

OOOO

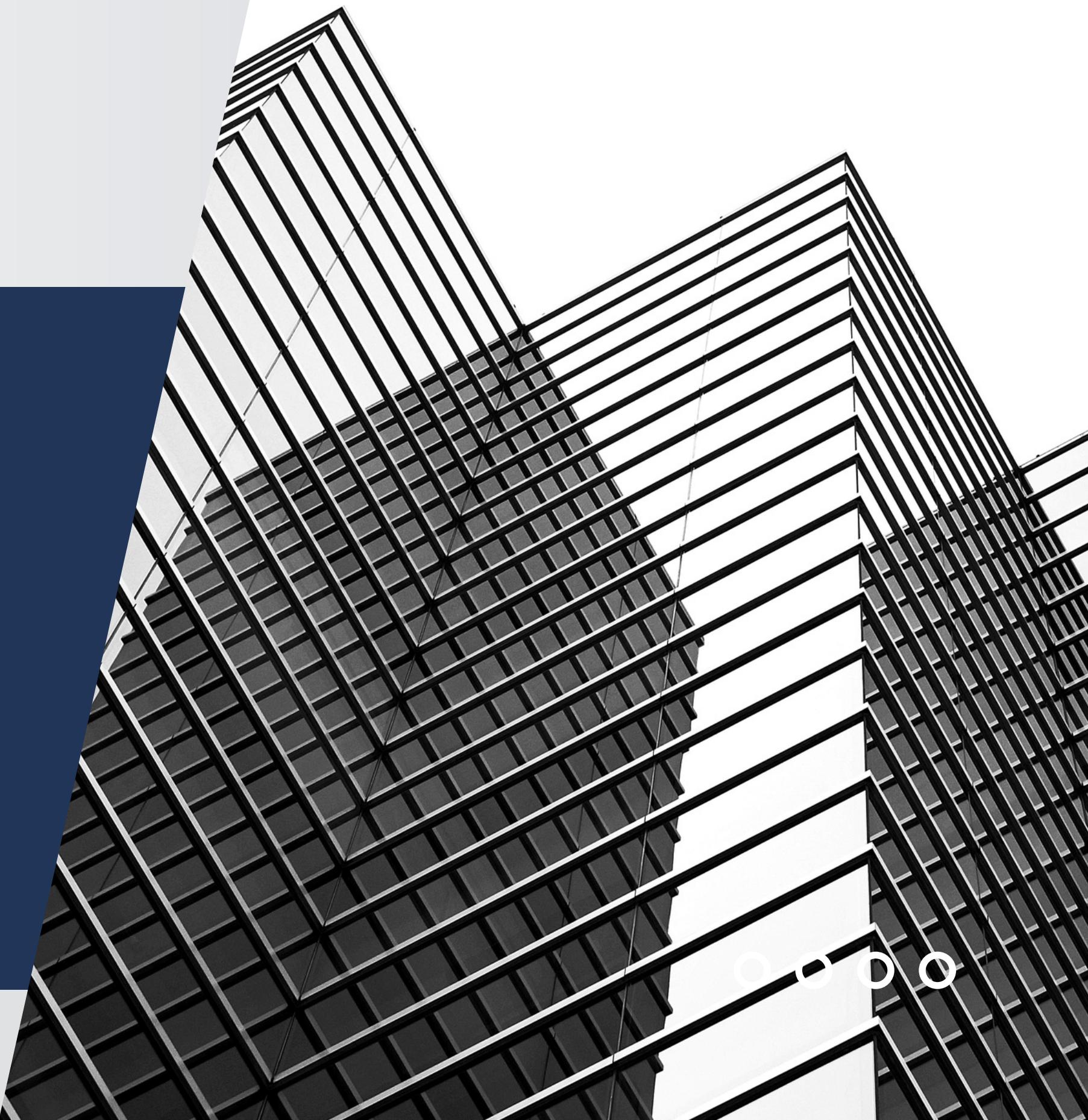
CO326:: COMPUTER SYSTEMS ENGINEERING, INDUSTRIAL NETWORKS
PROJECT SMART BUILDING

CONTROL GROUP

OOOO

CONTENTS

- Introduction
- Conceptual Design
- Server Setup
- MQTT
- Database
- Control Flows
- Conclusion

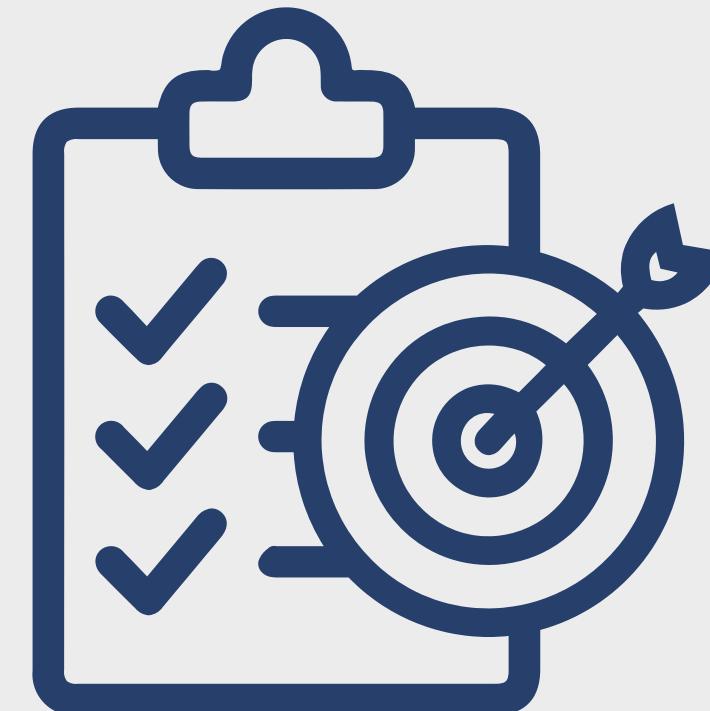


INTRODUCTION

**What is the
Control Group?**



What we do?

