Plethora Technical Exercise

1. How to use the code: The code runs in the windows command window. When run it will prompt you to enter (or paste) the .json file to scan.
   Note: enter full path, including filename.

   After the cost has been printed to the screen, it will repeat the prompt asking for another file. To break the loop and exit the program, just press the "X" key.

2. There is no external code that needs to be loaded.

3. The programme should be improved in the following ways:
   a. Currently to calculate the material size (after adding the radius for CircularArcs), I use a bounding box in the world coordinate system. Ideally one would calculate a minimum bounding box for this using a Covariance Matrix, then solve for the eigenvalues and eigenvectors of a 3x3 symmetric matrix to determine the coordinate system and the minimum rectangular bounds.

   b. I could Serialize the file directly into memory using a DataContractJsonSerializer. However, my code would not pick up the edge ID, the rest was fine. As I'm limited in time due to work obligations, I chose not to research the issue, but to keep moving forward by converting the file to an XML format. I could then extract the data and load it into my classes. Therefore, that block of code could be made more efficient.

   c. I used the .Net PointF class when calculating a point on the Arc. This works fine, but there is a small loss in precision as I had to cast a double to a float. This type of cast should not be done in production code as a rule.