Step 4: Pseudocode

Pseudocode sketch:

```
BEGIN
  room ← {"projector_on": False, "capacity": 30, "topic": ""}
  attendance ← set()
  temperatures ← []

  WHILE True
    show menu options
    choice ← input("Enter your choice:")

    IF choice == "1" THEN
      room["projector_on"] ← NOT room["projector_on"]

    ELSE IF choice == "2" THEN
      room["topic"] ← input("Enter class topic:")

    ELSE IF choice == "3" THEN
      name ← input("Enter student name:")
      add name to attendance
      IF len(attendance) > room["capacity"] THEN
        show "ROOM FULL"

    ELSE IF choice == "4" THEN
      name ← input("Enter student name to remove:")
      remove name from attendance if present

    ELSE IF choice == "5" THEN
      temp ← float input
      add temp to temperatures
      IF temp < 16 OR temp > 28 THEN
        show "Temperature Warning!"

    ELSE IF choice == "6" THEN
      show projector status, topic, attendance count
      show min, max, avg of temperatures
      IF topic is set AND projector is OFF THEN
        show "Reminder: Projector is off"

    ELSE IF choice == "7" THEN
      BREAK

    ELSE
      show "Invalid option"

  END WHILE
END
```

Step. 4-2: Explanation of Pseudocode Sketch

1. **room ← {"projector_on": False, "capacity": 30, "topic": ""}**
   → A dictionary that stores the room's current state, including whether the projector is on or off, the maximum number of students allowed, and the current class topic.

2. **attendance ← set()**
   → A set used to keep track of student names. Each name is unique, and students can be added or removed.

3. **temperatures ← []**
   → A list that stores all temperature readings logged during the session.

4. **WHILE True**
   → Starts an infinite loop so the menu will keep displaying until the user chooses to exit.

5. **show menu options**
   → Displays all available menu choices to the user (e.g., toggle projector, set topic, add student, etc.)

6. **choice ← input("Enter your choice:")**
   → Accepts the user's menu selection.

7. **IF choice == "1"**
   → Toggles the projector status. If it is ON, turn it OFF; if it is OFF, turn it ON.

8. **ELSE IF choice == "2"**
   → Asks the user to enter a class topic and updates the room["topic"] value.

9. **ELSE IF choice == "3"**
   → Prompts the user to enter a student name and adds it to the attendance set.
   → If the number of students exceeds the room capacity, displays a "ROOM FULL" message.

10. **ELSE IF choice == "4"**
    → Removes a student name from the attendance list if it exists.

11. **ELSE IF choice == "5"**
    → Accepts a temperature reading (float) and adds it to the temperatures list.
    → If the temperature is below 16°C or above 28°C, a warning is shown.

12. **ELSE IF choice == "6"**
    → Displays a status report showing:
    • Projector status
    • Topic
    • Number of students present
    • Minimum, maximum, and average temperatures
    → If a topic is set but the projector is off, shows a reminder to turn the projector on.

13. **ELSE IF choice == "7"**
    → Exits the loop and ends the program.

14. **ELSE**
    → If the user enters an invalid option, an error message is shown.

15. **END WHILE**
    → Marks the end of the loop structure.

16. **END**
    → Indicates the end of the program.