Background and Context

Evolutionary algorithms that develop something based on fitness and mating in a similar way to natural selection. Using these we are able to come up with nontrivial solutions to problems that have an unclear solution path. The problem we are trying to address is: Can we evolve an airfoil in order to maximize the coefficient of drag/lift?

For this architectural review, we are interested to see how the intuition people have about airfoils compares to the airfoils our algorithm develops. More specifically, we intend on allowing people to play with the equation we are using to define an airfoil in order to "design their own" optimized airfoil. Further, we will implement the aspects of an evolutionary algorithm on the foils they develop. The intent is people will develop a better understanding of evolutionary algorithms and give more educated feedback on the process our algorithm follows. We can also use this to consider what people regard as a "better airfoil" and how that compares to our fitness function.

Key Questions

1. How should we weigh each of the options for the genetic algorithm?
2. How did the airfoil you developed using intuition compare to the foils we have evolved?
3. Which process (mutation or crossover) yielded a better foil?
4. Based off this activity, how should we weight the process of mutation v.s. crossover? Which should contribute more to developing a new population?
5. What comments do you have on our implementation of an evolutionary algorithm's fitness function based on your insights from the "Evolving Your Own Airfoil" activity?

Agenda for Technical Review Session

Time	**Planned Activity**
2 Minutes	Background on Airfoils
10 Minutes	Evolve Your Own Airfoil and Discussion
3 Minutes	Our Version of the Algorithm
5 Minutes	Questions

Feedback Form

Our feedback form is linked below:
https://forms.gle/b4SBEVbJGnRXY5Bb6

Program Architecture