CPS363 - 2025 Spring - Midterm#12

DUE DATE: Apr. 16th (Wed.) no later than 11:59 PM EST via email or GitHub

REQUIREMENTS

- Individual work
- **Print name** is required.
- The submission file should be titles: `CPS362_2025_Spring_Midterm#2_[PRINT NAME].zip/others` .
- All submissions will be sent to Fanchao (fmeng@misericordia.edu) via **emails** or GitHub repo. Fanchao will confirm each submission.
- **Late submissions are NOT accepted** unless you have the permission from Fanchao.

Problems (100 points in total)

1. (50 pts) Why the Gram-Schmidt algorithm is never preferred in the eigenvalue revealing problem? Please argue it from the condition perspective.

2. (50 pts) Give a numerically stable algorithm to compute eigenvalues, and show it in a concrete example (e.g. on a 3-by-3 matrix) step by step (both manual work and programs are acceptable), and argue why it is stable.