

### Question 3 (3 marks)

Define a **Electronic** class with the following information:

<b>Electronic</b>
-code:String -name:String -brand:String -price:long
+ <b>Electronic</b> () + <b>Electronic</b> (code:String, name:String, brand:String, price:long) +getCode():String +getName():String +getBrand():String +getPrice():long +setCode(code:String):void +setName (name:String):void +setBrand(brand:String):void +setPrice(price:long):void

Where:

- getCode():String – return code.
- getName():String – return name.
- getBrand():String – return brand.
- getPrice():long – return price.
- setCode(code:String): void – update code.
- setName(name:String): void – update name.
- setBrand(brand:String): void – update brand.
- setPrice(price:long): void – update price.

Create a **ListOfElectronic** class extending from **HashMap<Key, Value>** class in java collection. (*in which: Key: will be used to store code of electronic and Values store **Electronic** objects*).

<b>ListOfElectronic</b>
+toList():List< <b>Electronic</b> >  +addElement( <b>Electronic</b> e):void  +filterByPrice(long min, long max):List<Electronic>  +countByBrand(String prefix):int

Where:

- **toList**() : List<Electronic> – return a list of Electronic objects.
- **addElement**(Electronic e):void – add one Electronic object in the values list.
- **filterByPrice**(long min, long mx): List<Electronic> – prints all of electronic objects which has price in range min and max value depend on arguments of this method
- **countByBrand**(String prefix):int – count all electronic products of the brand with the filter condition based on the first characters of the brand's electronic.

When running, the program will add some data to the list. Sample output might look something like:

Added some Electronic info 1- Filter by Price 2- Count by Brand 1 Enter min range: 5000000 Enter max range: 10000000 OUTPUT: Loa Bluetooth-Sony-8500000 Loa Bluetooth-Samsung-9200000	Added some Electronic info 1- Filter by Price 2- Count by Brand 2 Enter Brand name: Sony OUTPUT: 3	Added some Electronic info 1- Filter by Price 2- Count by Brand 2 Enter Brand name: pana OUTPUT: 6
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## PRO192 PE INSTRUCTIONS

Read the instructions below carefully before start coding.

**Students are ONLY allowed to use:**

- Materials on his/her computer (including JDK, NetBeans, Window explorer, Winrar, Winzip).
- For distance learning: Google Meet, Hangout (for Exam Monitoring Purpose).

**Follow the steps below to complete PE:**

1. Create a folder to save given projects, e.g. PRO\_given (1). Down load given materials to (1).
2. Steps to do question 1 (do the same for other questions): Open NetBeans, open the given Q1 project, then complete it according to the requirements in the exam. (Do not: delete given files, or create java file with the same name as given files).
3. Before submission: Run the function "**Clean and Build Project**" (Shift+F11), then rename the folder dist to RUN (or run). (If the folder RUN already exists, delete it before renaming).
4. **Submission:** to submit the project Q1, at first you must select Question No = 1, browse and select the project folder (e.g. 1, Q1 or Q1X,...) then click the **Submit** button. Do the same for other questions. **Do not submit** the un-edited given project.
5. **Do not use accented Vietnamese** when writing comments in programs.
6. Software tools must be used: **NetBeans IDE** and **Java JDK 1.8**.

**If at least one of the above requirements is not followed, the exam will get ZERO.**

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**Trouble shooting:**

If the given project (e.g. Q1) runs with error, you need to run "Clean and Build Project" (Shift+F11).

If still error, try to rename the project, e.g. from Q1 to Q1X or Q1Y,...

If the size of the project is too large for submission, try to delete the folder "build".

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