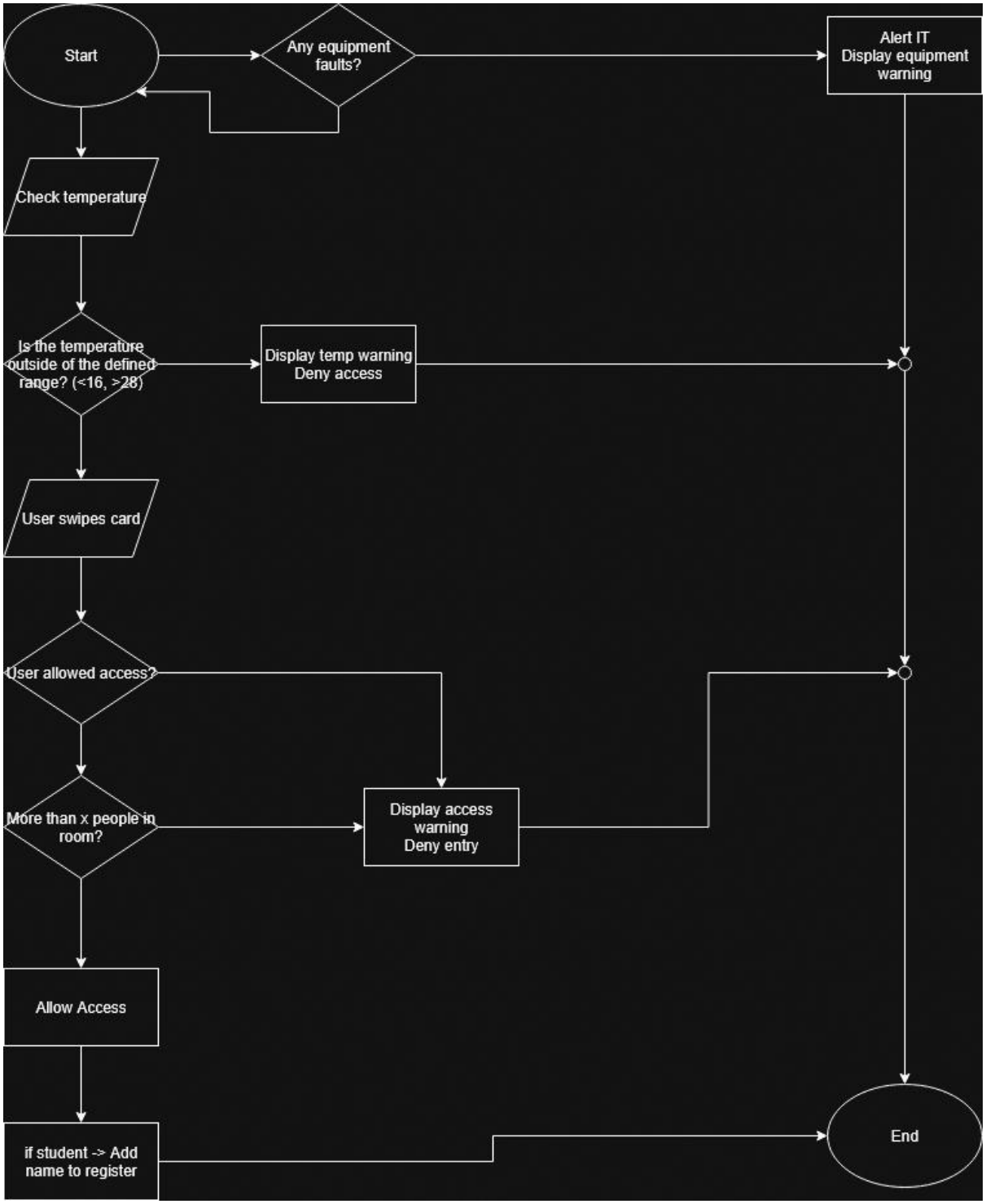
Case Study 2 – Steps 1-4

Step 1 – Understand the Problem

The client has requested a monitoring system for classrooms at their school. They have requested that students be able to check-in – tracking names and capacity. There has been a request for tracking of equipment statuses – Assuming if projector is on/off, lights on, computer status. A temperature gauge has been requested for the room to track and monitor temperature changes.
The ability to pull a status report on the classroom has been requested – This should be able to be separated into either attendance, equipment status, temperature, or call all 3 at once.