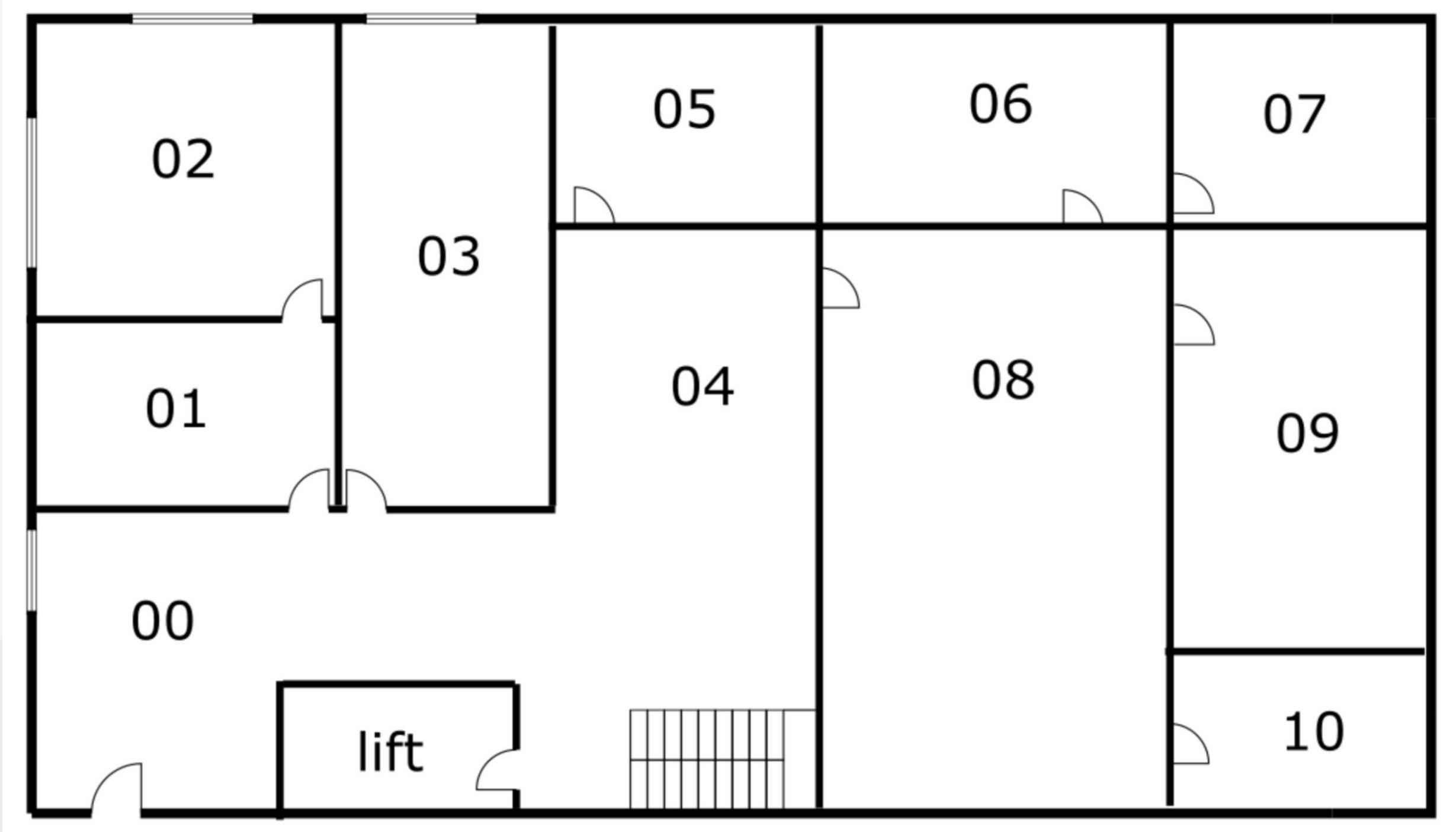


CONCEPTUAL DESIGN

- **Based on the Department of CE building**
- **Placement of the components**
- **System behaviour**



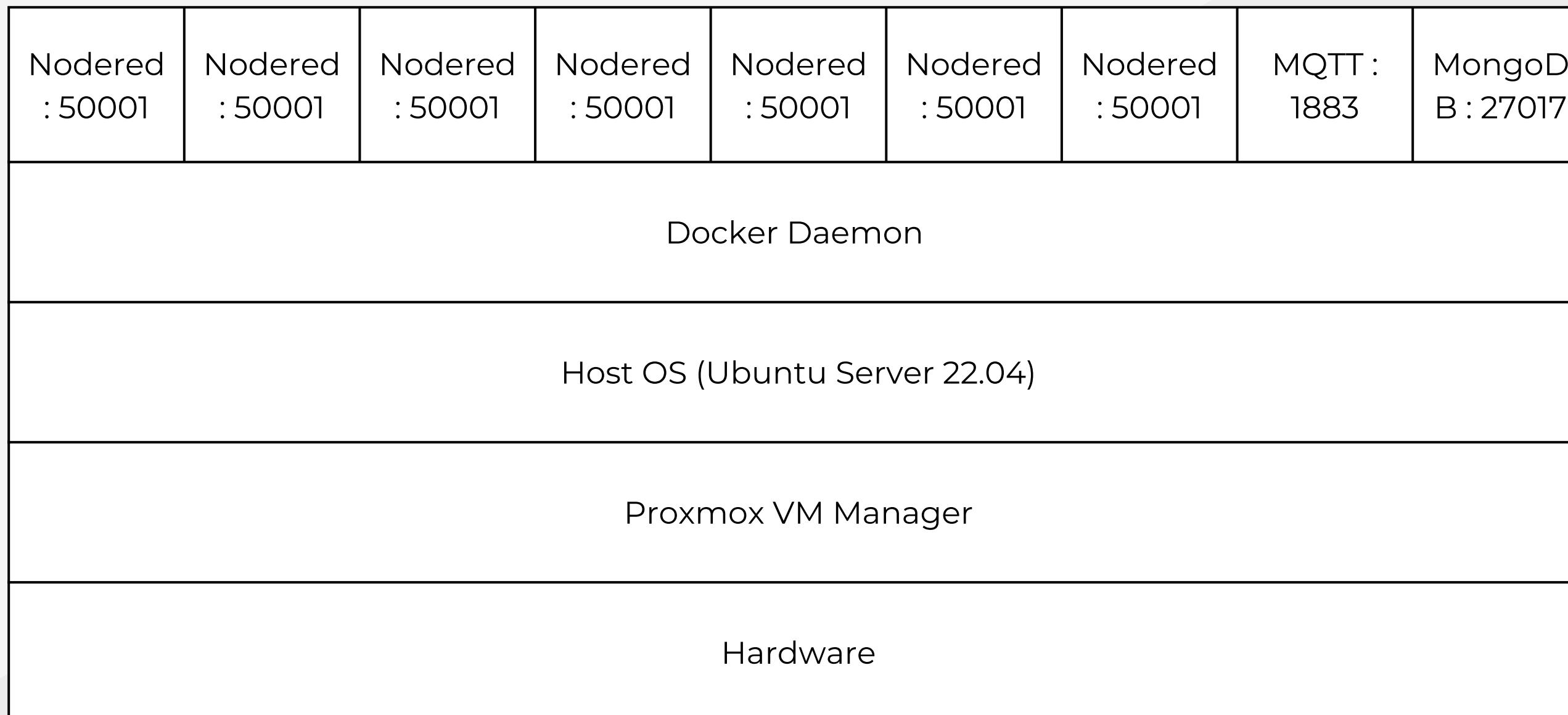
CONCEPTUAL DESIGN



CONCEPTUAL DESIGN

Room_no	Description	Emergency	Sensors	Actuators					
00	Lobby, seating area		THS, I,OC,FD	IND,L,FAL	04	Central Lobby	FE, PS	FD, SD, I	S,IND,L
01	Department Office		FD, I , OC	IND, FAL,L	05	Storage / Filing room	FE, PS	FD, SD, AHU, DPS,THS	L
02	HoD's Office		AHU, DPS,THS	FAL,L	06	Staff Room	FA	FD, SD, AHU, DPS,THS	S,L
03	Conference Room		FD, SD, AHU, DPS,THS, I	S, FAL,L	07	Boiler/Chiller room	FE	FD,SD, THS	B,C
					08	Open Lab / Space	FE, PS	FD,SD, AHU, DPS,THS, I	S, FAL,L
					09				
					10	Washrooms			IND,L

