OOPCS Workshop – Smart Home (Interface)

Consider a program that has two types of Smart Appliances - a Lamp and a Fridge.

The following actions for smart appliances are supported:

- Turn on and off the lamp
- Open and close the fridge

Both keep track of the number of times their supported actions are invoked. For example, the lamp tracks how many times it has been turned on and the fridge how many times it has been opened.

The lamp will not turn on if it is currently on (need to turn it off first); likewise, the fridge will not open if it is currently opened (need to close it first).

The health of these two smart appliances depends on the number of usages. For the lamp, it would be how many times it has been turned on, and the fridge, how many times it has been opened.

A lamp needs servicing after 15 counts of usage (i.e., turn on/off), while a fridge after 20 counts (i.e., open/close).

Finally, each smart appliance can be assigned a name.

<u>Your Task</u>

1. Design and implement the smart appliances as described.

2. Using the concept of **Interface**, design and implement a Health Checker that can determine the health of a smart appliance if the smart appliance provides the following 3 pieces of information:
    - its usage-count
    - its type ("Lamp" or "Fridge")
    - its name

3. Create the following smart appliances in your Main program:
    - 3 Lamp objects
    - 1 Fridge object

4. Simulate usage for your smart appliances by adding code to turn on/off your lamps and open/close your fridge in your Main program.

5. After your smart appliances have been used for a X number of times, use your Health Checker to check and output their health-status.

6. Note that the smart appliances have no way to check on themselves. They need to be checked by a Health Checker.

7. A possible output from your Health Checker would look like.

```
living_room_lamp is healthy after 15 uses.
master_room_lamp is healthy after 14 uses.
study_room_lamp needs servicing after 17 uses.
fridge is healthy after 19 uses.
```