Exam in PGR103 V2021

24h home exam

Pass/Fail

Important information:

The assignments in the exam cover a wide range of learning objectives in the course. It is therefore important that you try to answer all the questions. You can use pseudo-code to describe how you try to solve a code problem, but it counts less compared to working code. The code tasks must be solved in Java.

Read through the entire assignment before you begin.

Remember to deliver well in advance. It is very annoying not to pass because you just missed the deadline… What is to be delivered is described later in the assignment.

Background

An English gym teacher at a primary school in Norway has become very tired of not having control over the sports equipment used in teaching. She therefore plans to get this sorted out. The project is underway. Initially, she has given priority to gaining control of balls and table tennis rackets. These are constantly disappearing, and they need some maintenance. Balls constantly need to be refilled with air, and the table tennis rackets need to have the coating on the outside of the racket changed. It is planned to incorporate several types of sports equipment over time.

She has now given all balls and table tennis rackets a unique ID (drawn directly on the ball / racket). She has also had some cupboards installed where these are to be stored. She has made a list (equipment.txt) that contains information about all the sports equipment (balls and table tennis rackets). The sports equipment in the gym teacher's system has a number of common features:

- A unique ID
- A location that indicates where the equipment is stored
- Information about equipment that needs to be replaced.

For balls, she wants to store the type of ball in question (foot, hand, basketball or volleyball). She also wants to know if the ball needs to be refilled with more air - that is, needs to be inflated.

For table tennis rackets, she wants to know if the racket needs to change coating.

As you can see from the inventory list (equipment.txt), all this information is now registered in a file. An explanation of the contents of the file can be found in Appendix 1.

Task 1

Create a class that is responsible for reading equipment information from a file. When reading from a file, objects representing the balls and table tennis rackets must be created. The class should include a public method that can return the objects read from file. You have to figure out for yourself which classes you need to create in order to represent the balls and the table tennis rackets. It is expected that you use inheritance.

You will need this method that returns the objects (read from file) in the next task. If you were not able to create objects based on the information in the file, then you should create a new method that creates equipment objects without loading information from the file. In that case, keep your code where you tried to read from the file.

Task 2

Write a few words about how you can test whether the method that returns the objects in problem 1 works as intended.

Task 3

Write a class with 3 public methods:

- *printBallsNeedingMoreAir*: The method should print information about which balls need to be inflated.
- *printEquipmentNeedingToBeReplaced*: The method should print information about which equipment needs to be replaced.
- *printTableTennisRacketsNeedingNewPad*: The method should print out which table tennis rackets need to change coating.

The methods should use the objects read from file to perform their action. It is therefore expected that you use the class you created in problem 1 to read in information about the equipment before the methods are called.

Task 4

Create a program that tests whether the class you created in Exercise 3 works as intended. The program will call on all the three methods described in task 3.

What will be delivered

All source code in your project (ie all .java files).

A text document that answers task 2.

A screenshot of the result when you run your program (Exercise 4).

Good Luck!

Apendix 1

Her er et *utdrag* fra equipment.txt med forklaring til de ulike linjene i filen:

Ball --> Hva slags type utstyr, i dette tilfellet er det snakk om en ball.

12 --> Id

Locker 1 --> Hvor dette utstyret skal oppbevares

false --> Om ballen må skiftes ut

Football --> Hva slags type ball

true --> Om ballen trenger mer luft

TableTennisRacket --> Hva slags type utstyr, i dette tilfellet er det snakk om en bordtennisracket.

16 --> Id

Locker 5 --> Hvor dette utstyret skal oppbevares

false --> Om bordtennisracketen må skiftes ut

false --> Om bordtennisracketen trenger nytt belegg