SERVER SETUP



MQTT

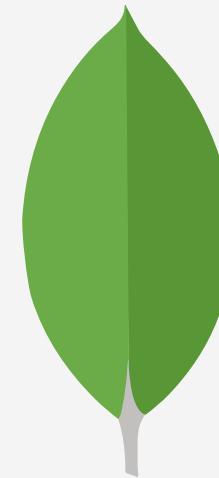
- Standardize and maintain the MQTT topics used by the systems

HVAC	326project/smartbuilding/hvac/
Lighting	326project/smartbuilding/lighting/
Safety	326project/smartbuilding/safety/
Energy	326project/smartbuilding/energy/
Occupancy	326project/smartbuilding/occupancy/
PhotoVoltaic	326project/smartbuilding/pv/

Ex: Topics configured for safety group

326project/smartbuilding/safety/<floorno>/<roomno>/smoke
326project/smartbuilding/safety/<floorno>/<roomno>/fire
326project/smartbuilding/safety/<floorno>/<roomno>/sprinkler
326project/smartbuilding/safety/<floorno>/<roomno>/firealarm
326project/smartbuilding/safety/<floorno>/<roomno>/pullstation

DATABASE



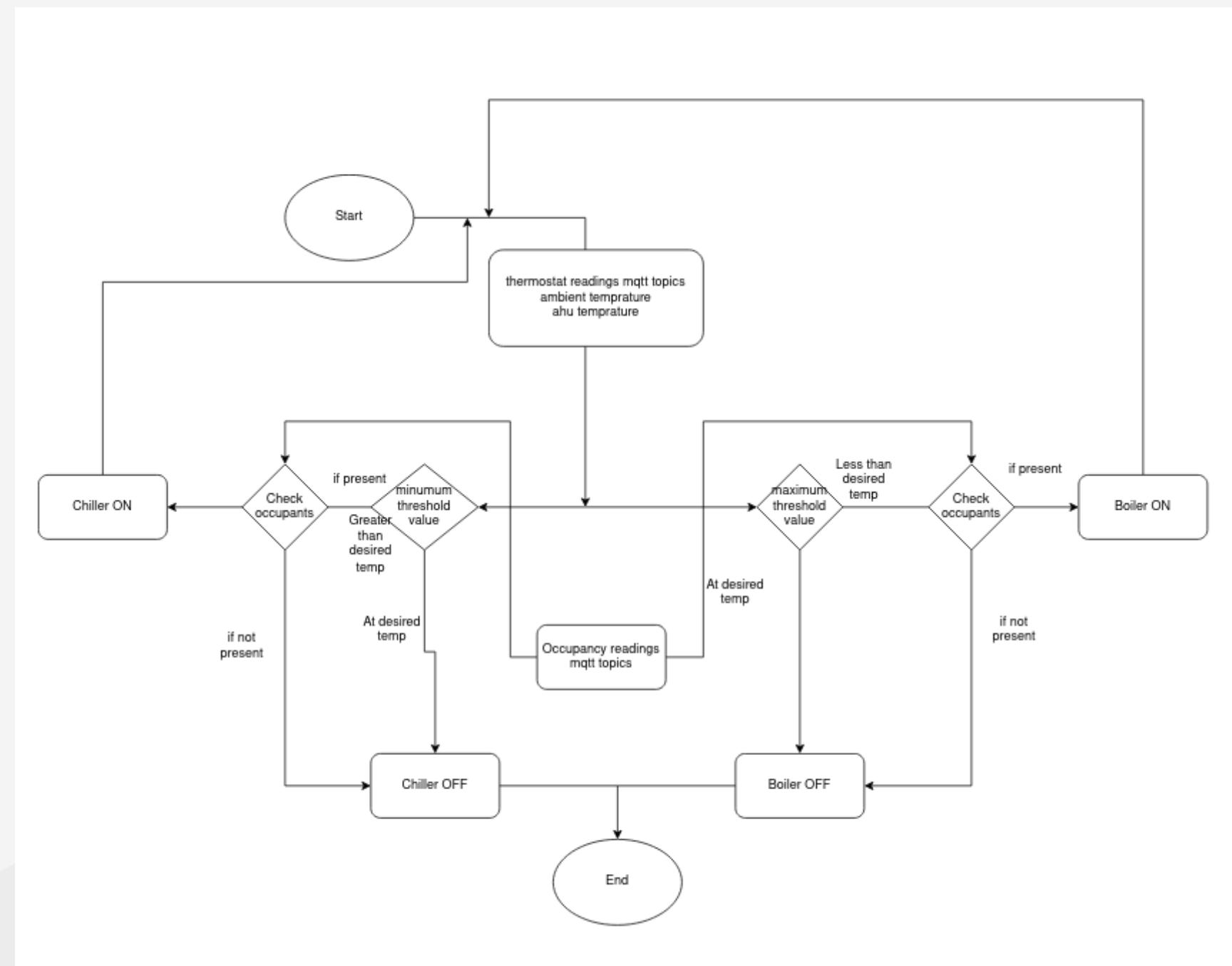
- **Collection naming format**

System	collection name
HVAC	co326_hvac_<xxx>
Lighting	co326_lighting_<xxx>
Safety	co326_safety_<xxx>
Occupancy/Access Control	co326_occupancy_<xxx>
Energy	co326_energy_<xxx>
Photovoltaic	co326_pv_<xxx>

