NPRE 555 Fall 2023
CP 02 Due 2023.11.17

- Show your work.
- Please submit your assignment online via github classroom at `https://classroom.github.com/a/xa_ZdqNb`
- All code must be version controlled with git.
- You may discuss your process with your peers, but your implementation and code should stand alone. This assignment is individual work.

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1. (30 points) An infinite bare slab of moderator has thickness 2a. It contains uniformly distributed sources emitting Q $\frac{n}{cm^3 s}$. Write a computer program to solve for the flux:
   (a) Using the P_1 approximation and Marshak boundary conditions
   (b) Using the P_1 approximation and Mark boundary conditions
   (c) Using the P_3 approximation and Marshak boundary conditions
   (d) Using the P_3 approximation and Mark boundary conditions

   Plot the results to compare the approximations and to compare the boundary conditions.
2. (30 points) Report on your results with sufficient clarity to reproduce your work.
   (a) This should include a clear README describing how your instructor can replicate your flux distribution plot and multiplication factor.
   (b) A report document (in .pdf format) should include a 4 page description of your method, results, and observations of the work. Scanned handwritten documents will not be accepted. The report must be generated by a typesetting program (Markdown or LaTeX generated documents are preferred but Word, Open Office, Google Docs are allowed).
3. Employ good software practices.
   (a) (10 points) Use functions, data structures, and classes appropriately.
   (b) (10 points) Document your code clearly, using informative variable names, documentation strings, inline comments, and function call definitions.
   (c) (10 points) Include a license. Consider BSD-3, a permissive open source licence that requests attribution only. Dr. Munk recommends using `https://choosealicense.com/appendix` to choose a license if you would like to make your own selection.
   (d) (10 points) The code should be well organized, readable, and runnable.