When the room reaches capacity, a warning should be shown and additional persons should be refused entry. If the temperature is outside of the defined range (<16 degrees, >28 degrees), a warning should be displayed and entry denied. If equipment is experiencing issues, a warning should be displayed and IT alerted.

The users will include teachers, students, administrative staff.


Start
Any equipment faults?
Alert IT
Display equipment warning
Check temperature
Is the temperature outside of the defined range? (<16, >28)
Display temp warning
Deny access
User swipes card
User allowed access?
More than x people in room?
Display access warning
Deny entry
Allow Access
if student -> Add name to register
End

Step 2 – Inputs and outputs

Inputs:

- Temperature gauge
- Card access
    - Name from card access
- Equipment monitor
    - Track power on, can it power on, etc – Could be achieved via an IOT system that sends pings to the system for status checks

Outputs:

- Warning if the temp is too high
- Warning if equipment is failing
    - Both on the system being used for warnings and to the IT team
- Warning if the room is at capacity, or if the user doesn't have access
- Database to track attendance
- Track how many users have entered the room
- Various reports as required
    - Only temp
    - Only attendance
    - Only equipment
    - All of the above

Step 3 – Plan the solution

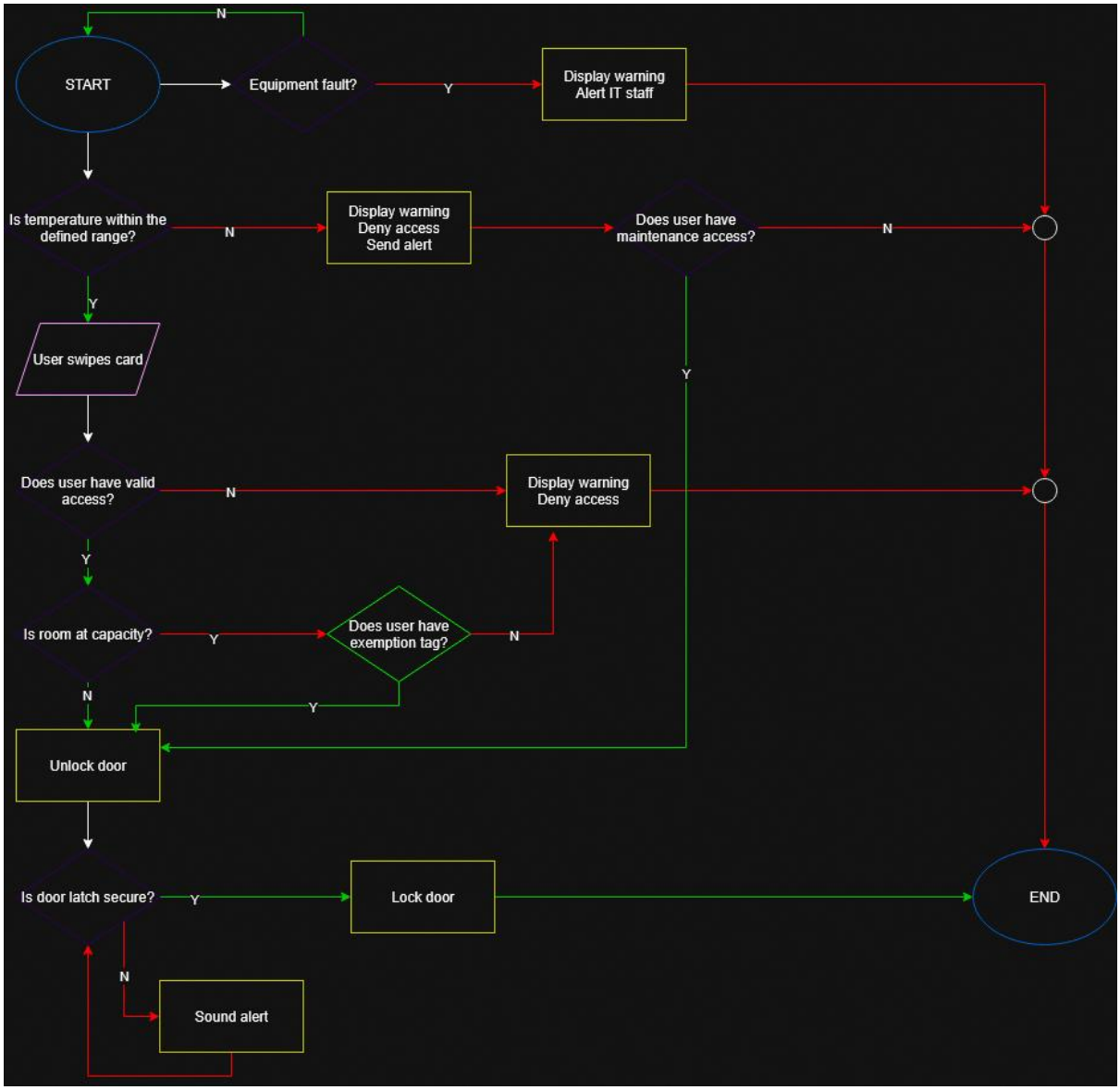
Decision logic w/ error detection:

