Testing Document

# Component testing

To start the testing, I will test each of the components individually, writing a small program for each of the components to use either with the RaspBerry or de Arduino.

1. Servomotor + Arduino
   * Arduino should be able to control the servomotor through PWM
2. LEDs + Raspberry
   * Raspberry should be able to control the lighting of the LEDs through PWM
3. Lighting Sensor + Arduino
   * Arduino should be able to get measurements from the lighting sensor
4. Peltier cells + Relays + Power source + Raspberry
   * Raspberry should be able to heat and cool the Peltier cells
5. Temperature sensor + Arduino
   * Arduino should be able to get measurements from the temperature sensor

# Integration testing

Once I made sure that all the components work, I will start the integration testing

1. Connectivity between Arduino and Raspberry
   * The Arduino and the Raspberry should be able to connect through a Serial port and send information to each other
2. LEDs + Raspberry + Arduino + Lighting Sensor
   * The Raspberry should request information from the Lighting sensor to the Arduino.
   * The Arduino should receive information from the Lighting Sensor and send it to the Raspberry.
   * The Raspberry should compare the information from the Lighting Sensor with a given value and use PWM to turn the LEDs on.
   * The Raspberry should request information from th Lighting sensor again
3. Peltier cells + Raspberry + Arduino + Temperature sensor
   * The Raspberry should request information from the Temperature sensor to the Arduino.
   * The Arduino should receive information from the Temperature Sensor and send it to the Raspberry.
   * The Raspberry should compare the information from the Temperature Sensor with a given value. If the value is less than the measurement, it should turn on one of the Peltier cells.
   * If it is greater than the measurement, it should turn on the other Peltier cell
   * The Raspberry should wait for a few seconds and turn off the Peltier cell
   * The Raspberry should request information from the Temperature sensor again
4. Connectivity between graphic control panel (PC) and Raspberry
   * The Raspberry should be able to receive information from the graphic control panel through a socket and send a wait signal
5. Control Panel + Raspberry + Arduino + Servomotor
   * The Raspberry should receive a signal from the control panel to open or close the door
   * The Raspberry should send a signal to the Arduino to move the Servomotor
   * The Arduino should move the Servomotor accordingly
6. Control Panel + Raspberry + LEDs + Arduino + Lighting Sensor + Lego model
   * The Raspberry should receive the wanted lighting value from the Control Panel through a socket
   * The Raspberry should send a wait signal to the control panel to disable the Lighting Control
   * Using a controller, the Raspberry and the Arduino should repeat the Lighting sensor/LEDs process until the lighting value is met
   * When the value is met, the Raspberry should send a signal to the Control Panel to enable the lighting control
7. Control Panel + Raspberry + Peltier Cell + Arduino + Temperature sensor + Lego model
   * The Raspberry should receive the wanted temperature value from the Control Panel through a socket
   * The Raspberry should send a wait signal to the control panel to disable the Temperature Control
   * Using a controller, the Raspberry and the Arduino should repeat the Temperature sensor/Peltier cell process until the temperature value is met
   * When the value is met, the Raspberry should send a signal to the Control Panel to enable the Temperature control
8. Control Panel + Raspberry + LEDs + Peltier Cell + Arduino + Servomotor + Lighting Sensor + Temperaure Sensor (Full system) + Lego Model
   * All the systems should be working accordingly to their own functions
   * The servomotor should be able to open and close the door