

# Home & Building Automation

## Session 4

# Content

- Debate
- Project 2 presentation
- Home-automation buses, standards, and protocols
- Access control with RFID

# Debate

# Project 2: Automate Your Friend's Home

- Floor plans (sorry for the imperial scale)
- I want to know cost and effort
  - all components you need to buy
  - their sources
- Deliverables
  - Shopping list incl. prices
  - Work packages, estimation for execution of these
- 20-30 min presentation
- Scenario!

# Your friend's home: Floor plans (1)



ground floor plan

Taken from: <http://www.houseplans.com/plan/3584-square-feet-4-bedrooms-2-5-bathroom-modern-house-plan-2-garage-37341>

# Your friend's home: Floor plans (2)



first floor plan

Taken from: <http://www.houseplans.com/plan/3584-square-feet-4-bedrooms-2-5-bathroom-modern-house-plan-2-garage-37341>

# Additional Information

## Plan Description

- GROUND FLOOR:

- Study 3.5m x 4m or 11' 6" x 13' 2"
- Living Room: 5.4m x 4.8m or 17' 8 1/2" x 15' 9"
- Dining Area: 4.7m x 3.4m or 15' 5" x 11' 2"
- Family Area: 5.3m x 6.6m or 17' 4 1/2" x 21' 8"
- Garage: 6m x 6m or 19' 8" x 19' 8"

- FIRST FLOOR:

- Bedroom1 3.7m x 6m or 12' 1 1/2" x 19' 8"
- Activity Area 5.2m x 4m or 17' 1/2" x 13' 2"
- Bedroom 2 3.7m x 3.9m or 12' 1 1/2" x 12' 9 1/2"
- Bedroom 3 3.7m x 3.9m or 12' 1 1/2" x 12' 9 1/2"
- Bedroom 4 3.7m x 3.9m or 12' 1 1/2" x 12' 9 1/2"

# Additional Information

## FULL SPECS & FEATURES

Basic Features	Stories : 2 Baths : 2.5	Garage Stalls : 2 Bedrooms : 4
Dimension	Depth : 42' Width : 85'	Height : 24'
Area	Garage Sq Ft : 433 sq ft Total Sq Ft : 3584 sq ft * <i>*Total Square Footage only includes conditioned space and does not include garages, porches, bonus rooms, or decks.</i>	Upper Floor Sq Ft : 1722 sq ft Main Floor Sq Ft : 1862 sq ft
Bedroom Features	Upstairs Bedrooms Walk In Closet	Upstairs Master Bedrooms
Kitchen Features	Walk In Pantry Cabinet Pantry Peninsula Eating Bar	Breakfast Nook Kitchen Island
Additional Room Features	Family Room Keeping Room Den Office Study Computer	Main Floor Laundry Great Room Living Room
Garage Features	Front Entry Garage	
Lot Characteristics	Suited For Narrow Lot	
Outdoor Spaces	Grill Deck Sundeck	Loft Balcony

+ 3000 sqm garden  
with pool  
(don't forget outside Lighting)



# Additional Information

- Check
  - phillips hue
  - alexa, siri, google, mycroft.ai
  - homematic
  - ikea
  - loxone
  - sonoff (itead.cc), obi
  - knx/gira

# Bus&Protocol Research

- Zigbee, Zwave, X10, DMX
- SPI, I2C, Onewire, rs-232/rs-422/485
- KNX-bus/ Ebus, Canbus
- Bacnet, Lonworks, Modbus
- select, study, in teams (50min)
- synthesize a 15-30 presentation in 30 min
- study for example: functionality, effort to use/implement, speed, throughput, latency, length, flexibility, importance, usage example, domain
- present 15-30min each group (next class)
- share publicly

# MQTT and...

- Install MQTT.fx or learn mqtt\_... command line tools of IoTempower
- Build an mqtt accessible component for expiring tickets either externally or in Node-RED (check out integriot python library or paho-mqtt in java)

# ... Access Control System

- Extend existing smart lock system
- Add RFID capability to access-control system  
use MFRC522 from ulno's kit
- Combine with second factor on Node-Red GUI on phone
- Implement an expiring ticket
- Create small scenario in what type of building situation this access control is, describe successful and unsuccessful attempt