IE 310: Homework 2 — Due:March 8st 23:59

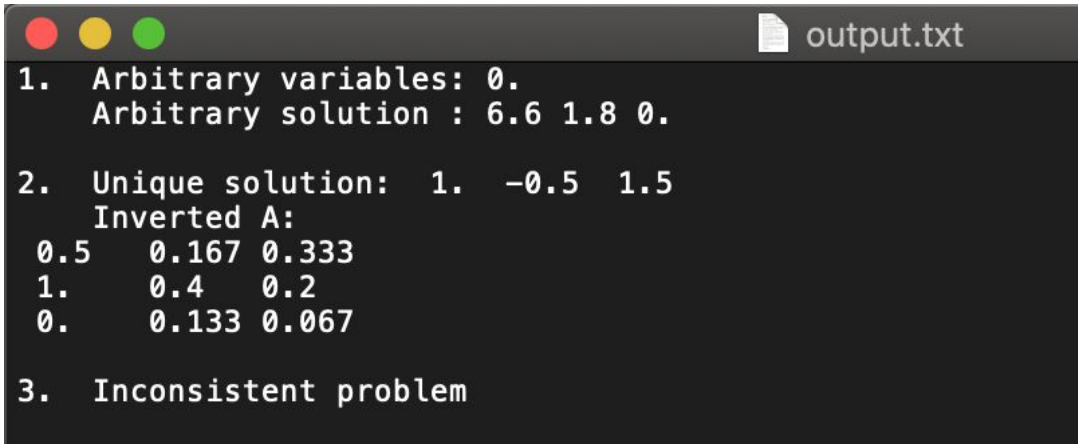
Note: Please include text files into your program by using commands like "open" instead of giving numbers into the program. Also, please avoid using console to run your program. It is better if you use some IDE (Integrated Development Environment) while writing your code. Please run all three instances in your source code instead of changing the file name and running üthe program for each instance (i.e. write a function for operations and call it for each instances in main). Do not use any linear algebra libraries available!

First of all, my code consist of three part: gauss function, rank function, inverse of matrix function. Rank function is useful to detect what the problem will result in, i.e. inconsistent problem, unique solution and arbitrary solution. This function use Gauss-Jordan as algorithm. And basically make:

i. **Interchanging two rows.**
ii. **Multiplying a row by a nonzero constant.**
iii. **Adding a multiple of a row to another row.**

In according to result of rank(A|b) and rank(A), decide output format. If output format is arbitrary solution, code call gauss function and this function first construct array x with size ENTRIES. Then, check diagonal matrix indices to control whether is 0 or not, as for that result, fill the matrix x. If is like that output format is unique solution, then first take inverse of matrix A and multiply with b matrix, we get unique solution as result. Desired result is automatically generated in "output.txt".

RESULT:



ABOUT THE RESULT:

Used algorithm is useful since finding rank decrease run time by deciding output format at first. In first output, I choose arbitrary variables as 0 to ease getting arbitrary solution. In second output, I choose $A^{-1} * b$ method in order to apply what I learned in lesson. In third output, it is shown that deciding output format at first is crucial since by this statement, I get return without traversing rest code.