Smart Home Automation System

# 1. Detailed Domain Description

A Smart Home Automation System is designed to enhance the comfort, security, and energy efficiency of a home by automating and remotely controlling household systems and appliances. The system enables users to monitor and control lighting, HVAC, security cameras, door locks, and appliances using mobile apps or voice commands. The system collects data from sensors and makes intelligent decisions or allows manual overrides.  
  
Key Features:  
- Remote control and automation of lights, fans, and appliances.  
- Temperature regulation through smart thermostats.  
- Intrusion detection using cameras and motion sensors.  
- Door access control via smart locks.  
- Scheduling and rules-based automation.  
- Real-time notifications and alerts.  
  
Users:  
- Homeowners (Primary users)  
- Family members  
- System Administrators (for installation and maintenance)

# 2. Initial Object Identification Table

|  |  |
| --- | --- |
| Object Name | Description |
| SmartDevice | Abstract representation of any connected device |
| Light | Smart lighting system |
| Thermostat | Temperature control device |
| SecurityCamera | Surveillance camera |
| MotionSensor | Detects movement |
| SmartLock | Electronic door lock |
| User | Homeowner or family member |
| MobileApp | Interface to interact with the system |
| AutomationRule | Rules for automated behavior |
| Notification | Alerts sent to users |

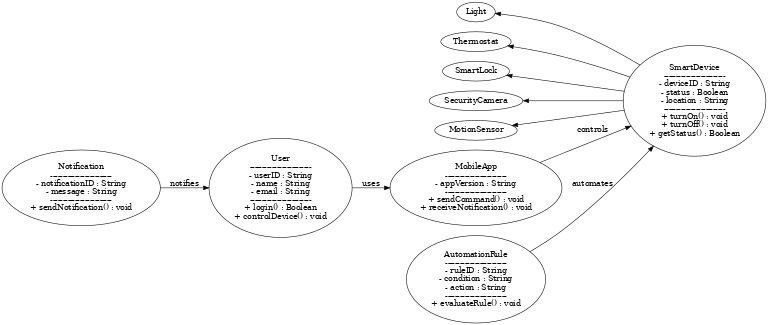
# 3. Initial Attribute and Method Tables

## Class: SmartDevice - Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| deviceID | String | Private | Unique ID for each device |
| status | Boolean | Private | On/Off state |
| location | String | Private | Room/area where installed |

## Class: SmartDevice - Methods

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| turnOn() | void | Public | Activates the device |
| turnOff() | void | Public | Deactivates the device |
| getStatus() | Boolean | Public | Returns the current status |

1. **UML Class diagram**