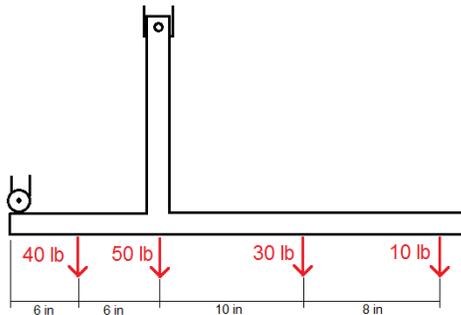Objective: Use Matlab to evaluate the forces acting on a t-shaped bracket.

Instructions: Considering the bracket shown in the diagram:

1. Where on the bracket will there be reactions with the supports? Identify these locations with a letter on the diagram above.
2. Using hand calculations, find the reactions at the supports in both the x- and the y- directions.
3. Next you will design a Matlab script to describe the forces acting on this bracket. After that we will use your program to answer some questions about the behavior of the bracket.
4. Assign variables for each of the forces (both reactions and applied forces) at the beginning of your program.
    a. Make sure to carefully document your code with comments.
    b. Pay careful attention to negative and positive forces.
    c. When you assign variables for the reactions, set them to zero for now.
5. Assign variables for each of the distances in the x-direction (you can choose either to use the distance between each force or the distance from a given point. Make sure to be consistent with your choice later when you are computing the sum of the moments).
6. Next, create equations for the sum of the forces in the x-direction, the sum of the forces in the y-direction, and the sum of the moments about the lefthand side of the bracket.
    a. Hint: leave the semicolon off of the end of your equations, that way the sum of each set of forces/moments will appear in the command window when you run your program.
7. Run your program. Is the bracket in equilibrium? How can you tell?
8. Change the values of the reactions at the supports to the values you found from your hand calculations. Run the program again. Is the bracket in equilibrium now?

9. Using your program, change one of the dimensions so that the truss is no longer in equilibrium. Play with the values of the other variables until it is back in equilibrium.
   a. What did you change?
   b. What other values had to be changed to place the bracket back into equilibrium.
10. Do steps 9a. and 9b for two other changes to the bracket. You may change either the geometry or an applied force.
11. If you were a designer responsible for designing a bracket like the one in the exercise, how would using an analysis tool like Matlab be helpful in your work?