Homework 4-B Bonus

I solve this question by transforming the processes I do on the paper into code. I was given a pivot function, which takes in 2 parameters, the index of a constraint to be pivoted and the index of a row (equation) to act as a pivot equation. My goal is to find these 2 parameters by using code, apply the pivot function with them as parameters and iterate until the maximum state is reached.

First, I have to find the “z” function from the given A and determine the number of constraints in the matrix A. The z function is the first row of the matrix A and the number of constraints can be derived from the length of the list BV.

After that, I have to determine whether the z function can be maximized any further. I accomplish this by observing the coefficients in front of the constraints’ variables. If one or more than one of them is positive, it means that the z function can still be optimized. Then, I select one of the constraint variables that have a positive coefficient as a variable to be pivoted (I choose the maximum values between them, but this is not necessary.). From this, I obtain the first parameter for the pivot function (The index of the constraint to be pivoted)

My next goal is to find the index of a row to act as a pivot equation. This can be accomplished by finding the equation that has the strictest constraint value. The constraint value can be found by dividing bi and the coefficient of the targetted constraint (from the previous step). The strictest constraint value is a constraint value that is more than zero and has the least value among other constraint values. After I find the strictest constraint value, I will use the index of the row it belongs to as the 2nd parameter to feed in the pivot function.

I iterate these steps until the z function cannot be maximized any further. I found it challenging to transform my way of thinking into code, it took some time to debug around the index value (Lists start counting from 0, but I start counting from 1).