```java
// SmartHomeApp.java

import java.util.*;

interface Device {

    String getName();

    String getRoom();

    void turnOn();

    void turnOff();

    String getStatus();
}

abstract class AbstractDevice implements Device {

    public String name;
    public String room;
    public boolean isOn;

    public AbstractDevice(String name, String room) {
        this.name = name;
        this.room = room;
        this.isOn = true;
    }

    @Override
    public String getName() {
        return name;
    }

    @Override
    public String getRoom() {
        return room;
    }

    @Override
    public String getStatus() {
        return name + " on Floor " + room + " is " + (isOn ? "on" : "off");
    }

}

class SmartFan extends AbstractDevice {

    public int speed;

    public SmartFan(String name, String room) {
        super(name, room);
        this.speed = 0;
    }

    @Override
    public void turnOn() {
        isOn = true;
        System.out.println(name + "is turned On");
    }

    @Override
    public void turnOff() {
        isOn = false;
        System.out.println(name + "is turned Off");
    }
```

```
    // Set the fan speed (1 to 3)
    public void setSpeed(int speed) {
        if (speed >= 1 && speed <= 3) {
            this.speed = speed;
            System.out.println(name + " fan speed set to " + speed);
        }
    }

    @Override
    public String getStatus() {
        // Add speed information to the status
        String status = super.getStatus();
        if (isOn) {
            status += " at speed " + speed;
        }
        return status;
    }
}

class SmartLight extends AbstractDevice {

    public SmartLight(String name, String room) {
        super(name, room);
    }

    @Override
    public void turnOn() {
        isOn = true;
        System.out.println(name + "is turned On");
    }

    @Override
    public void turnOff() {
        isOn = false;
        System.out.println(name + "is turned Off");
    }

    @Override
    public String getStatus() {
        return super.getStatus();
    }

}

class SmartTV extends AbstractDevice {

    public int volume;

    public SmartTV(String name, String room) {
        super(name, room);
        this.volume = 0;
    }

    @Override
    public void turnOn() {
        isOn = true;
        System.out.println(name + "is turned On");
    }

    @Override
    public void turnOff() {
        isOn = false;
        System.out.println(name + "is turned Off");
    }
```

```
    public void setVolume(int volume) {
        if (volume >= 0 && volume <= 100) {
            this.volume = volume;
            System.out.println(name + " volume set to " + volume);
        }
    }

    @Override
    public String getStatus() {
        String status = super.getStatus() + " volume " + volume;
        return status;
    }
}

class SmartAC extends AbstractDevice {

    public int temp;
    public String mode;

    public SmartAC(String name, String room) {
        super(name, room);
        this.temp = 24;
        this.mode = "cool";
    }

    @Override
    public void turnOn() {
        isOn = true;
        System.out.println(name + "is turned On");
    }

    @Override
    public void turnOff() {
        isOn = false;
        System.out.println(name + "is turned off");
    }

    public void setTemp(int temp) {
        if (isOn) {
            if (temp >= 16 && temp <= 30) {
                this.temp = temp;
                System.out.println(name + " temperature set to " + temp);
            }
        }
    }

    public String getStatus() {
        return super.getStatus() + "with temprature " + temp + " and mode " + mode;
    }
}

class SmartController {

    private List<Device> devices;

    public SmartController() {
        devices = new ArrayList<>();
    }

    public void addDevice(Device device) {
        devices.add(device);
    }

    public void ControllDevice(String name, boolean turnOn) {
        for (Device device : devices) {
            if (device.getName().equals(name)) {
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                if (turnOn) {
                    device.turnOn();
                } else {
                    device.turnOff();
                }
                return;
            }
        }
    }

    public void setACTemperature(String name, int temp) {
        for (Device device : devices) {
            if (device.getName().equalsIgnoreCase(name)) {
                if (device instanceof SmartAC) { // Check if the device is a SmartAC
                    ((SmartAC) device).setTemp(temp); // Cast to SmartAC and call setTemp
                    return;
                } else {
                    System.out.println("The device is not an AC.");
                    return;
                }
            }
        }
        System.out.println("AC device not found.");
    }

    public void showAllStatuses() {
        for (Device device : devices) {
            System.out.println(device.getStatus());
        }
    }

    public List<Device> getDevices() {
        return devices;
    }

}

public class SmartHomeApp{
    public static void main(String[] args) {

        SmartController controller = new SmartController();
        Scanner sc = new Scanner(System.in);
        System.out.println("Welcome to Smart Home App!");

        while (true) {
            System.out.println("\n--- Smart Home Menu ---");
            System.out.println("1. Add Device");
            System.out.println("2. Turn ON Device");
            System.out.println("3. Turn OFF Device");
            System.out.println("4. Set AC Temperature");
            System.out.println("5. Show All Device Status");
            System.out.println("6. Exit");
            System.out.print("Enter your choice: ");
            int choice = sc.nextInt();
            sc.nextLine(); // Consume newline

            switch (choice) {
                case 1:
                    System.out.print("Enter device type (Fan, Light, TV, AC): ");
                    String type = sc.nextLine();
                    System.out.print("Enter device name: ");
                    String name = sc.nextLine();
                    System.out.print("Enter room name: ");
                    String room = sc.nextLine();

                    switch (type.toLowerCase()) {
```

```
                        case "fan":
                            controller.addDevice(new SmartFan(name, room));
                            break;
                        case "light":
                            controller.addDevice(new SmartLight(name, room));
                            break;
                        case "tv":
                            controller.addDevice(new SmartTV(name, room));
                            break;
                        case "ac":
                            controller.addDevice(new SmartAC(name, room));
                            break;
                        default:
                            System.out.println("Invalid device type!");
                    }
                    break;

                case 2:
                    System.out.print("Enter device name to turn ON: ");
                    String onName = sc.nextLine();
                    controller.ControllDevice(onName, true);
                    break;

                case 3:
                    System.out.print("Enter device name to turn OFF: ");
                    String offName = sc.nextLine();
                    controller.ControllDevice(offName, false);
                    break;

                case 4:
                    System.out.print("Enter AC device name to set temperature: ");
                    String acName = sc.nextLine();
                    System.out.print("Enter temperature (16-30): ");
                    int temp = sc.nextInt();
                    controller.setACTemperature(acName, temp);
                    break;

                case 5:
                    controller.showAllStatuses();
                    break;

                case 6:
                    System.out.println("Exiting the app. Goodbye!");
                    return;

                default:
                    System.out.println("Invalid choice! Please try again.");

            }
        }

    }
}
```