Ex: Collection configured for safety group

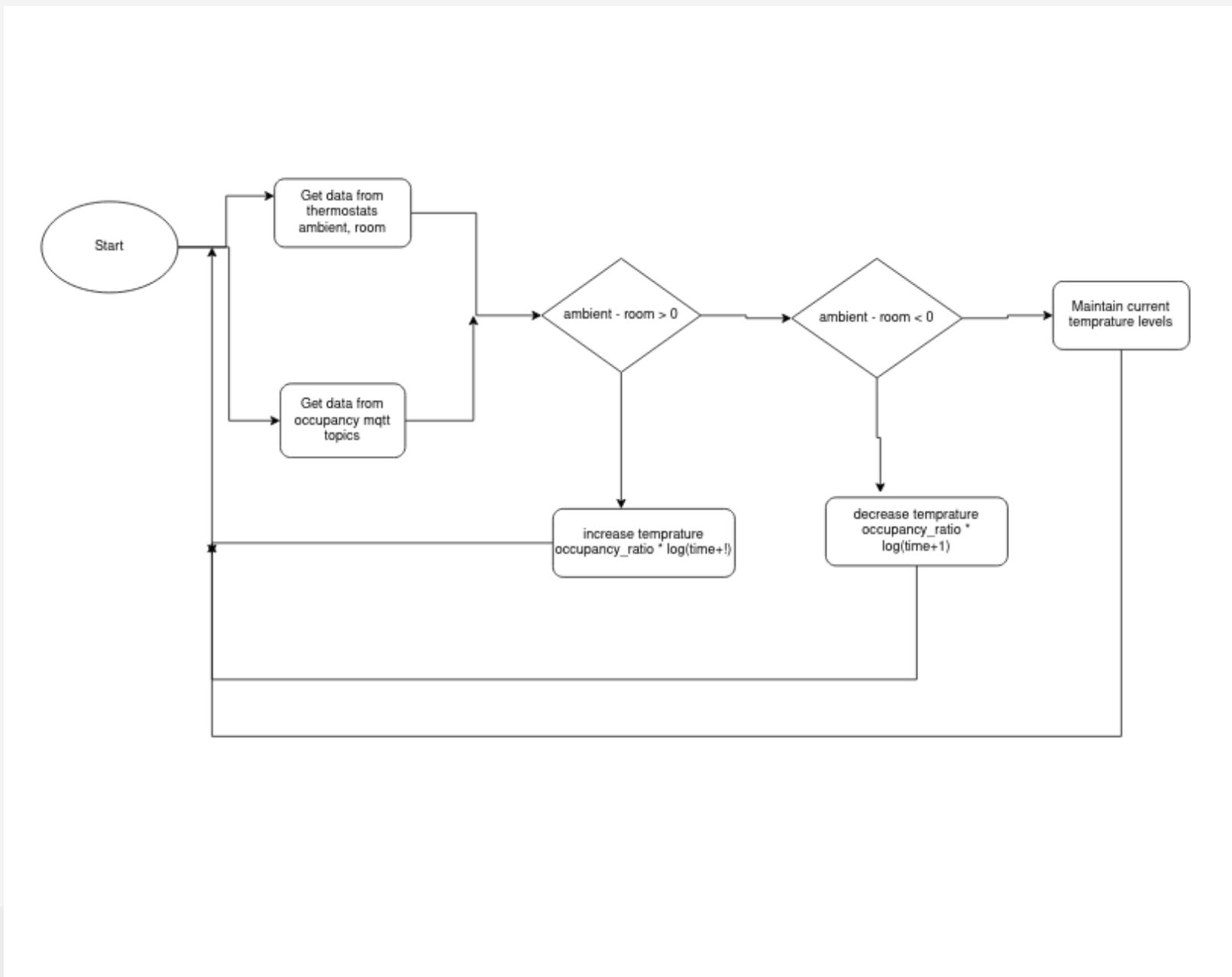
Fire_detect	smoke_level	BOOL	326_fire_detect
Smoke_detect	active	FLOAT	326_smoke_detect
Sprinkler	active	BOOL	326_sprinkler
Fire_alarm	active	BOOL	326_fire_Alarm
pull	active	BOOL	326_pull_station
Voltage	voltage	FLOAT(3,2)	326_voltage
Current sensor	current	FLOAT(3,2)	326_current

