APPM 4600 - Lab 3

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Part 3

- Bisection Method
  - What does the Bisection Method do?
    - The bisection method takes a function along with an open interval and (given a sign change present) iterates by cutting the region in half a series of times, to find a zero with the region.
  - What is required for the Bisection Method to work?
    - For the Bisection Method to work there needs to be a sign change present within the given interval. If not present, the algorithm does not know what to look for and thus will return an error.
- Fixed Point Iteration
  - What problem is fixed point iteration trying to solve?
    - The fixed point iteration method is attempting to find the point of intersection between the given function and the line y=x (i.e. we want to find where the input of the function matches the output).

Part 4

- Question 1:
  - For the first and third interval, the method was successful, finding the zero very close to 1 (within the given tolerance), however for the second interval the method failed. This is because the zero it is attempting to find (x=0) is a root, but because it is squared there is no sign change, and thus it is impossible (by the bisection method) to find that root.
- Question 2:
  - As expected (based on the same reasoning from question 1) part a) was successful, and the first interval of part c) was successful, but part b) and the first interval of c) failed. This was due to the lack of sign change or (in the case of the second interval of c)) a lack of a zero altogether.
- Question 3:
  - Did not finish in Lab