# ATHENS UNIVERSITY OF ECONOMICS AND BUSSINESS

**COMPUTER SCIENCE DEPARTMENT**

## Computer Programming withJava

**Spring semester2019-20**

**An electrical appliance store sells three main categories of appliances: picture & sound, gaming and home appliances. The image & sound category includes televisions, blue ray/ DVD players and cameras. The gaming category includes consoles and portable consoles. The household appliances category includes refrigerators and washing machines. Common features of all device types are: code, model name, model year, manufacturer and price.**

**Apart from the common features, each type of device has additional features which are listed below:**

| | |
|---|---|
| **Televisions** | **type (LCD, LED, Plasma), screen size, resolution, ports (HDMI, DVI, Composite)** |
| **Blue ray/DVD players** | **Type (Blue ray or DVD), resolution, playback format (BD-R, BD-RD, DVD-RW, DVD+RW)** |
| **Cameras** | **type (compact, DSLR, Action camera), megapixel, optical zoom, digitalzoom, screen size** |
| **Consoles/portables consoles** | **type (PS4, PS3, Xbox), processor, graphics, sound, capacity hard disk** |
| **Refrigerators** | **type (single door, two door,closet), energetic class, storage capacity, freezing capacity** |
| **Washing machine** | **energy class, capacity, revolutions** |

**The store offers discounts, which are common to all devices belonging to the same basic category, e.g.25% off video & audio devices, 10% off gaming devices and 20% off home devices.**

**The store maintains a list of devices it has for sale, a list of devices ordered, and a list of devices it has sold. The list of available devices, in addition to the characteristics of the devices, also includes the number of pieces of each device model that is immediately available in the store (so it does not need to be ordered when a customer requests it).**

**Characteristics of an order are the order code (which is unique and serial number), the device model ordered, the customer's name and telephone number, the date of the order, the expected date of arrival of the order, the final cost and the status of the order (expected or executed). Characteristics of a sale are the sale code (which is unique and serial number), the device model sold, the customer's name and phone number, the date of sale and the final cost. Order and sales codes are independent.**

**Requirements:**

**A) Create the necessary classes of a hierarchy to describe the devices that has the store. Design and implement the class hierarchy so that:**

- **Maximize code reuse.**
- **To gather common characteristics of classes as high up in the hierarchy as possible. Take**
- **advantage of polymorphism in calling common methods.**
- **Declare the methodsget and set required to access the variables of classes.**

**B) Design and implement the "order" and "sale" classes. The specific classes include a reference to the device ordered/sold and the other details mentioned in the description above.**

**C) You implement three collections for the list of available devices, the list of devices that have been ordered and the list of devices that have been sold. The list of available devices should have exactly one instance of each device model. The list of orders should include items of type "order", and the list of sales should include items of type "sale". To implement collections use or extend appropriate collection from packagejava.util.**

**D) Write a program in Java that initializes the three directories: the directory of of available devices with at least two models for each type of device (televisions, cameras, refrigerators, etc.), and the lists of orders and sales with a gap. In addition, the program should have a rudimentary command line interface (command line) with the following capabilities, via a numbered list of options:**

- **The home screen gives the options to view all available devices, view all orders, view all sales, and exit the program. E.g.0=device overview, 1=order overview, etc.**

- **The overview of available devices option prompts the user to first select the category (audio and video,gaming or home appliances), then the type device (TVs, refrigerators, etc.) and finally the specific model. After selecting the model, its characteristics should be printed.**
- **When the features of a device model are displayed, give the option to sell the model if there are parts of that model available in the store. If it is not available, give the option to order the model. If the sale can be made, ask the user to enter the remaining details of a sale, and calculate the final cost taking the discount into account. The sale is completed by updating the available parts of the model, assigning a sales code (next available number) and entering it in the sales catalog. After completing the sale, return to the home screen.**

- **In the order option, ask the user to enter the remaining details of an order. The order is completed by calculating the final cost taking into account the discount, assigning an order code (next available number) and entering it in the list of orders. After completing the order, return to the home screen.**

- **After selecting order overview, allow the user to select a specific order. After selecting a specific order, print the order details and select order arrival &**

**sale. This option updates the order status, assigns a sales code, and registers the sale in the sales list. Then it returns to the home screen.**

**Suggestions:**

- **When an object is requested to be printed (eg, in printing the attributes of a product), this should be done by overriding thetoString().**
- **When an attribute has few options, use static final variables for the possible options. For example, its "type" variableBlue ray/DVD players should take BLUE_RAY or DVD values, which should be static and final variables.**

**Date of announcement:May 4, 2020**

**Delivery date:May 22, 2020, time 23:59**

**Delivery method:Online submission via e-class. Exact instructions will be given as to what you must deliver and how.**