CONTROL FLOWS: HVAC-OCCUPANCY



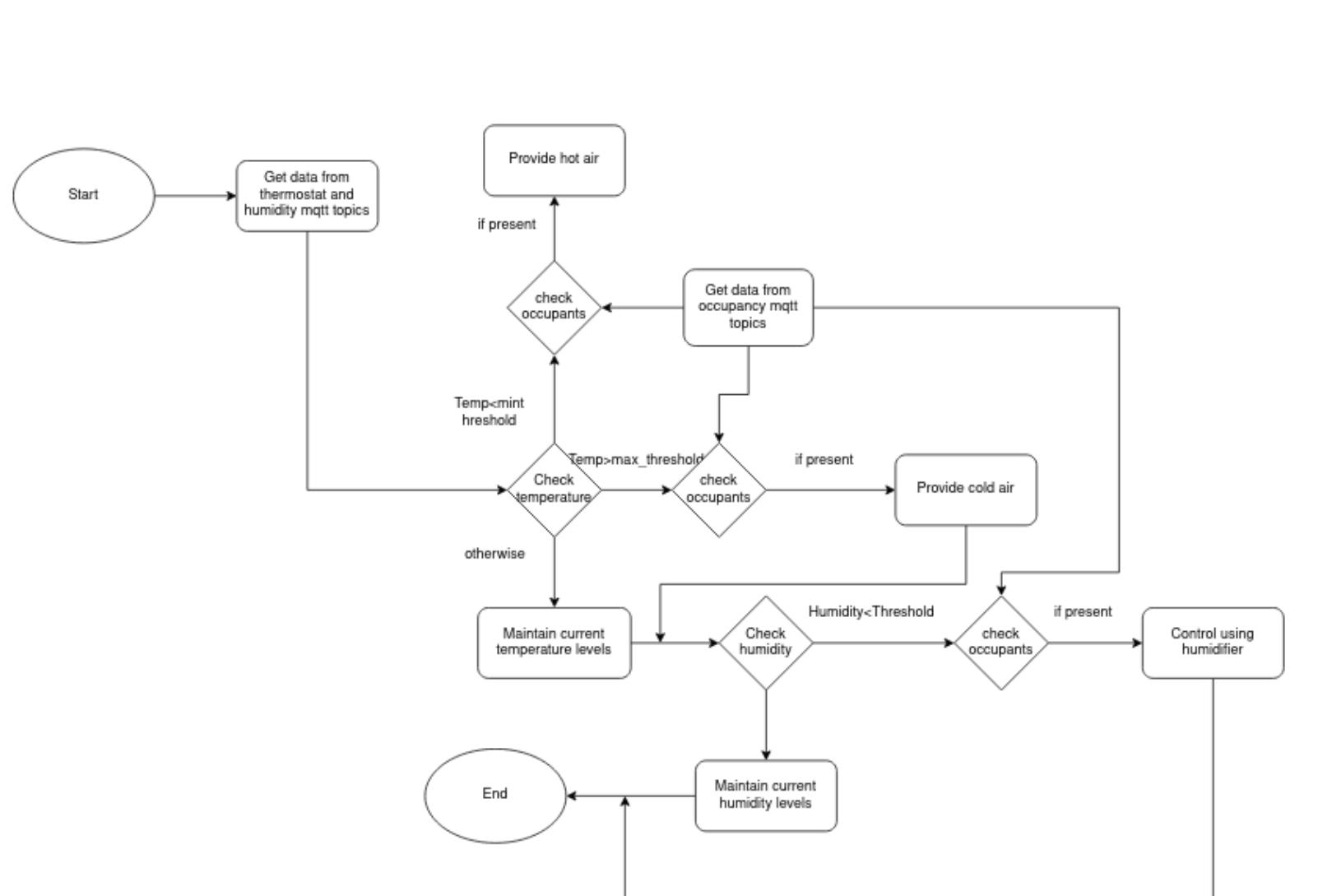
Boiler-Chiller
occupancy
Control Flow

CONTROL FLOWS: HVAC-OCCUPANCY



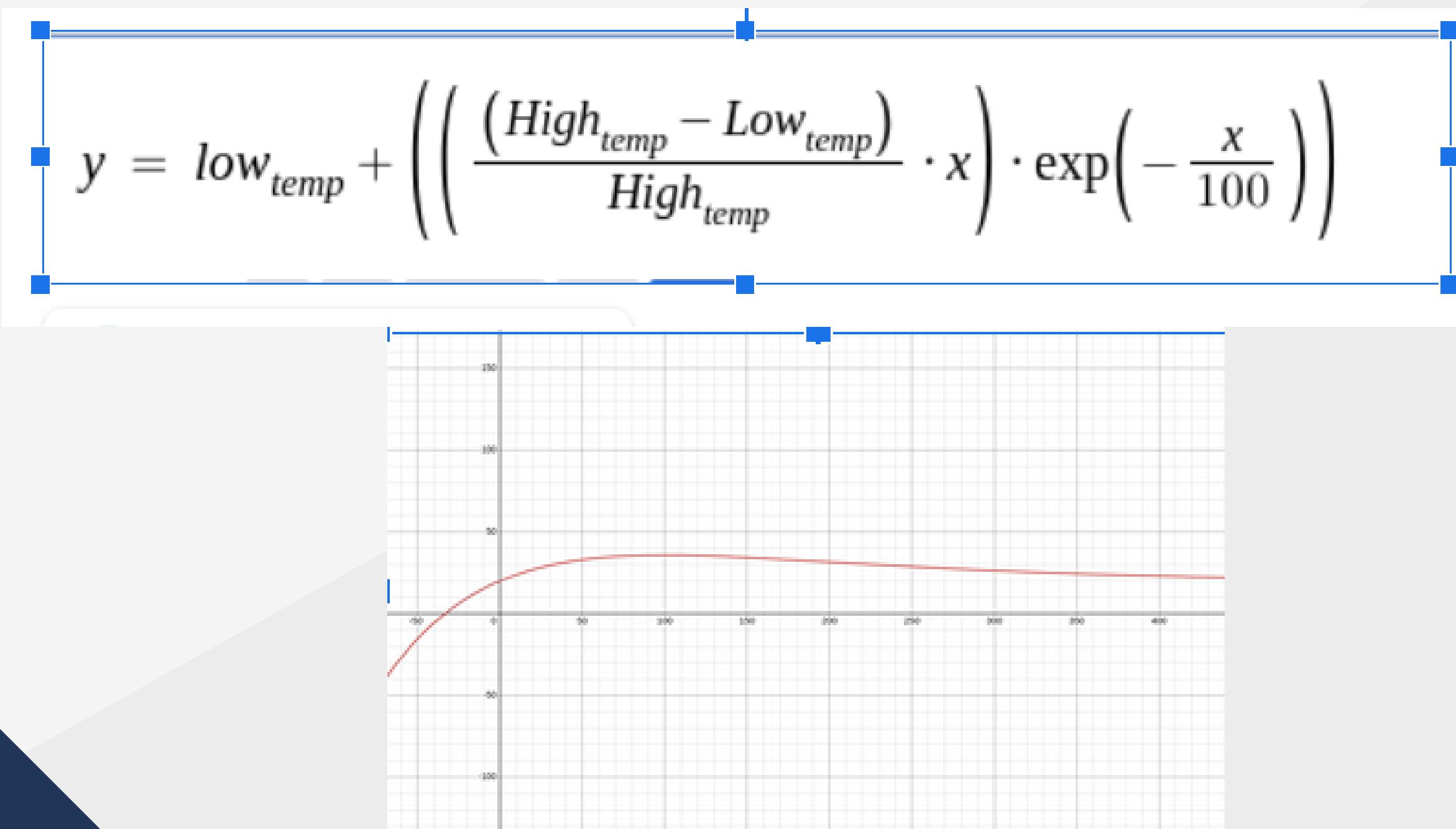
AHU
occupancy
Control Flow

