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startup = questdlg('Would you like to activate ecoTECH Smart Home Energy System?'); % Begins
activation sequence of ecoTECH
waitfor(startup);
if startup == "Yes" % If "Yes" is selected an activation sequence begins and enters the while
loop at the end
    power = "on";
    m1 = msgbox('Starting up ecoTECH...');
    pause(2);
    delete(m1);
    m1_wait = waitbar(0, 'Please wait...');
    steps = 25;
    for i = 1:steps
        pause(.1);
        waitbar(i/steps); % Updates the waitbar
    end
    delete(m1_wait);
    PASSCODE = [0 0 0 0]; % Initializes passcode
    ii = 0; % Initializes a variable used to break out of loops
    m2 = msgbox('ecoTECH fully operational!');
    pause(2);
    delete(m2);
elseif startup == "No" || startup == "Cancel" % If "No" or "Cancel" is selected then the
activation sequence doesn't start and doesn't enter the while loop
    power = "off";
    m3 = msgbox('Okay! Goodbye!');
    pause(2);
    delete(m3);
end

% ecoTECH in Action Section
while true
    while power == "on"
        % Mobile Key Section
        while true
            % Collects data about the Roll orientation of the mobile device
            KEY = m.Orientation(3);
            % Collects data about the buttons
            b2 = readDigitalPin(a, 'D2'); % Button 2 (Red)
            b3 = readDigitalPin(a, 'D3'); % Button 3 (White)
            if KEY >= 35 % in degrees
                m4 = msgbox('Welcome Home!');
                writeDigitalPin(a, 'D8', 1); % Turns on the green light
                pause(.5);
                writePosition(s, 1); % Turns the servo to unlock the door
                pause(2);
                writeDigitalPin(a, 'D8', 0); % Turns off the green light
                delete(m4);
            elseif KEY <= -35 % in degrees
                m5 = msgbox('Door Locked!');
                writeDigitalPin(a, 'D7', 1); % Turns on the red light
                pause(.5);
                writePosition(s, 0); % Turns the servo to lock the door
                pause(2);
                writeDigitalPin(a, 'D7', 0); % Turns off the red light
                delete(m5);
                ii = 1;
                break % Exits while loop containing mobile key if the door is locked using the
mobile device
            elseif b2 == 0 && b3 == 0 % Exits while loop containing mobile key to enter passcode
section
                break
            end
        end
    end

    % Passcode Section
    while true
        if ii == 1 % Exits while loop containing passcode if the door was unlocked with the
mobile device
            break
        end
        % Collects data about the buttons

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b5 = readDigitalPin(a,'D5'); % Button 5 (Blue)
b1 = readDigitalPin(a,'D1'); % Button 1 (Black)
b4 = readDigitalPin(a,'D4'); % Button 4 (White)
if b5 == 0 % Starts passcode entering section
    for b = 1:5
        m6 = msgbox('Please Press And Hold A Button');
        pause(2);
        delete(m6);
        % Collects data about the buttons
        b1 = readDigitalPin(a,'D1'); % Button 1 (Black)
        b2 = readDigitalPin(a,'D2'); % Button 2 (Red)
        b3 = readDigitalPin(a,'D3'); % Button 3 (White)
        b4 = readDigitalPin(a,'D4'); % Button 4 (Yellow)
        b5 = readDigitalPin(a,'D5'); % Button 5 (Blue)
        % Replaces the values in the initial passcode one at a time
        if b1 == 0
            PASSCODE(0+b) = 1;
        elseif b2 == 0
            PASSCODE(0+b) = 2;
        elseif b3 == 0
            PASSCODE(0+b) = 3;
        elseif b4 == 0
            PASSCODE(0+b) = 4;
        elseif b5 == 0
            PASSCODE = sprintf('%0f%0f%0f%0f',PASSCODE(1), PASSCODE(2),
PASSCODE(3), PASSCODE(4)); % Turns the sequence of buttons pressed into numbers then converts it
to a string
        end
    end % End of for loop for entering digits for passcode

