

A. Full Name: Minh Anh Ton

Project Title: Tile Flip

B. GitHub URL: <https://github.com/ByunTaeyeon02/IndividualCS161>

C. Milestones with deadlines:

- a. **M1 (2/6 - 2/15):** Setting up Github and Flask App
- b. **M2 (2/20 - 2/29):** Add log-in, sign-up, and log-out
- c. **M3 (3/5 - 3/14):** Build 5x5 tiles and generate patterns
- d. **M4 (3/19 - 3/28):** Add "flippable" tiles and a record number of incorrect flips
- e. **M5 (4/2 - 4/11):** Implement an algorithm to solve tile without using help from the database
- f. **M6 (4/16 - Finals):** Testing for bugs and making visuals a little bit better

D. Front-end: Svelte, Tailwind, Javascript, CSS, HTML

Back-end: Flask, Python

E. Algorithms/AI schemes used in the core engine: Generating Puzzle: for each tile in the 5x5, use a random number generator to determine if the square is black or white

- a. **Solver:** Start with the highest numbered "line" and flip in the possible tiles to black
 - i. **Ex:** a line with 4 would mean that the center 3 out of 5 tiles will need to be flip
- b. Once there are no more lines that are higher than 3, go through each line and mark the tiles as white if number conditions are meet
 - i. **Ex:** if the number condition for the line is 5 and all 5 tiles on that line are black then the line is done
 - ii. **Ex 2:** if the line is 3 and three of the five tiles are black then mark the other 2 non-black tiles as white
- c. If a line has a a black tile next to a white one then starting from that black tile add n - 1 numbers of tile (n being the number condition)
 - i. **Ex:** let w be white, b be black, and g be gray (unmarked):
 - ii. If n is 3: w b g g g --> w b b b w
 - iii. If n is 4: w b g g g --> w b b b b

F. Marketplace / Selling point: A 5x5 simple tile game with free hints and self-solving features