CONTROL FLOWS: HVAC-OCCUPANCY



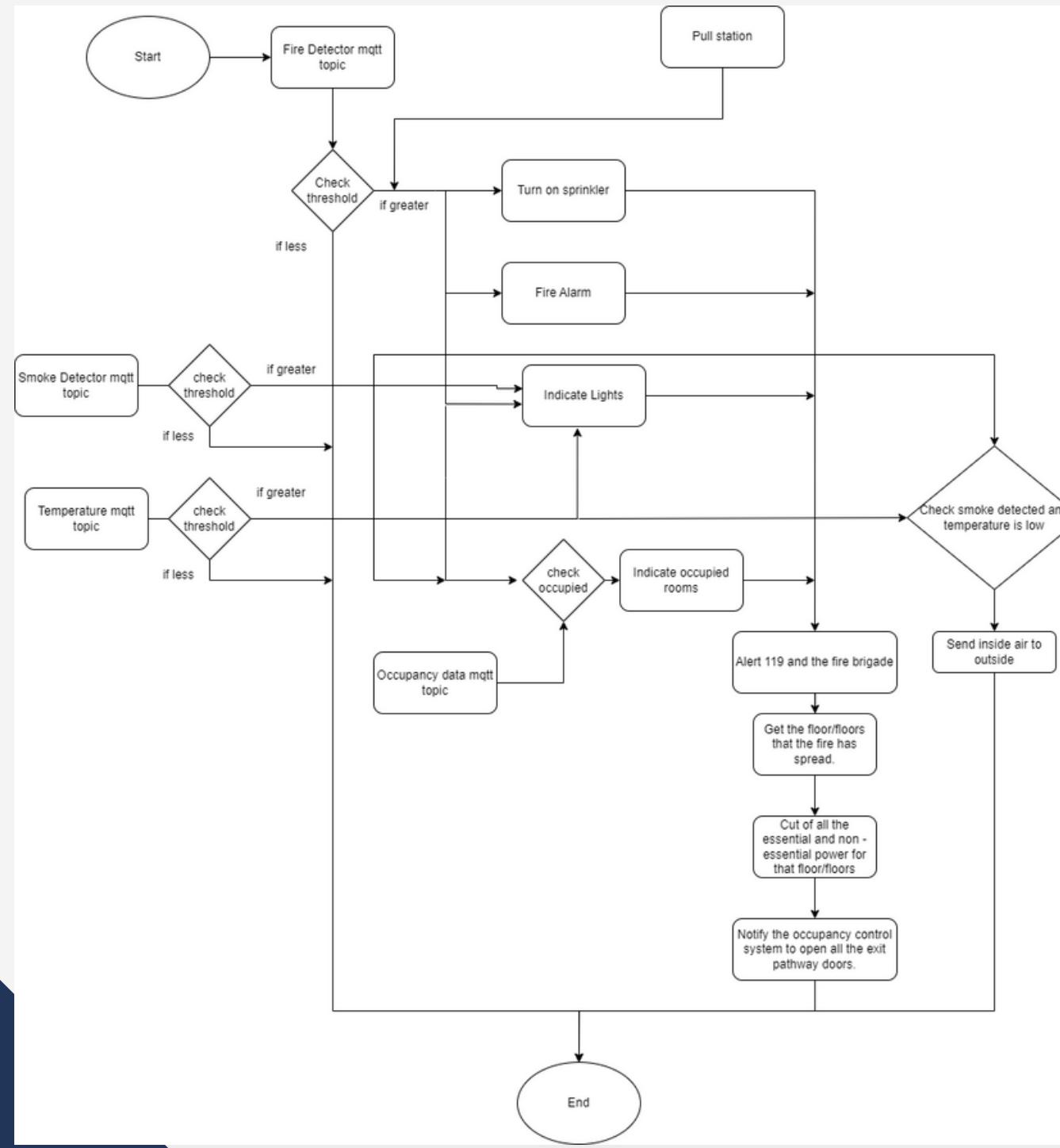
Humidity-
occupancy
Control Flow

CONTROL FLOWS: TEMPERATURE MODEL



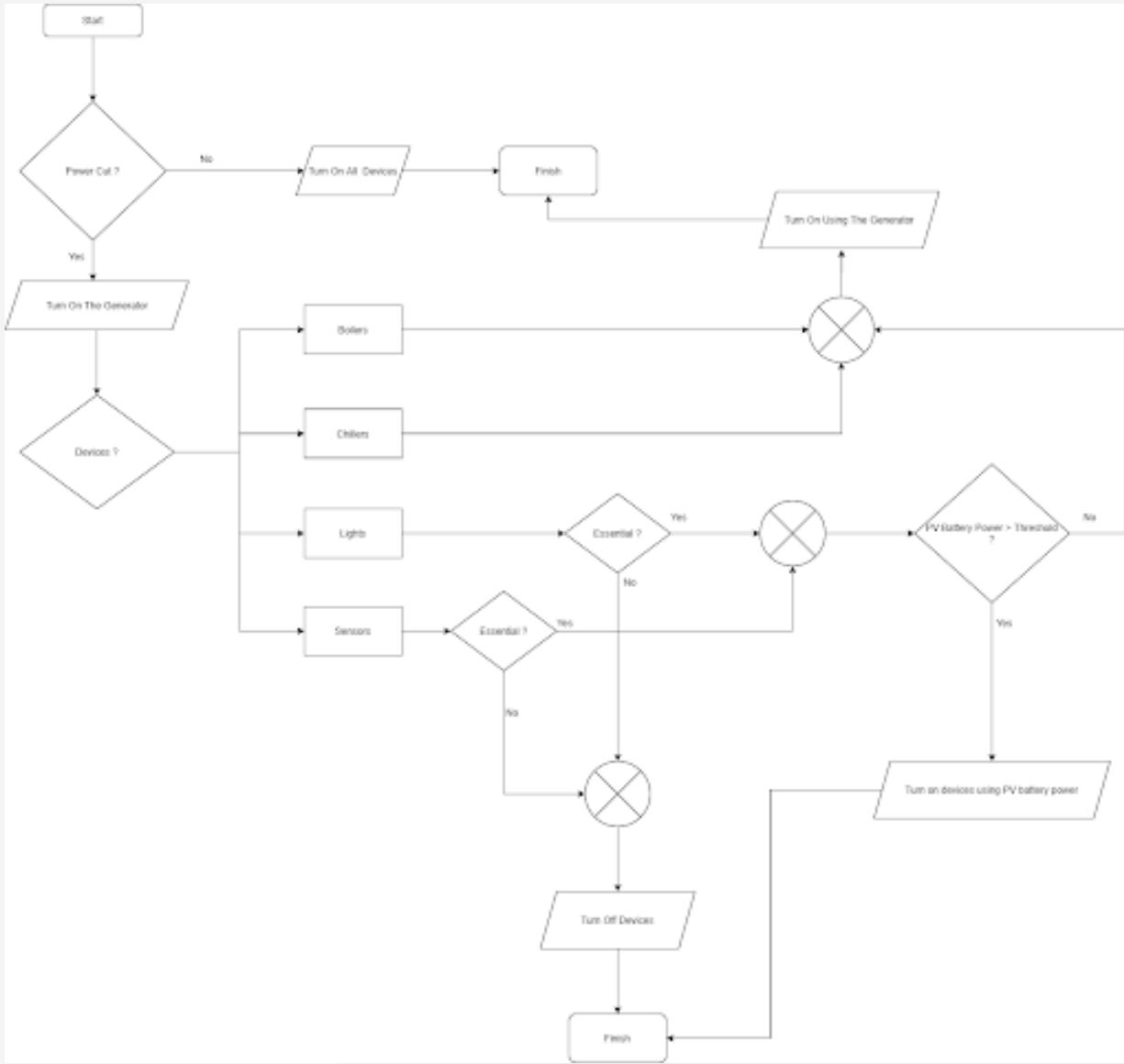
Ambient
Temperature

CONTROL FLOWS: FIRE CONTROL

