### CASE SMART HOME SYSTEM

You are planning to create a representation of your Smart Home System. To achieve this, you want to develop a piece of software.

A Smart Home System has a central Hub. A Hub connects to multiple devices. The maximum number of devices that can be connected must be specified in the constructor.

A Hub can be associated with the following devices: one or more Smart Lights, one or more Smart Thermostats, and one or more Smart Security Cameras. A Smart Light requires one connection slot. A Smart Thermostat requires two slots, and a Smart Security Camera requires three slots.

Additionally, the following data needs to be stored: the maximum brightness level of a Smart Light, the minimum and maximum temperature range of a Smart Thermostat, and the resolution of a Smart Security Camera.

When adding a device (Smart Light, Smart Thermostat, or Smart Security Camera) to the Hub, it must be checked whether there are enough connection slots available. If not, a NotEnoughSlots must be thrown.

The Smart Home System allows the user to activate a security mode. When this mode is enabled, all Smart Security Cameras must be turned on, and all Smart Lights must be set to a dim level. If no cameras are available, a NoCameraAvailable must be thrown.

Additionally, you should be able to check if the system is energy efficient. If the total power consumption of all devices exceeds 80% of the Hub’s power limit, the system is considered inefficient, and false must be returned. Otherwise, true must be returned.

### EXERCISE 1

Create the class diagram based on the text above.

### EXERCISE 2

Build the application based on your class diagram. Also, write Unit Tests for enabling security mode and checking if the system is energy efficient.