    if PASSCODE == "2314" % If the passcode entered matches then the door unlocks for
a few seconds then locks
        m7 = msgbox('Welcome Home!');
        writeDigitalPin(a,'D8',1); % Turns on the green light
        pause(.5);
        writePosition(s,1); % Turns the servo to unlock the door
        pause(5);
        writeDigitalPin(a,'D8',0); % Turns off the green light
        pause(.1);
        writeDigitalPin(a,'D7',1); % Turns on the red light
        pause(.5);
        writePosition(s,0); % Turns the servo to lock the door
        pause(1);
        writeDigitalPin(a,'D7',0); % Turns off the red light
        delete(m7);
        ii = 1;
        break % Exits while loop containing passcode after entering the correct
passcode

    elseif PASSCODE ~= "2314"
        writeDigitalPin(a,'D7',1); % Turns on the red light
        m8 = msgbox('Incorrect Passcode! Try Again!');
        waitfor(m8)
        writeDigitalPin(a,'D7',0); % Turns off the red light
        continue % Allows you to re-enter a passcode
    end
    elseif b1 == 0 && b4 == 0 % Exits while loop containing passcode section if you do
not want to enter a passcode
        ii = 1;
        break
    end
end

% Temperature Section
t = 0; % Initial time = 0 seconds
pause(5) % Gives time for the user to turn on the temperature switch
SWITCH = readDigitalPin(a,'D11'); % Collects data about the switch in pin D11
while SWITCH == 0
    SWITCH = readDigitalPin(a,'D11'); % Collects data about the switch in pin D11
    voltage = readVoltage(a,'A1'); % Reads the voltage from the temperature sensor
    temp_C = (voltage.*1000 - 500)./10; % Converts the voltage into temperature in °C
    temp_F = (9/5).*temp_C + 32; % Converts from °C to °F
end

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plot(t,temp_C,'b.')
hold on
title('Room Temperature');
xlabel('Time in Seconds');
ylabel('Temperature');
axis([0,180,0,100]);
plot(t,temp_F,'r.')
legend('Temperature in °C','Temperature in °F')
pause(1);
t = t + 1; % Time counter in seconds

% E-mail Section
b_temp = readDigitalPin(a,'D0'); % Collects the data of the (blue) temperature button
in pin D0
if b_temp == 0
    setpref('Internet','SMTP_Server','smtp.gmail.com');
    setpref('Internet','E_mail','ef230ecoTECH@gmail.com'); % Sender
    setpref('Internet','SMTP_Username','ef230ecoTECH@gmail.com'); % Sender's username
    setpref('Internet','SMTP_Password','Integral_ecoTECH'); % Sender's password
    props = java.lang.System.getProperties;
    props.setProperty('mail.smtp.auth','true');
    props.setProperty('mail.smtp.socketFactory.class',
'javax.net.ssl.SSLSocketFactory');
    props.setProperty('mail.smtp.socketFactory.port','465');
    sendmail('jeoayou@vols.utk.edu','ecoTECH Room Temperature',sprintf('The current
room temperature is %.1f °C or %.1f °F.',temp_C,temp_F)); % Sends an e-mail to the recipient
giving data on the current room temperature
    fprintf('E-mail successfully sent!\n')
end
if temp_F >= 75 % If the room temperature increases to 75 °F...
    temp_AC = 65; % Changes the temperature on the thermostat to 65 °F
elseif temp_F <= 65 % If the room temperature decreases to 60 °F...
    temp_AC = 80; % Changes the temperature on the thermostat to 80 °F
end
end % End of "SWITCH == 0" while loop
if power == "off" || ii == 1 % Exits "power == on" while loop
    break
end
end % End of "power == on" while loop
if power == "off" || ii == 1 % Exits entire while loop
    break
end
end % End of entire while loop

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