Lab Exam - 1
Object Oriented Methodology
Spring of 2020-2021

Title:
Indigo Star Enterprises

Problem Statement:
Assume that Indigo Star Enterprises is a firm that specializes in Cooling solutions. In particular, they manufacture the following products:

1. **Compressor**: A compressor is the heart of any cooling solution. It is available in various capacities. Indigo Star manufactures two versions. LARGE means a 3 HP compressor and SMALL implies a 0.5 HP compressor. The only operations that a compressor supports are to switch it on and off.
2. **Cooling Unit**: A Cooling Unit is, as its name suggests, a unit for providing cooling effect. A Cooling Unit could be used for different purposes. For instance, a Cooling Unit for cooling rooms is popularly called Air Conditioner. Another example of a Cooling Unit is a Freezer, used to store food items. A Cooling Unit can store two pieces of information – *Current Temperature* and *Required Temperature*. For now, assume that both these can be set directly by a human (even though in a real setting, the human will only set the required temperature, while the Current Temperature will be sensed through sensors). The Cooling Unit, other than the operations for setting these two pieces of information, provides just one operation – *cool*. This operation brings down the Current Temperature to the Required Temperature, if it was greater, otherwise the operation does nothing. Assume that the minimum temperature to which a Cooling Unit can cool down is -5.5 °C. If the required temperature is set to anything less than that, the Cooling Unit will not reduce the Current Temperature below -5.5 °C. Also, assume that the Normal Room Temperature (i.e., the default value for Current Temperature) is 25 °C. Whenever required, the Cooling unit "switches on" its compressor to perform the cooling.
3. **Air Conditioner**: A specific type of Cooling Unit where you only supply the Current and Required Temperatures, and the cooling happens in "background". This means the *cool* operation cannot be accessed directly but is implicitly called if the Current Temperature is set to a higher value than the Required Temperature.
4. **Freezer**: A specific type of Cooling Unit where the only possible operations are to plug-in or plug-out the Freezer. The cooling happens in "background", starting from the Normal Room Temperature, going up to the minimum cooling point.

Create a Class Structure to Represent the Products manufactured by Indigo Start and showcase the operations that their Air Conditioner and Freezer can perform. Remember that even though there may be a small amount of credit for producing code with full functionality, you will be evaluated more on how you structure your code and not the output it produces.
Also, use an appropriate strategy to elegantly build the executables, e.g., through the use of a makefile.

Deliverables: Create a Zipped file of your code (including Header, CPP and make-related files etc.) and send it to your respective TA. You will have to appear for a Viva, the time for which needs to be decided between you and your TA.

All the best.