Design and implement a house environmental control

## Step One: What?

Modulate Temperature, Humidity, and Illumination specified by the users to within predetermined tolerances.

Control Heating unit

to within +-.5 degrees, runs till inside temp hits user setting

delays for 30 sec. after cycle

Control Cooling unit

to within +-.5 Rh, runs till inside temp hits user setting

delays for 30 sec. after cycle

Control Humidifier Unit

To within +- 5 rh, runs till inside humidity hits user setting

Delays for 5 min. after each cycle

Control Lights

Dimmer controlled LED lights

Control Blinds

Servo controlled venetian blind

Sense Temperature inside and outside

Sense Humidity inside and outside

Sense Illumination inside and outside each blind system

Display relevant messages to user with LCD panel

## Step Two: How?

### User Input

* + Get user input from serial monitor or manual control
  + Cycle through options Heating\Cooling\Illumination with buttons or dial
  + Set value through serial input (command string)
    - “1 090” : set temp to 90 degrees, “2 100” : turn humidifier on
  + Get environmental values from other controls through i2c
    - Incoming and outgoing message variants
      * 0\1 in first character position set incoming or outgoing
      * 1-4 in second position set device
      * Value in third position, temp, humidity, luminosity
  + Show control messages to user through LCD
    - A three-position switch to navigate menu options
    - Button to select or enter
    - Menu to select Temp, Humidity, or Lights
    - Adjust value with switch, button to enter
  + Determine of heating or cooling is available via outside temp sensor on HCH unit
  + If temp is below 70, heating is available, if above 70 cooling at outside sensor

### Heating\Cooling\Humidity

* + Get control messages through i2c
  + Send environmental values through string
  + Turn on\off heater\AC
  + Turn on\off humidifier
  + Sense temperature\humidity inside and outside
    - Inside: DH11
    - Outside: digital temp sensor
  + Delay running next cycle to prevent excessive running

### Illumination

* + Get control messages through i2c
  + Send environmental values through string
  + Sense inside and outside illumination
  + Adjust lighting to within user specs via dimmer switch
  + Open\Close Blinds manually or automatically individually or in a group via servo motor
  + Determine night and day through photoresistor
  + Power blind control motors
  + Individual manual blind controls