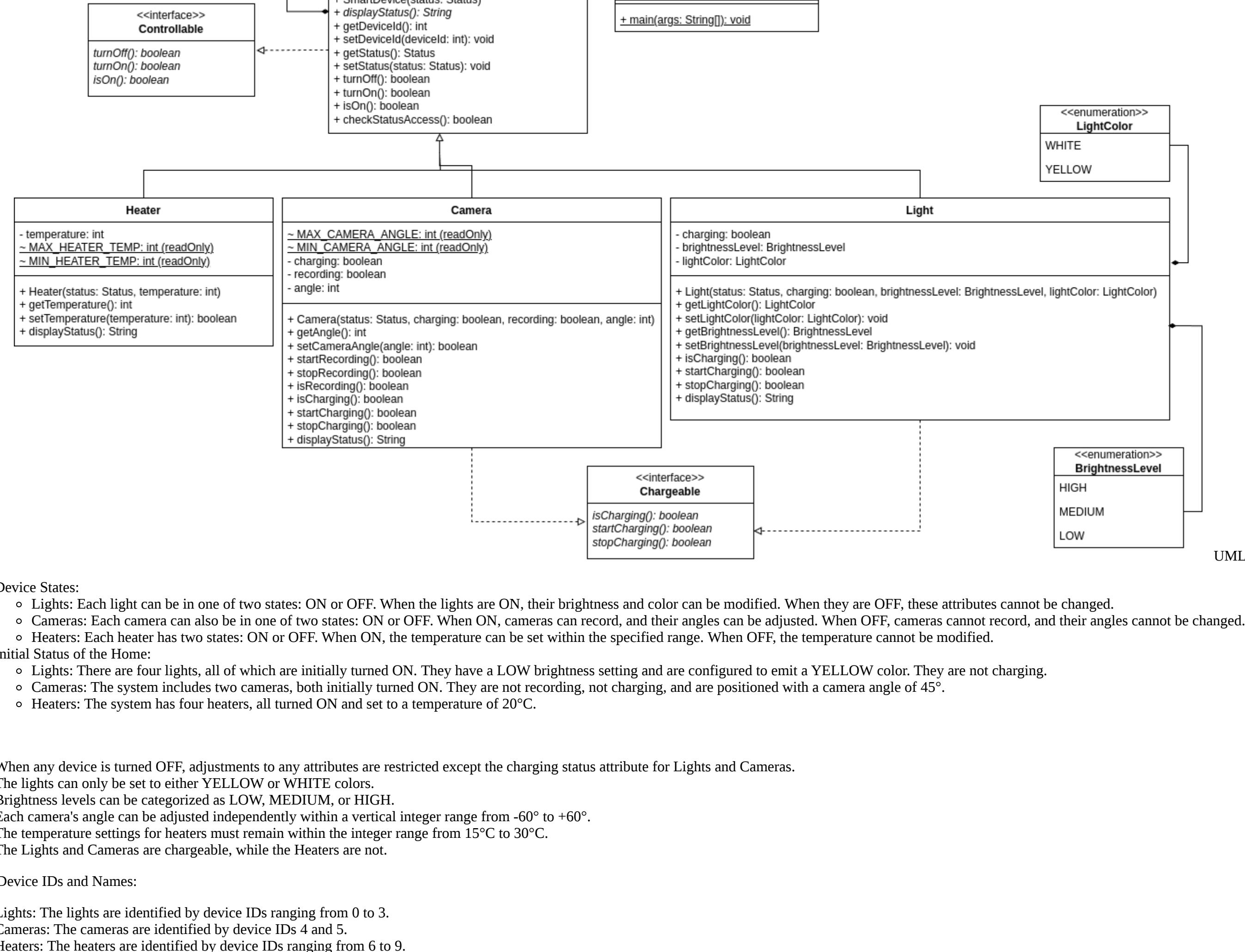


A. Smart Home system
time limit per test
1 second
memory limit per test
256 megabytes
input
standard input
output
standard output

Smart Home System

Description:

The smart home system is designed to manage various smart devices, including Lights, Cameras, and Heaters. Each device has capabilities for being activated or deactivated, alongside particular features and settings that can be manipulated when the devices are in the ON state. Here is the UML class diagram that represents the structure of the code:



UML

- Device States:
 - Lights: Each light can be in one of two states: ON or OFF. When the lights are ON, their brightness and color can be modified. When they are OFF, these attributes cannot be changed.
 - Cameras: Each camera can also be in one of two states: ON or OFF. When ON, cameras can record, and their angles can be adjusted. When OFF, cameras cannot record, and their angles cannot be changed.
 - Heaters: Each heater has two states: ON or OFF. When ON, the temperature can be set within the specified range. When OFF, the temperature cannot be modified.
- Initial Status of the Home:
 - Lights: There are four lights, all of which are initially turned ON. They have a LOW brightness setting and are configured to emit a YELLOW color. They are not charging.
 - Cameras: The system includes two cameras, both initially turned ON. They are not recording, not charging, and are positioned with a camera angle of 45°.
 - Heaters: The system has four heaters, all turned ON and set to a temperature of 20°C.

