**Smart building management**

**Simulation code**

**import random**

**import time**

**class SmartBuilding:**

**def \_\_init\_\_(self):**

**self.lighting\_status = False**

**self.temperature = 22 # Initial temperature**

**self.security\_status = False**

**self.energy\_consumption = 0**

**def toggle\_lighting(self):**

**self.lighting\_status = not self.lighting\_status**

**if self.lighting\_status:**

**self.energy\_consumption += 10 # Lighting consumes 10 units of energy**

**print(f"Lighting {'on' if self.lighting\_status else 'off'}")**

**def adjust\_temperature(self, temp):**

**if temp > 22:**

**self.energy\_consumption += 20 # Cooling consumes 20 units of energy**

**elif temp < 22:**

**self.energy\_consumption += 15 # Heating consumes 15 units of energy**

**self.temperature = temp**

**print(f"Temperature set to {temp}°C")**

**def toggle\_security(self):**

**self.security\_status = not self.security\_status**

**if self.security\_status:**

**self.energy\_consumption += 5 # Security system consumes 5 units of energy**

**print(f"Security {'enabled' if self.security\_status else 'disabled'}")**

**def simulate\_day(self):**

**# Simulate a day in the building**

**for hour in range(8, 18): # 8 am to 6 pm**

**# Randomly adjust lighting and temperature**

**if random.random() < 0.5:**

**self.toggle\_lighting()**

**if random.random() < 0.3:**

**self.adjust\_temperature(random.randint(20, 25))**

**# Check security status**

**if self.security\_status:**

**if random.random() < 0.1: # 10% chance of security breach**

**print("Security alert! Intruder detected!")**

**self.toggle\_security()**

**# Print current status**

**print(f"Hour {hour}:")**

**print(f"Lighting: {'on' if self.lighting\_status else 'off'}")**

**print(f"Temperature: {self.temperature}°C")**

**print(f"Security: {'enabled' if self.security\_status else 'disabled'}")**

**print(f"Energy Consumption: {self.energy\_consumption} units")**

**print(f"-------------------------")**

**time.sleep(1) # Simulate 1 hour**

**# Create a smart building instance**

**building = SmartBuilding()**

**building.toggle\_security() # Enable security system**

**building.adjust\_temperature(22) # Set initial temperature**

**# Simulate a day**

**building.simulate\_day()**