Exercise 01 – September 11, 2024

1. Create a Stem-and-Leaf Display

   Data set:
   62, 65, 68, 70, 73, 75, 75, 78, 81, 83, 84, 85, 87, 89, 92, 95, 96, 98, 100

   Solution:

   ```
   Stem | Leaf
   6    | 2 5 8
   7    | 0 3 5 5 8
   8    | 1 3 4 5 7 9
   9    | 2 5 6 8
   10   | 0
   ```

2. Construct a Box Plot
   Given the following dataset of students' test scores:

   Dataset:
   55, 60, 62, 63, 65, 66, 68, 70, 72, 75, 77, 78, 80, 85, 88

   Tasks:
   a. Determine the five-number summary (minimum, 25th Quartile, 50th Quartile, 75th Quartile, maximum).
   b. Draw the box plot based on the five-number summary with whiskers (use 1.5 * H-spread to identify outliers for step).
   c. Identify any potential outliers (outside value or/and far out value).

   Solution:

   a. Five-number summary:
      Minimum: 55

      The 25th percentile is the value between the 4th and 5th values, which is 63

      The 50th percentile: 70 (Middle value of the data set.)

      The 75th percentile is the value between the 11th and 12th values, which is 78

      Maximum: 88

   b. Box plot:

Whiskers are drawn from the **upper** (75th percentile) and **lower hinges** (25th percentile) (**78** and **63**) to the upper and lower adjacent values (24 and 14)
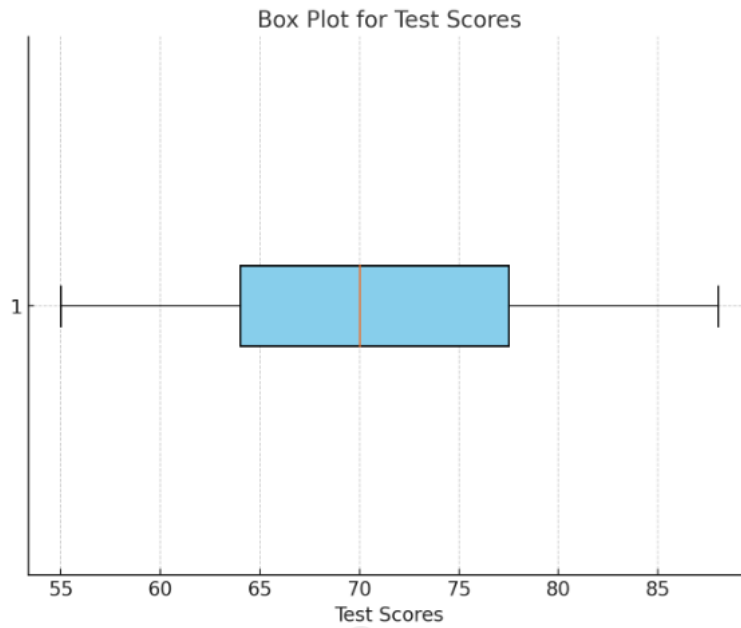
H-spread = Upper Hinge – Lower Hinge = 78 - 63 = **15**

Step = 1.5 * H-spread = 1.5 * 15 = **22.5**

Upper Inner Fence = Upper Hinge + 1 step = 77.5 + 22.5 = 100

Lower Inner Fence = Lower Hinge – 1 step = 64 – 22.5 = 41.5

Upper Adjacent = 88

Lower Adjacent = 55

Box Plot for Test Scores

c. Since all data points fall within the bounds (41.5 to 100), there are **no outliers** in this dataset.