CSE102L Computer Programming Quiz 2

Disclosure

You will submit your file to an assignment that is given through MS Teams. Your filename should be **Q1_{yourStudentNumber}.java**. Quiz will start at 09:15 you will have an hour to code then you will be given extra 15 minute to finalize the upload process. Your code will be checked with plagiarism tools, any kind of code sharing and using the internet is forbidden.

Objective

We would like you to determine the necessary components yourself, and design according to the requirements that you detected. You may write any methods, attributes, or classes that you think would be necessary to complete the quiz. This quiz is mainly about abstract classes, interfaces, generics, data structures and sets and maps. Think about different ways of using these concepts in this quiz.

Specifications

Two types of products are produced in an electronics manufacturing facility. Each type of product has a model name (will be given), date of manufacture, a unique serial number (random number, must be unique), maximum durability(60 for CPU, 80 for GPU) and a number denoting its durability (set to 0). In addition to this information, the graphics card product, which is one of the two products, has specs such as memory type (String), memory size (int) and number of cores (int). On the other hand, the processor product has specs such as cache size (int) and frequency (double).

The specs of the products to be produced will be determined from given queues to two production lines. You can think of these queues as customer orders. These orders will be in the form of model names. According to provided model names, products with set of specific specs will be produced. Given product name must be one of the models that can be produced by that production line (see the following paragraphs for the names of products that can be manufactured in each production line). An example to single item to be produce in graphics card production line is given below:

{model name: “GTX980” : [memory type: “DDR4”, memory size: 4, cores: 8]}

There are two professions working in this manufacturing facility. Each employee in this facility has name, surname, and a unique registration number (random number, must be unique). Quality assurance specialists, who are one of the professions working in this facility. They can test both types of products (Tip: generic method) according to their durability and determine a quality score out of 100% for the relevant product. If the quality score is higher than 85%, they stack the products in a warehouse to be shipped to shops for selling. If it is less than 85% they add another order to queue that will be produced with the same model name.

Another profession working in this facility are Engineers. In addition to what each employee has, the members of this profession also have experience years information. Engineers works on products in production lines. For each of the engineer working on a product in a production line, the products durability will increase x2 of the engineer’s work experience. Hired engineers has the capability of working on each of the product type however, they will be assigned to one type of product (Tip: generic

class). Engineers can be hired and assigned to a production line by a Chief engineer. Each of the chief engineers are only responsible from one production line that produces one of the product types. They can hire or fire engineers who are working in the production line that they are responsible of.

There are two production lines in this facility. In one of the lines graphics cards are being produced, and in the other one processors are being produced. In the graphics card production line there can be four different models that can be manufactured. Their names are “GTX980, GTX1080, GTX2080, GTX3080”. Customer orders with the given model name to the production line can be read through a queue and according to the name of model name, a graphic card with its specs predetermined can be manufactured. (How can you represent these specs with different data types are bonus point). In the processor production line, there can be four different models that can be manufactured. Their names are "i31220PE, i512600HX, i712700K, i912900E". Just like producing graphics cards, while producing processors, processor production line reads a queue and manufactures products according to given model name.

Summary

There are two product types, GPUs and CPUs. They are being manufactured in their corresponding production lines. In each production line 8 engineers are working, and engineers contribute to product with increasing its durability according to their work experience. Production lines takes customer orders and according to model names in customer orders they manufacture products(GPUs and CPUs) with specs of that product. Produced products are than sent to specialists who score the products’ quality according to its’ durability. Products with more than %85 quality are stored.

Lastly, find how many products have been produced by each model. (Tip: Use iterator to pop the elements from the stack, store each popped manufactured product’s serial number and its model name in a map. Swap the key-value pair. Count the number of elements in each set)