1E Pre-Lab Assignment
(due by Mon/Tue Lab)

1E Pre-Lab: Python & Arduino Training

- **Python: (~40 min.)**
  - Watch Python Video #1 how to bin your data and plot Histograms.
  - Watch Python Video #2 for plotting 2 histograms on the same plot.
  - Complete Python Notebook on Histograms and Gaussian.

- **Arduino: (10 min.)**
  - Watch Video #1 on how to setup LED reaction time experiment

1E Pre-Lab: Your Reaction Time

- Please try a simple online test of Reaction Time. (10 min.)
  - https://www.mathsisfun.com/games/reaction-time.html
  - Write down your reaction times (5 x 4 = 20 times).
    - You are going to automate this experiment by Arduino.
    - Did you get the fastest for the last one (with a big circle)?
      - My fastest time was both on the big circle and the normal circles

Times: 0.308s, 0.285s, 0.273s, 0.32s, 0.272s, 0.269s, 0.266s, 0.32s, 0.304s, 0.255s, 0.289s, 0.269s, 0.256s, 0.287s, 0.29s, 0.284s, 0.286s, 0.283s, 0.255s, 0.284s

What is Reaction Time?

- Reaction Time is the fundamental time scale of our decision making process, starting from an external stimulation, resulting in an action (= muscle contraction).
  - As an example, read this article of hitting a fastball.

- For more professional scientific studies, please read two papers below:
  - A comparative study of visual and auditory reaction times on the basis of gender and physical activity levels of medical first year students
  - Jain et al. (2015)
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4456887/

  - Factors influencing the latency of simple reaction time
  - Woods et al. (2015)
  - https://www.frontiersin.org/articles/10.3389/fnhum.2015.00131/full

LED Mean: 226.08620689655172
LED Std. Deviation: 61.692307820611276
Buzzer Mean: 211.135593220339
Buzzer Std. Deviation: 65.48190528354641