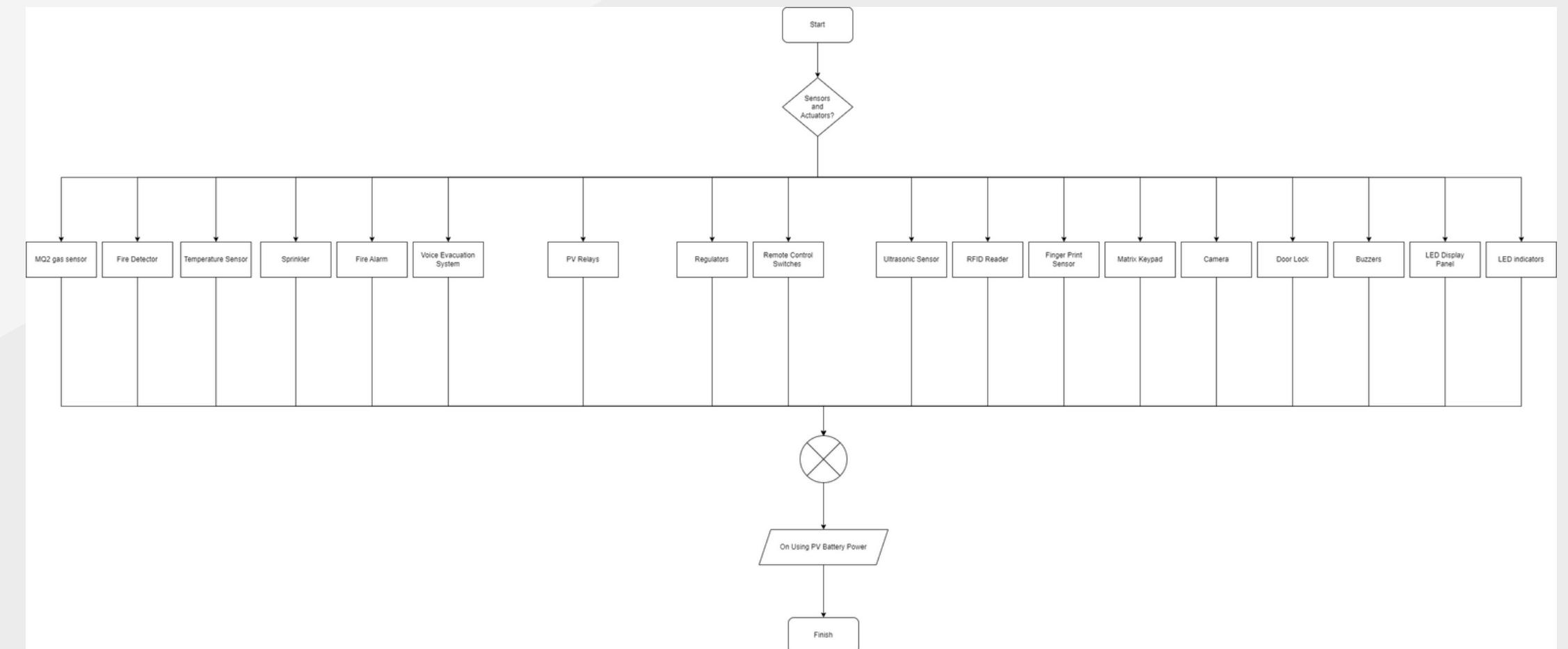


Fire Control Flow

CONTROL FLOWS: ENERGY CONTROL

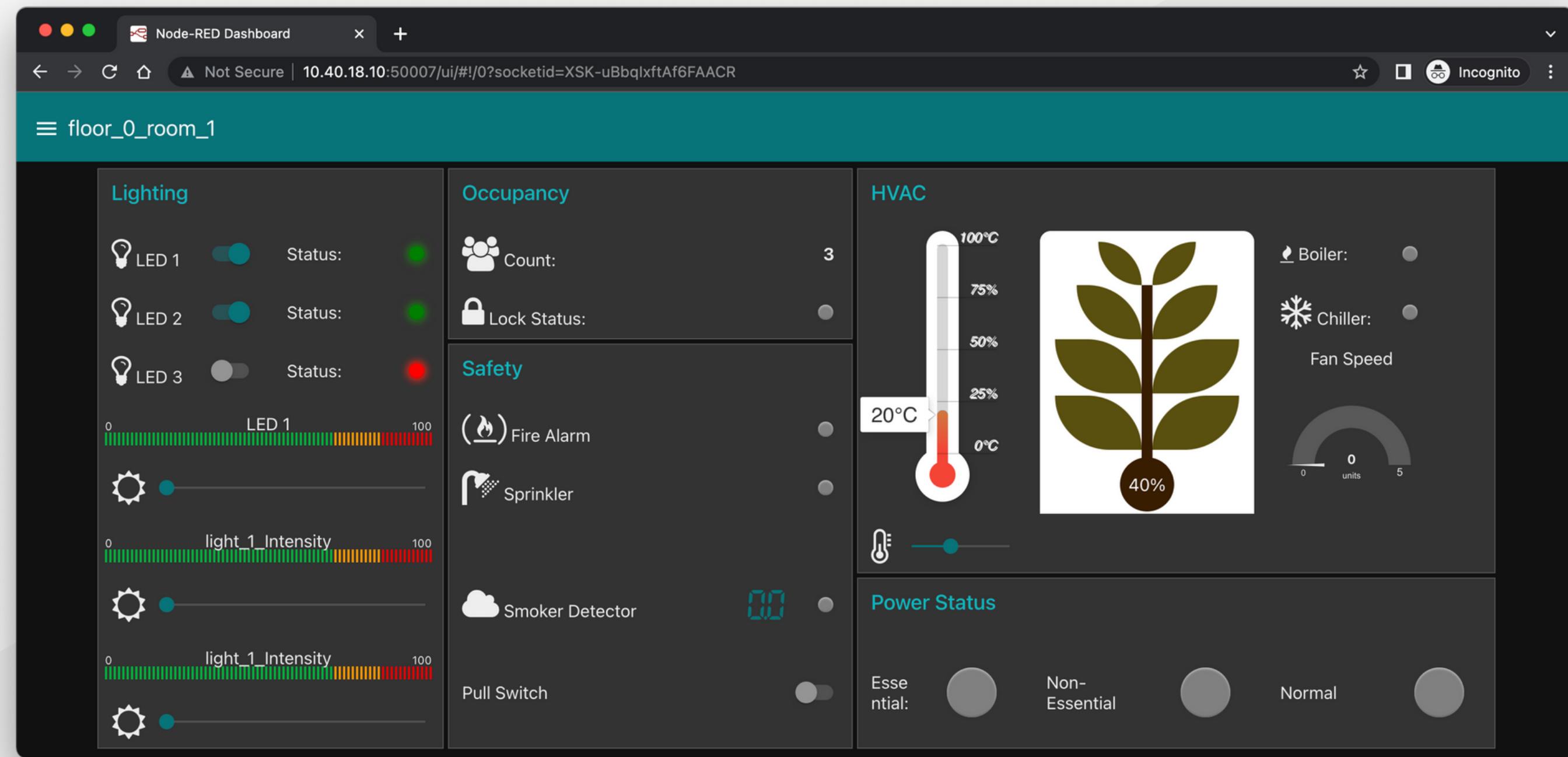


Flow 1 - Control logic for using power

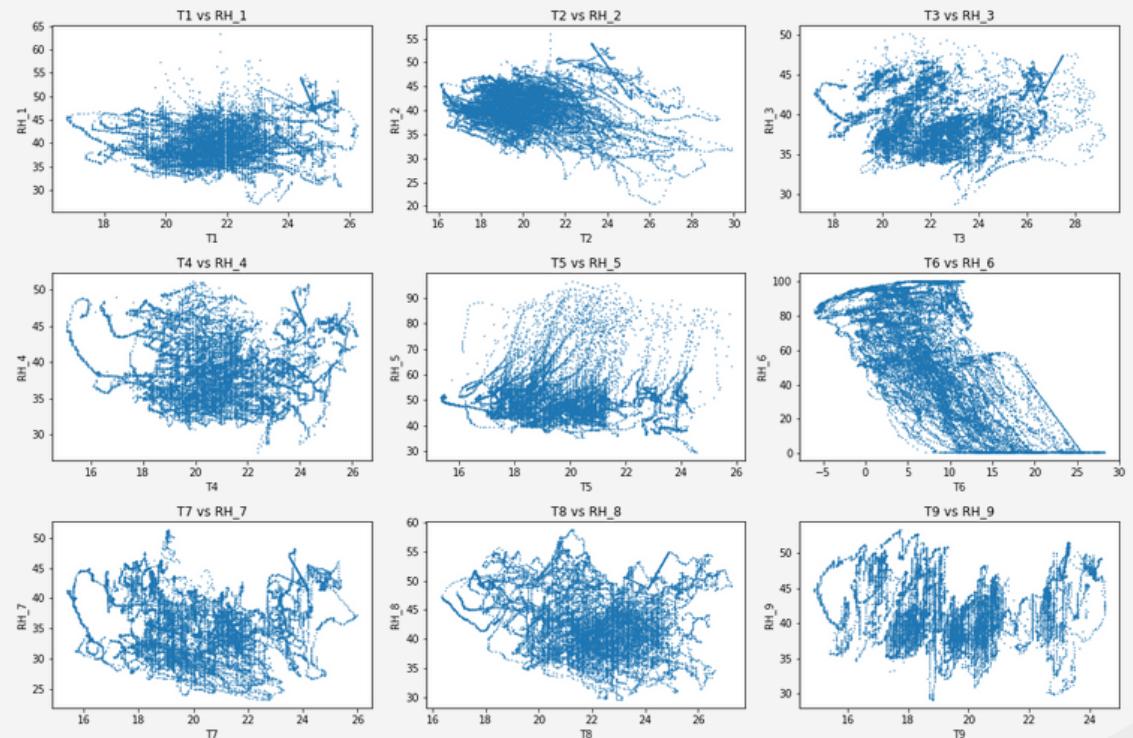


