Physics 37100 Advanced Physics Laboratory I Lab #4

(PART I: Wait for it...)

- 1) Create a sketch that waits for the letter '?' over the serial port. When it receives '?' it will send back 'K' and turn on and LED.
 - a. Set a poll time of 200 µs using delayMicroseconds() to check Serial.available().
 - b. Use Serial.read() to examine each character that is sent. If the character is not '?' then continue to wait.
 - c. Test the sketch using the serial monitor.
- 2) Convert the sketch into a function waitFor().
 - a. waitFor should take 3 inputs:
 - i. A character to wait for.
 - ii. A poll time, which should default to 200 µs.
 - iii. A time out period, which should default to 60e6 µs.
 - b. waitFor should output true if it reads the character and false if the time out period expires.
 - c. Rewrite and test the sketch from 1) using your new function waitFor('R').
 - i. Try waiting for other characters.
 - ii. Test the defaults and overrides.
- 3) Make a Matlab script that sends the character '?' over the serial port.
 - a. using code similar to this:

```
% Make sure to use the same number for baud that you used
% for Serial.begin(9600) in your sketch.

s=serial('COM8','baud',9600); % Create serial object
fopen(s); % Open serial port
pause(2); % Wait for port to open

fprintf(s,'?'); % Send character '?'

%% Always close -- use: fclose(instrfind);delete(instrfind)
% to close orphans
fclose(s);
delete(s);
clear s;
```

- b. Test to make sure the LED only lights when '?' is sent.
- 4) Add code to the matlab script to wait for the character 'K' to be sent over the using fgetl() (type "doc serial/fgetl" for info).
- 5) Using the code developed above we have a way to establish communications between matlab and the arduino. It is like a short conversation: matlab asks '?' == 'Are you ready?' and arduino responds 'K' == 'Yes, I am OK.'.
 - a. Save the sketch and matlab script to send with your report.