEN hogeschool

STUDENT NAME		STUDY PROGRAMME	**Information Technology**
STUDENT NUMBER			

Test bane	Object Oriented Programming
Subject code	
Test date	
Test time	
Examiners	
Test duration	180 minutes
Number of exercises/questions	5
☐ Answer form ☐ Answer sheet ☐ Writing paper ☐ On the test itself ☒ Git repository	

Maximum attainable points	100
Number of points with which the test was passed	55

Permitted aids

☐ none	☐ textbook	☒ calculator	☐
☒ draft paper	☐ law book	☐ graphics calculator	☐
☐ graph paper	☐ dictionary		☐

General test instructions:
- Write your details clearly and correctly in your repository (README.md). Also add this PDF in your repository.
- Warn the invigilator if something is unclear about the test.
- Delete the exam from your PC when finishing up your exam.

If, during the test, you have a complaint about the contents of the test or about how the test is held, you must submit your complaint in writing within 2 working days to the relevant Examination Committee.

My school can trust the fact that I took this test independently without the help of others and that I have only used the tools and aids that the examiner has allowed me to do.

Standards:	Class diagram	0-100 Points	40%	
	Code Conventions	0-100 Points		Both parts must be completed with a passing grade.
	Code Quality	0-100 Points	60%	
	Testing	0-0 Points		

CASE LOCK AND LOAD

NHL Stenden offers special lockers in which you can charge your laptop. This way you are always sure you have a fully charged laptop. You should write a software application that manages the lockers.

A laptop contains a serial number. The serial number consists of numbers and letters. Besides that, the laptop contains the current amount of mAh (milliampere-hour). You can provide this value in the constructor. The laptop also has a maximum amount of mAh (when the laptop is fully charged). This value differs per laptop and can also be provided. Based on this value you can calculate the battery percentage.

The laptop can be put in a locker. The locker has - besides an optional laptop - a locker number.

A locker block consists of multiple lockers. The number of lockers within a block are undetermined: more lockers can always be added.

ASSIGNMENT 1
First, make the class diagram based on the text above and the assignments below.

ASSIGNMENT 2.1
Based on your created class diagram, create the software and work out the assignments below.

ASSIGNMENT 2.2
Create a method in the locker block so you can put a laptop inside a locker. The locker will be selected based on it's locker number. **Be aware**! Only one laptop fits within a locker.

ASSIGNMENT 2.3
Create a method which returns a list with all available lockers within a locker block (so don't print to screen!).

ASSIGNMENT 2.4
Create a method within the locker block that returns the first available locker. Keep the following in mind:
- When a locker is empty it is available and should be returned.
- If all lockers are full the following conditions apply:
  - The locker with a laptop with the highest battery percentage will be released first.
  - If there are two laptops with the same battery percentage, the locker that contains the laptop with the most current mAh will be released first.

ASSIGNMENT 2.5

The locker block itself has a charger of 522 mAh. Make a method that returns how many hours it takes to fully charge all the laptops. *Keep in mind that some laptops are already partly charged.* Use the following calculation:

$$H \ = \ T \ / \ C$$

H = Total amount of hours to fully charged
T = Total of remaining mAh to fully charged
C = mAh of the lockers block charger