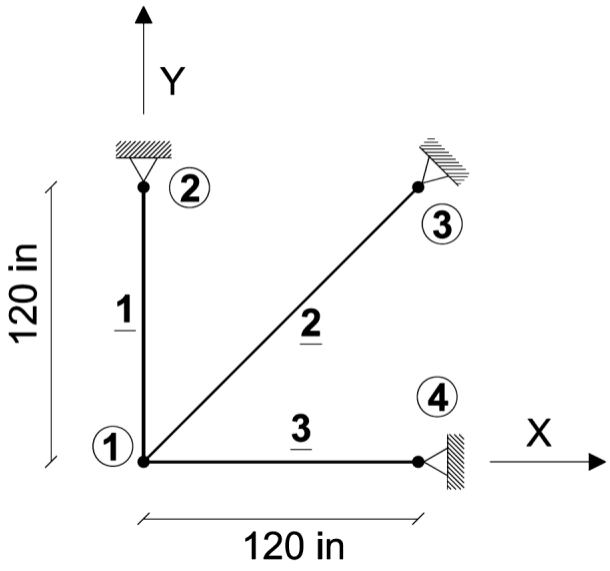
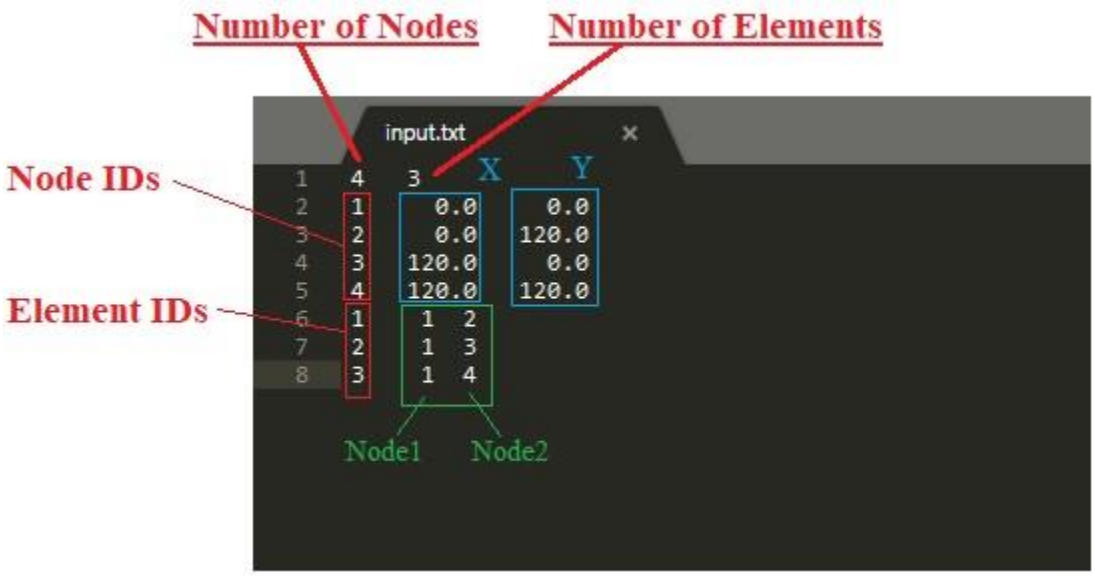
M1. MATLAB Assignment

In this question, you are going to develop a program to read a simple input file. This is a simple and important tutorial which lays the groundwork for the MATLAB project. Download the skeleton file **hw1.m** and **input.txt** before you begin.

The input file includes the geometric data required to define the following planar truss:



The following figure demonstrates the format of the input file:



To accomplish this assignment, you need to complete the following tasks to read the data from the input file and store them in specific variables to create a simple graphical representation:

- The name of the input file is stored in a variable named “inputFileName” in line 24. Open this file using MATLAB function “fopen” (line 27)

- Read data from the opened file (You may find MATLAB function “fscanf” useful for this part), and store them in the following variables:

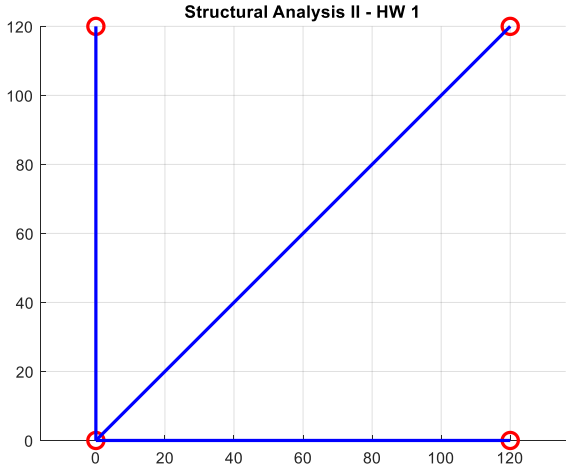
  `nNode`: Number of nodes
  `nElem`: Number of elements
  `coordinates`: An nNode-by-2 matrix including x and y coordinates, e.g. in this example:

```
coordinates =
           0     0
           0   120
         120     0
         120   120
```

  `elements`: An nElem-by-2 matrix including the element connectivity data in which the i-th row indicates the first and second nodes of the i-th element, e.g. in this example:

```
elements =
           1     2
           1     3
           1     4
```

If you do these simple tasks correctly, the rest of this m-file (hw1.m) provides a simple plot, which shows your code has read the data correctly:



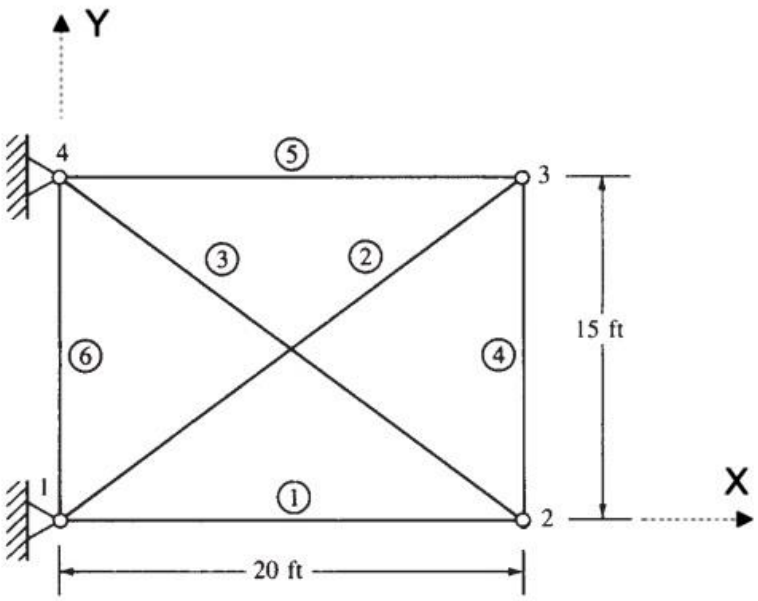
In this assignment, the input file only includes the geometric (nodal coordinates and element connectivity) data. In the next assignments, this input file will be completed to include boundary conditions and loading data.

Submission:

Upload your completed version of **hw1.m** to Canvas and **attach** a **hard copy** to your submission in class

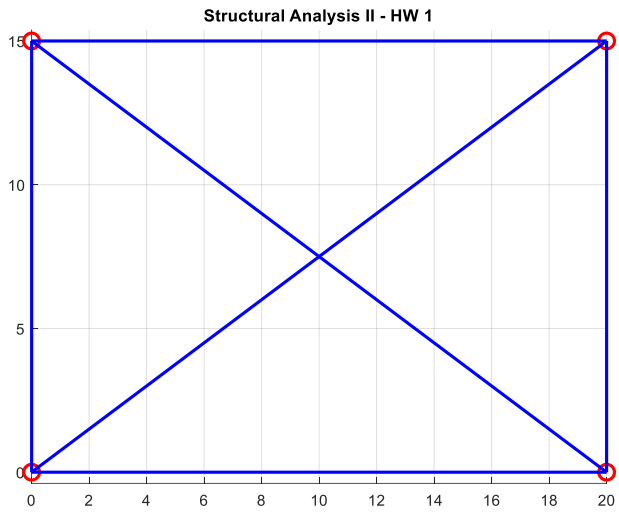
3. (MATLAB Assignment)

Consider the following truss:



Create a new input file **"truss.txt"** to define the geometry of this problem using the same format explained in the previous assignment.

Then, use your completed **hw1.m** script to read this input file (needless to say, you only need to modify line 24) and generate the following plot. Save this figure as **"truss.png"**



Submission:

Upload (i) the new input file **"truss.txt"** and (ii) the generated figure **"truss.png"** to Canvas and **attach** a **hard copy** to your submission in class