<p style="text-align:center">Spring 2022</p>

CPCS-223 Project

CLO 13: Apply empirical techniques to assess and report the performance of one or more algorithms.

Compare two approaches to partition in *quickselect*: Sedgewick (slides) and Lumoto (textbook). Assume that the numbers range from 0 to 100. Use the recursive version of *quickselect* from class slides. Always select the median at $\left\lfloor \frac{l+r}{2} \right\rfloor$ regardless of even/odd array size.

Even though you need to suggest a preferred metric, you <u>must collect both</u> operation count and timing data. Check if both measurements do indeed have the same order of growth.

Required Deliverable

1. Working experiment code to be uploaded separately
2. A report on an empirical study including:
   - Algorithms (do not retype textbook/slides algorithms, just reference figures)
   - Your study design including inputs, procedures, tools, and decisions
   - Findings including discussion of results, an investigation of the order of growth of empirically obtained measurements, and comparison to theory
   - Conclusions

Submission and Grading

Project is worth 20% of final grade. Check scoring rubric for evaluation criteria. Students who help in the course group will receive bonus points. Look for a topic titled Project Discussion.

> - Upload code as `0.js` by midnight Sunday May 1, 2022
> - Upload PDF of printed report by midnight Sunday May 15, 2022
> - Check rubric for policy on late submission

Rules and Specifications

1. Use Section 2.6 as a guide to required work.
2. Use Javascript and Firefox programming environment.
3. Do not share your report. Share ideas and solutions, never words. Similar reports will get F.
4. You are encouraged to ask questions, share answers, and help in the course group.

Code Sharing

Only share code fragments (pieces), not full functions. Never full project code.

Useful Hints

- The scoring rubric can help to smartly manage your time and efforts.
- Recall from Chapter 2, either graphs or limits could be used to investigate order of growth. Excel can be used to empirically investigate limits as n increases (check class slides).