Introduction

This project implements a Smart Home system using object-oriented design principles in C++. The main focus of my contribution is the Add Device functionality, implemented using the Factory Method design pattern.

2. Design Pattern Used – Factory Method

The Factory Method pattern is used to create different types of devices (Light, Camera, TV) without exposing the creation logic to the client. This improves extensibility and follows the Open–Closed Principle.

3. Implementation

A base abstract class Device is defined. Concrete device classes such as Light, Camera, and TV inherit from it. DeviceFactory decides which concrete device to create based on user input. The abstract Device class defines common attributes such as name and power state. Concrete device classes override the getType() method. The DeviceFactory class creates device objects based on user input.

4. Add Device Functionality

The program allows the user to select the number of devices and the device type from the menu. Devices are created dynamically using the factory and stored in a list.

5. Version Control

Git and GitHub were used to track development. Each step of the implementation was committed separately to show progress.

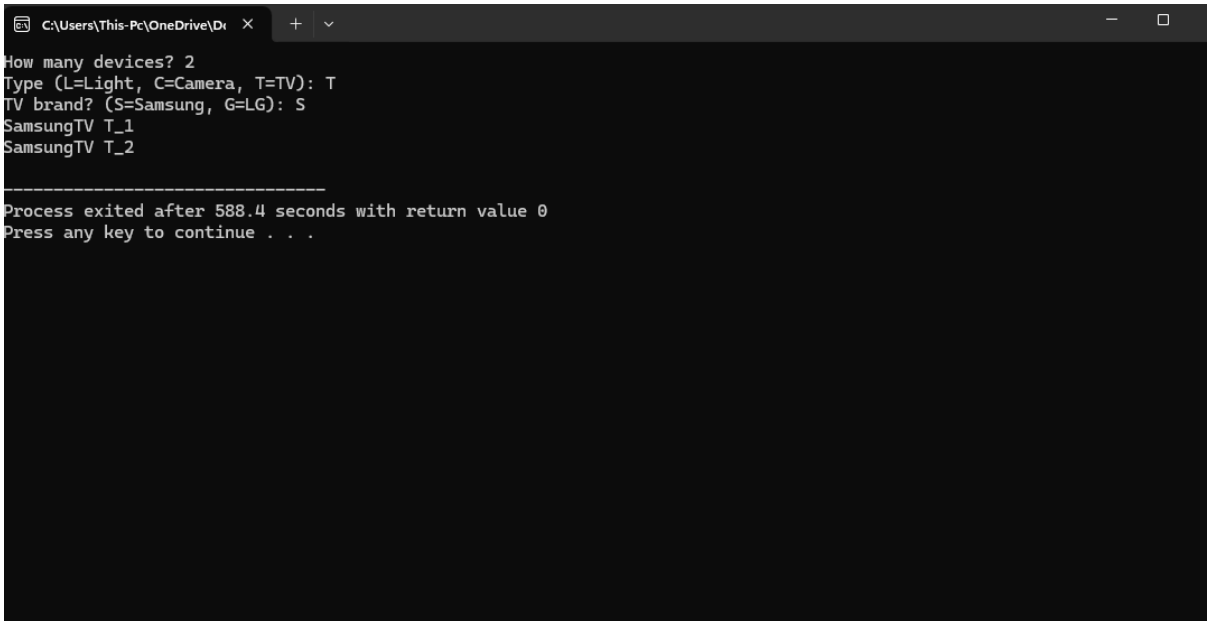
6.