Flow 2 - Components and Power

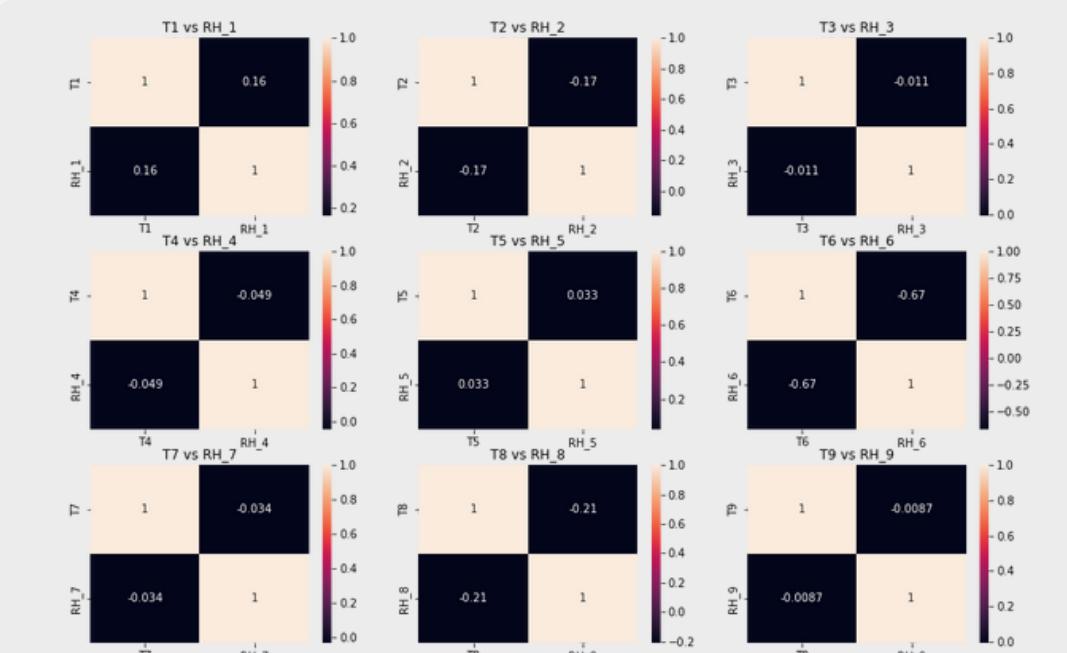
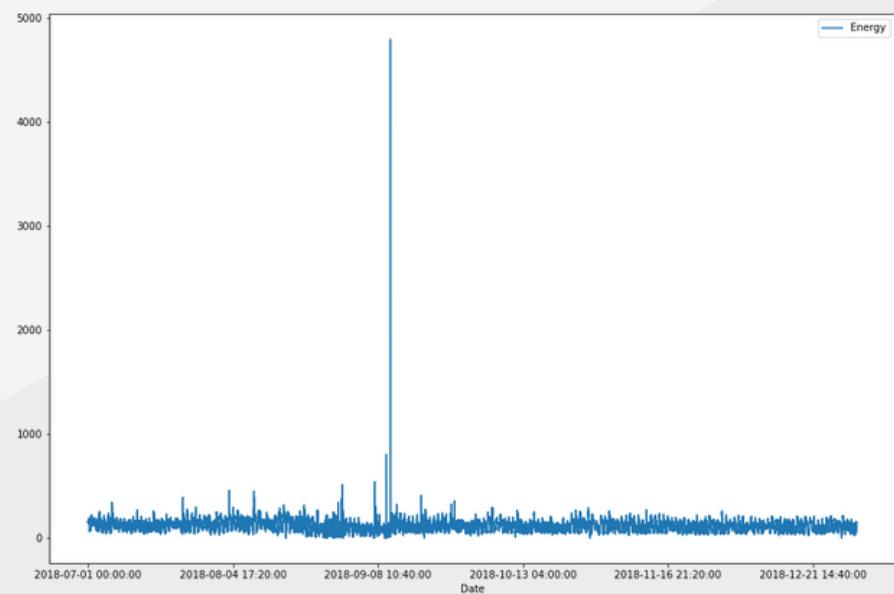
CONTROL FLOWS: DASHBOARD



DATA ANALYSIS



Energy Consumption over time



DATA ANALYSIS



THANK YOU

