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**Assignment 3**

1) a) Corresponding Variable Names

(a) Step direction **∆xB** = Aj

(b) Length step **t** = leavingLim

(c) Solution **xB\*** =bhat

b) How is the matrix inversion operation performed?

Here in the given code matrix inversion is performed using an operation called **mldivide**.

**A\B** is the matrix division of A into B, which is roughly the same as **A-1\*B**

**X = A\B** is the solution to the equation **A\*X = B**

c) Variable equivalent in terms of **cN, cB, B, N and b**

(a) PII = cBT B-1

(b) Chat = cNT - cBT B-1N

(c) Objval = cBT B-1 b

2) a) pivotF.m calls the pivot.m function recursively until the variable isFinal or isUnbounded becomes true.

b) pivotT.m function handles the cycling case, only change is using bland’s rule to find the entering index.

3) a) dual.m function maps the initial primal dictionary inputs to dual dictionary inputs.

b) pivotF1.m function makes use of the dual.m function to solve problems where primal is infeasible but

dual is feasible.

c) pivotG.m function handles the general case.

4) a) Auxiliary.m function maps the initial dictionary to the dictionary associated with the auxiliary probem.

b) pivotF2.m function all the cases of an LP. **(Collaborated with Ranga and Narain for this prob alone)**

5) use the test.m code attached to test all the cases.

1 - LP with feasible initial dictionary

2- LP that cycles

3- LP with feasible initial dual dictionary

4- LP using Dual-Based Phase Algorithm

5- LP with infeasible initial dictionary (using auxiliary)