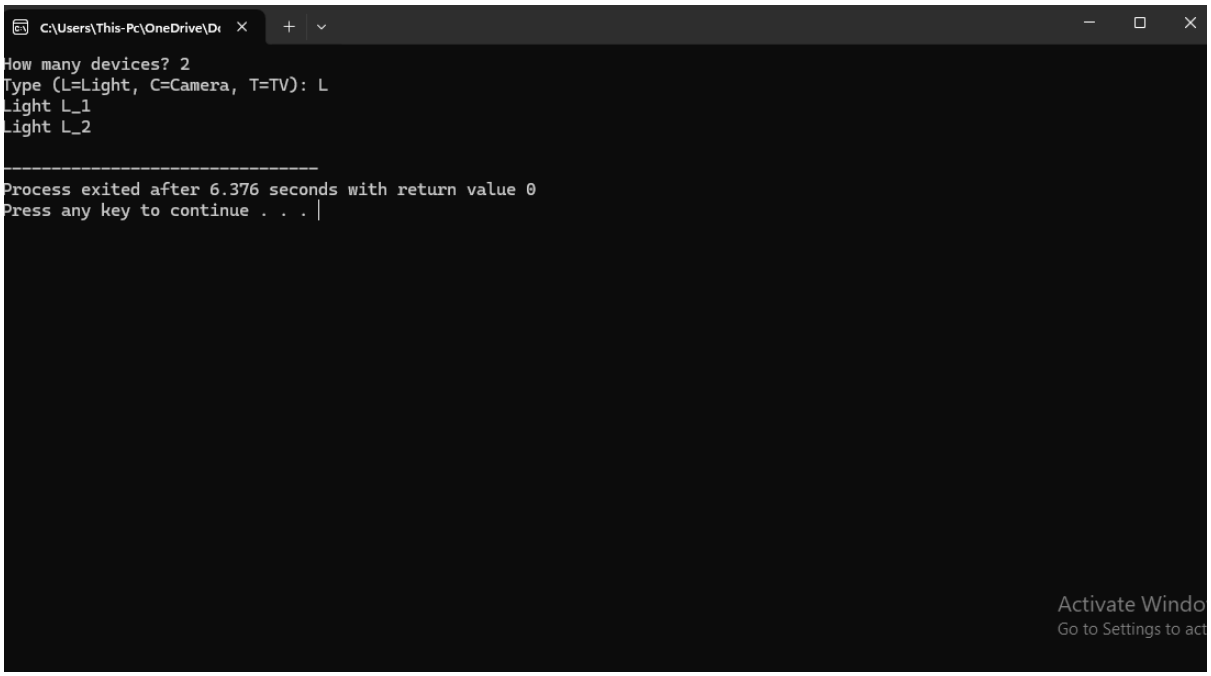
The implementation strictly follows the Phase 2 design. The Factory Method pattern described in the design phase was implemented without changing responsibilities.

Additional TV brand specialization (SamsungTV and LGTV) was added using inheritance, which is consistent with the design constraints given in the project

description.

Output:





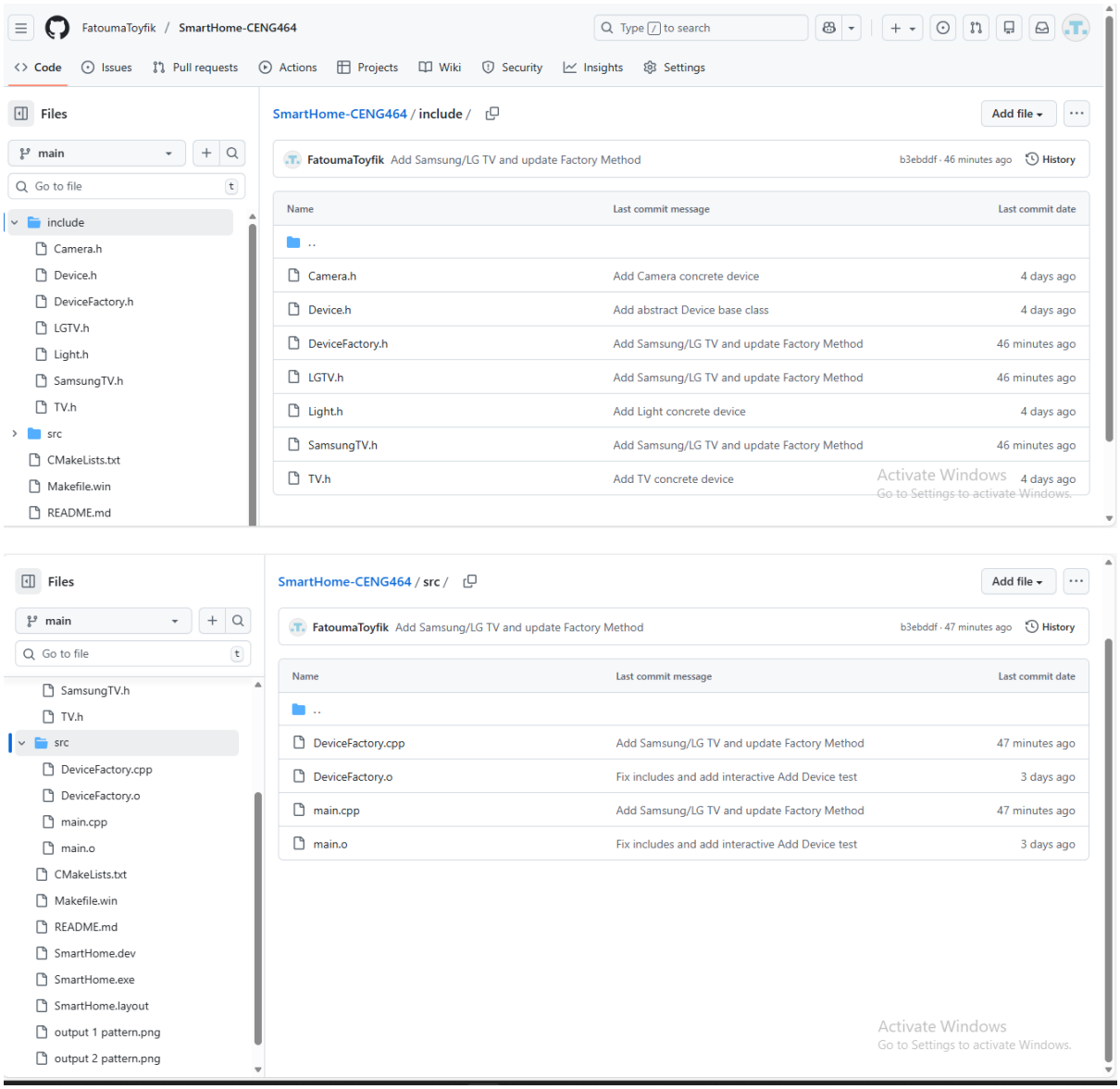
Device creation is dynamic

Client (main) does NOT know concrete classes

Factory decides which object to create

TV brands are handled using inheritance

COMMITS:


FatoumaToyfik / SmartHome-CENG464
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Files
main
Go to file
include
Camera.h
Device.h
DeviceFactory.h
LGTV.h
Light.h
SamsungTV.h
TV.h
src
CMakeLists.txt
Makefile.win
README.md
SmartHome-CENG464 / include /
Add file
FatoumaToyfik Add Samsung/LG TV and update Factory Method
b3ebddf · 46 minutes ago
History
Name
Last commit message
Last commit date
..
Camera.h
Add Camera concrete device
4 days ago
Device.h
Add abstract Device base class
4 days ago
DeviceFactory.h
Add Samsung/LG TV and update Factory Method
46 minutes ago
LGTV.h
Add Samsung/LG TV and update Factory Method
46 minutes ago
Light.h
Add Light concrete device
4 days ago
SamsungTV.h
Add Samsung/LG TV and update Factory Method
46 minutes ago
TV.h
Add TV concrete device
4 days ago
Activate Windows
Go to Settings to activate Windows.

Files
main
Go to file
SamsungTV.h
TV.h
src
DeviceFactory.cpp
DeviceFactory.o
main.cpp
main.o
CMakeLists.txt
Makefile.win
README.md
SmartHome.dev
SmartHome.exe
SmartHome.layout
output 1 pattern.png
output 2 pattern.png
SmartHome-CENG464 / src /
Add file
FatoumaToyfik Add Samsung/LG TV and update Factory Method
b3ebddf · 47 minutes ago
History
Name
Last commit message
Last commit date
..
DeviceFactory.cpp
Add Samsung/LG TV and update Factory Method
47 minutes ago
DeviceFactory.o
Fix includes and add interactive Add Device test
3 days ago
main.cpp
Add Samsung/LG TV and update Factory Method
47 minutes ago
main.o
Fix includes and add interactive Add Device test
3 days ago
Activate Windows
Go to Settings to activate Windows.