CIS 552 Project proposal

- Group members: Garrett Hill
- Github ids: gahill18
- Project title: Targeted Property Based Testing

1. Overall goal

I plan to produce a library for targeted property based testing (PBT). This library will work on top of existing QuickCheck implementation. The targeted PBT will be designed to find counterexamples in significantly fewer tests than traditional random PBT, provided the end user has provided the correct arguments to the exposed methods (utility function, neighborhood function, etc).

2. Use case

In addition to a trivial example using integers, I plan to implement a Wordle/Mastermind solver to demonstrate properties related to how much information is gained in a given guess.
If I achieve this goal early, I will further pursue testing the correctness of information control flow mechanisms.

3. Project architecture

My project will be composed of two (or three if stretch goals are pursued) main parts. The first part is the library functionality of targeted PBT, which will be in one file with a very trivial integer example. The second part will be the more rigorous demonstration of Wordle and IFC proving abilities, which would be in a separate examples file.

4. Testing

In my project, I will test that every guess in a Wordle puzzle produces a certain amount of information (the formula for which I have not yet determined, but information theory equations are mostly just copy/pasted from library functions). Additionally, I will test that all of my sample utility and neighborhood functions produce logically valid results (i.e. all Wordle guesses in the neighborhood of another are at most one letter different).