Rules:

- When any device is turned OFF, adjustments to any attributes are restricted except the charging status attribute for Lights and Cameras.
- The lights can only be set to either YELLOW or WHITE colors.
- Brightness levels can be categorized as LOW, MEDIUM, or HIGH.
- Each camera's angle can be adjusted independently within a vertical integer range from -60° to +60°.
- The temperature settings for heaters must remain within the integer range from 15°C to 30°C.
- The Lights and Cameras are chargeable, while the Heaters are not.

Initial Device IDs and Names:

- Lights: The lights are identified by device IDs ranging from 0 to 3.
- Cameras: The cameras are identified by device IDs 4 and 5.
- Heaters: The heaters are identified by device IDs ranging from 6 to 9.
- Names: The name of any device should be from the following set of names: {Camera, Heater, Light}.

Commands:

Command	Description
DisplayAllStatus	Displays the current status of all devices in the system.
TurnOn {deviceName} {deviceId}	Turns a specified device ON.
TurnOff {deviceName} {deviceId}	Turns a specified device OFF.
StartCharging {deviceName} {deviceId}	Starts charging a specified device, if chargeable.
StopCharging {deviceName} {deviceId}	Stops charging a specified device, if chargeable.
SetTemperature {deviceName} {deviceId} {temperature}	Sets the temperature for a specified heater device within its allowable range [15, 30].
SetBrightness {deviceName} {deviceId} {brightnessLevel}	Sets the brightness level (LOW, MEDIUM, HIGH) for a specified light device.
SetColor {deviceName} {deviceId} {color}	Sets the color (YELLOW or WHITE) for a specified light device.
SetAngle {deviceName} {deviceId} {angle}	Adjusts the camera angle within the range [-60, 60] for a specified camera device.
StartRecording {deviceName} {deviceId}	Starts recording for a specified camera device.
StopRecording {deviceName} {deviceId}	Stops recording for a specified camera device.
end	It is the end of the input, after which the program should stop.

The DisplayAllStatus command displays the current status of each device in the system by calling the displayStatus method for every device in an array of SmartDevice objects.

Each type of device has its own displayStatus method that returns a formatted string with the device's status information, which is printed to the console. Here is how each type of device's status is displayed:

- For Light devices:
 - Returns information about its ID, power status (ON or OFF), color, charging status, and brightness level.
 - Example output format: "Light {deviceId} is {status}, the color is {color}, the charging status is {chargingStatus}, and the brightness level is {brightnessLevel}."
- For Camera devices:
 - Returns information about its ID, power status, angle, charging status, and recording status.
 - Example output format: "Camera {deviceId} is {status}, the angle is {angle}, the charging status is {chargingStatus}, and the recording status is {recordingStatus}."
- For Heater devices:
 - Returns information about its ID, power status, and temperature.
 - Example output format: "Heater {deviceId} is {status} and the temperature is {temperature}."

Errors:

Condition	Error Message
The command doesn't follow the structure of a command or has incorrect values	Invalid command
If a device with the specified name and ID was not found	The smart device was not found
Charging a non-chargeable device	{deviceName} {deviceId} is not chargeable
Stopping charging on a non-chargeable device	{deviceName} {deviceId} is not chargeable
Setting temperature for a non-heater device	{deviceName} {deviceId} is not a heater
Setting brightness level out of scope	The brightness can only be one of "LOW", "MEDIUM", or "HIGH"
Setting brightness level for a non-light device	{deviceName} {deviceId} is not a light
Setting color of a light to an invalid value	The light color can only be "YELLOW" or "WHITE"
Setting color for a non-light device	{deviceName} {deviceId} is not a light
Setting camera angle for a non-camera device	{deviceName} {deviceId} is not a camera
Starting to record on a non-camera device	{deviceName} {deviceId} is not a camera
Stopping to record on a non-camera device	{deviceName} {deviceId} is not a camera
Turning off a device that is already off	{deviceName} {deviceId} is already off
Turning on a device that is already on	{deviceName} {deviceId} is already on
Changing the device's attributes while it is off (except charging state)	You can't change the status of the {deviceName} {deviceId} while it is off
Setting camera angle out of allowed range	Camera {deviceId} angle should be in the range [-60, 60]
Starting to record when the camera is already recording	{deviceName} {deviceId} is already recording
Stopping to record when the camera is not recording	{deviceName} {deviceId} is not recording
Charging a device that is already charging	{deviceName} {deviceId} is already charging
Stopping charging on a device that is not charging	{deviceName} {deviceId} is not charging
Setting heater temperature out of range	Heater {deviceId} temperature should be in the range [15, 30]

The command structure is correct?

1. If the command name is correct and matches one of the possible commands names.
2. If the command must include a device name, and the device name is included.
3. If the number of the fields of the command is correct.
4. If the command must include an integer value and then the command includes it.