- Start system
- Check temperature
    - Is temp outside of the defined range (<16, >28)?
        - If yes, deny access, send alert, display warning
        - If no, allow access, display temp
- Is there any faulty equipment?
    - If yes
        - Send alert to IT
        - Display warning
    - If no
        - Loop to check
- Card access – Assume card swiped for all instances
    - Is the room currently at capacity?

        - If yes, deny additional access
        - Display warning
        - If no, proceed
    - Is access valid?
        - If yes, unlock door, capacity count +1
        - If no, deny access, display warning

Possible exemptions and ideas:

- Administrator access
    - Allow anyone with the admin tag entry in all scenarios
    - Allow anyone with the maintenance tag entry
    - Allow teachers access when the room is full
- If the door doesn't close and latch properly
    - Sound a consistent alarm until rectified


START
Equipment fault?
N
Y
Display warning
Alert IT staff
Is temperature within the defined range?
N
Display warning
Deny access
Send alert
Does user have maintenance access?
N
Y
User swipes card
Y
Does user have valid access?
N
Display warning
Deny access
Y
Is room at capacity?
Y
Does user have exemption tag?
N
N
Y
Unlock door
Is door latch secure?
Y
Lock door
END
N
Sound alert

Step 4 – Pseudocode

##Psuedocode sketch

START

Check equip status
  If OK
    Continue
  Else
    Send alert -> IT team
    Display warning

Check temp
  Is temp <16 or >28:
    If yes
      continue
    else
      Display warning
      If user -> Exempt
        Allow access
      Else
        Deny access

Card Access
  Is room count >30
  Display count
  If yes
    User -> exempt?

Allow Access

Else

Deny access

Show error

If no

Allow access

unlock -> Door

Door lock check

Has door been open >1min

If yes

Sound beep

continue

If no

Do nothing

Room Capacity Count

If Card scan -> Outside

If access allowed

Room count +1

If Card scan -> Inside

Room count -1

Are the rooms booked in advanced?

If room booking ended >15 minutes ago

Prompt for input

If no input

    Clear room capacity count

  else

    Keep count