

Homework 5

CENG431 – Building Software Systems

In this homework you are expected to implement a “**Computer Comparison Application**”. You should fulfill the concepts of:

- Abstract Factory Design Pattern
- Decorator Design Pattern

Imagine there are two factories that the first one produces gaming computer devices and the other produces regular computer devices.

The produced devices are of three types:

- Input Devices
- Output Devices
- Hardware Devices

Input devices are:

- Keyboard with attributes:
 - numberOfKeys
 - hasBacklight
- Mouse with attribute:
 - isWireless

Output Devices are:

- Monitor with attribute:
 - inch
- Headphone with attributes:
 - isWireless
 - hasMicrophone

Hardware Devices are:

- CPU with attributes:
 - version (for example i5, i7 etc.)
 - frequency (for example 5.4 Ghz)
- RAM with attributes:
 - capacity

Devices	Regular Computer Factory	Gaming Computer Factory	Device Attributes
Keyboard	80 < price < 450	500 < price < 1500	84 <numberOfKeys< 108
Mouse	27 < price < 78	300 < price < 850	
Monitor	900 < price < 1500	2500 < price < 3500	inch: 18, 21, 25, 27
Headphone	40 < price < 400	600 < price < 1900	
CPU	8000 < price < 12000	14000 < price < 24000	version: i3, i5, i7
RAM	1500 < price < 3500	7000 < price < 19000	capacity:32,64,128,256

The price of a device and some of the attributes could be determined randomly according to the given intervals above. There are also some production rules for these factories below:

- Regular Computer Factory produces keyboards without backlight, wireless mice, only 18 or 21 inch monitors, headphones without microphone, i3 or i5 CPUs, 32, 64 or 128 GB RAMs.
- Gaming Computer Factory produces keyboards with backlight, mice with wires, monitors that could be any inch, headphones with microphone, i7 or i5 CPUs, 128 or 256 GB RAMs.

Implement the following scenario by using Decorator Design Pattern.

By default, both factories produce computers with copper cables that has speed 10 mps without taking any money. The cable could be made from gold which is six times faster than copper cable or could be made from silver which is four times faster than copper. Gold cable is 500 TL and silver cable is 350 TL.

Assemble both a regular and a gaming computer and compare them by listing their and their devices' prices in a menu.

Assignment Rules

1. Cheating is not allowed. If any cheating has been detected, they will be graded with 0 and there will be no further discussion on this.
2. You are expected to submit your homework in groups. Therefore, only one of you will be sufficient to submit your homework.
3. Make sure you export your homework as Eclipse projects. You can use other IDEs as well, however, you must test if it supported by Eclipse.
4. If you are using an external library, make sure that ".jar" library is in your project after you exported it. Unfortunately, from our previous experiences we have encountered homework submissions that uses libraries from their "Desktop".
5. Please submit your homework through CMS.
6. Please export your Java Project as the given format with your assigned.

Example:

G02_CENG431_HW2.zip. (Your group IDs will be announced on CMS).

7. Please be informed that your submissions may be anonymously used in software testing and maintenance research studies. Your names and student IDs will be replaced with non-identifying strings. If you do not want your submissions to be used in research studies, please inform the instructor (Dr. Tuglular) via e-mail.