Lab 7: OOP Summary

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- **Subjects:** PRO192

Submission:

- Using templates: https://drive.google.com/drive/folders/1qTLYES8WC0TCjI9KZdaoNZh9TkqEhj33?usp=drive_link
- Create folder:

```
<StudentNameCode>Lab7/
├── run
    ├── <project>.jar
├── src
    ├── projects / or zip project
```

- Update project name: `<StudentNameCode>Lab7`. Ex: `NguyenCTCE172070Lab7`
- Zip this project: `NguyenCTCE172070Lab7.zip`

Problem Context:

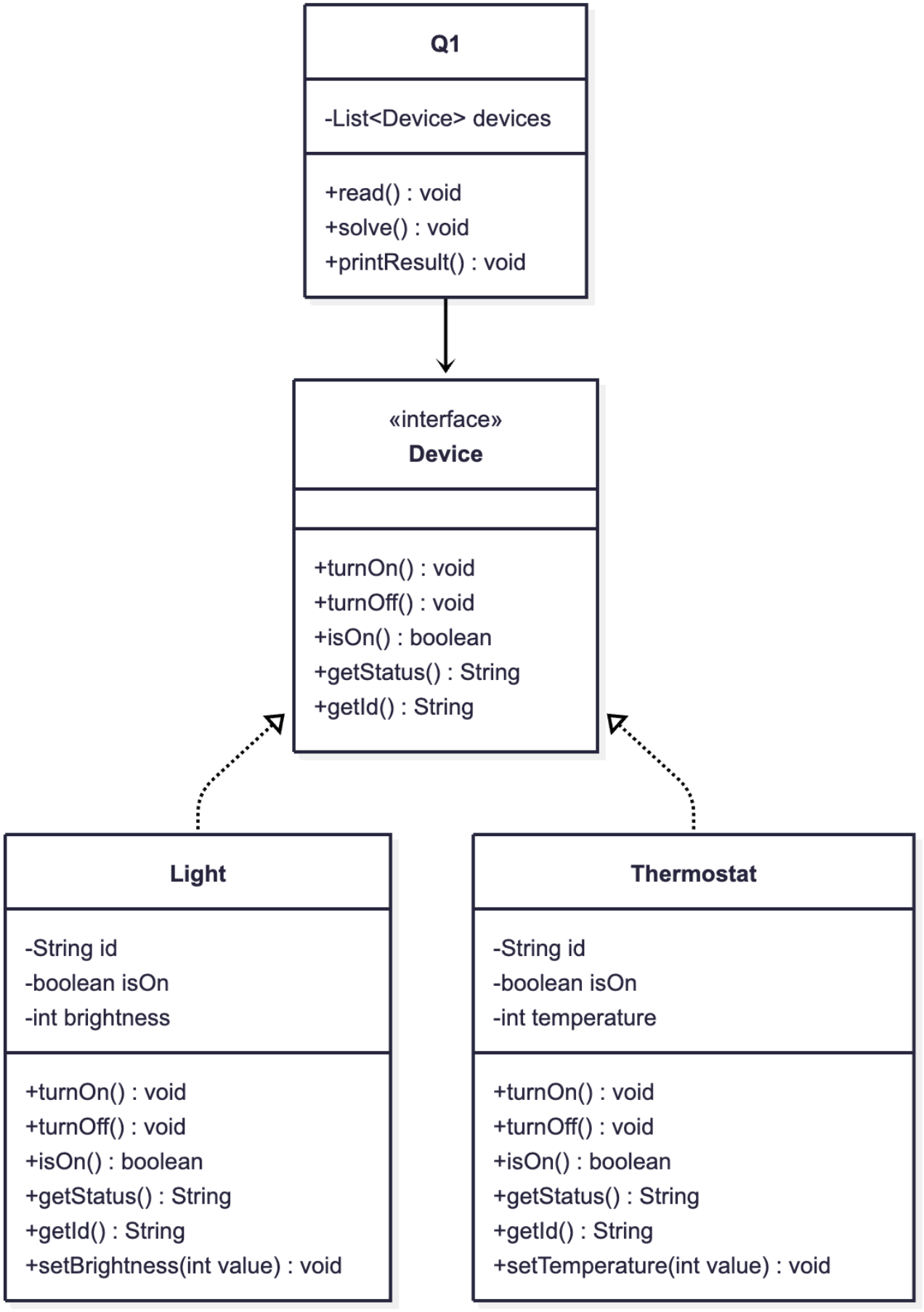
You are tasked with building a smart home automation system that manages smart devices like **Light** and **Thermostat**. These devices implement a common **Device interface**. A controller class Q1 will read commands from a file and execute actions accordingly.

Class Light implements Device

- Attributes: id, isOn, brightness **(0–100)**
- Supports commands:
  - SetBrightness id value
  - turnOn/turnOff

Class Thermostat implements Device

- Attributes: id, isOn, temperature (°C) **(10–35)**
- Supports commands:
  - SetTemperature id value
  - turnOn/turnOff



Resolve problems:

New input file format

```
n
<command 1 of question>
<command 2 of question>
...
```

Command	Description
`Light id`	Create a new Light
`Thermostat id`	Create a new Thermostat
`TurnOn id`	Turn on a device
`TurnOff id`	Turn off a device
`SetBrightness id value`	Set brightness of Light (Between 0 to 100)
`SetTemperature id value`	Set temperature of Thermostat (Between 10 to 35)
`Status id`	Print status of device
`StatusAll`	Print all devices

Test Case 1:

Input

```
3
Light L1
Thermostat T1
StatusAll
```

Output

```
Add Light: L1
Add Thermostat: T1
-- Device Status --
L1 [OFF] - Brightness: 0
T1 [OFF] - Temperature: 0°C
```

Test Case 2:

Input

```
4
Light L1
TurnOn L1
```

```
TurnOff L1
Status L1
```

Output

```
Add Light: L1
L1 turned on
L1 turned off
L1 [OFF] – Brightness: 0
```

Test Case 3:

Input

```
4
Light L2
TurnOn L2
SetBrightness L2 80
Status L2
```

Output

```
Add Light: L2
L2 turned on
L2 brightness set to 80
L2 [ON] – Brightness: 80
```

Test Case 4:

Input

```
7
Light L3
Thermostat T3
TurnOn L3
SetBrightness L3 55
TurnOn T3
SetTemperature T3 21
StatusAll
```

Output

```
Add Light: L3
Add Thermostat: T3
L3 turned on
L3 brightness set to 55
T3 turned on
T3 temperature set to 21
-- Device Status --
L3 [ON] - Brightness: 55
T3 [ON] - Temperature: 21°C
```

Test Case 5:

Input

```
6
Add Light L9
Add Thermostat T3
SetBrightness L9 150
SetBrightness L9 80
SetTemperature T3 40
SetTemperature T3 25
```

Output

```
Add SmartLight: L9
Add SmartThermostat: T3
L9 brightness value 150 is invalid!
L9 brightness set to 80
T3 temperature value 40 is invalid!
T3 temperature set to 25
```