機械所設計組 R12522615 王邑安 HW\_ID:2

**Introduction to statistical control and optimization**

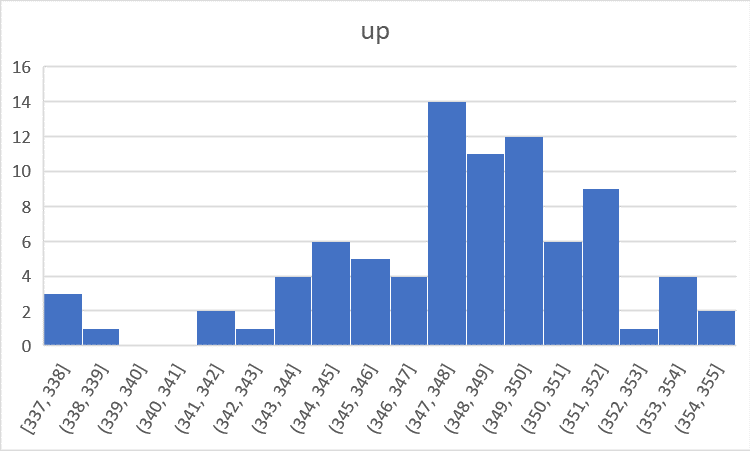
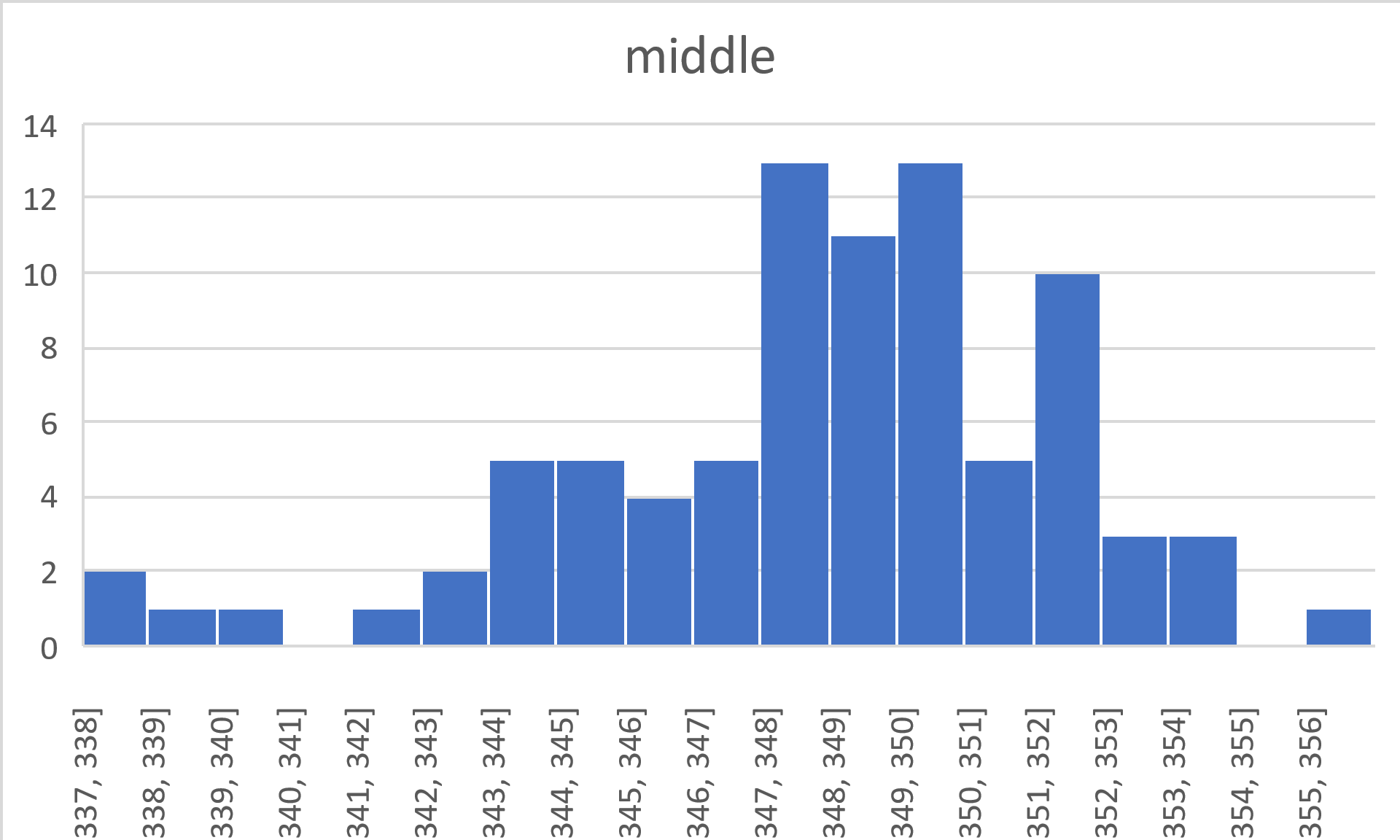
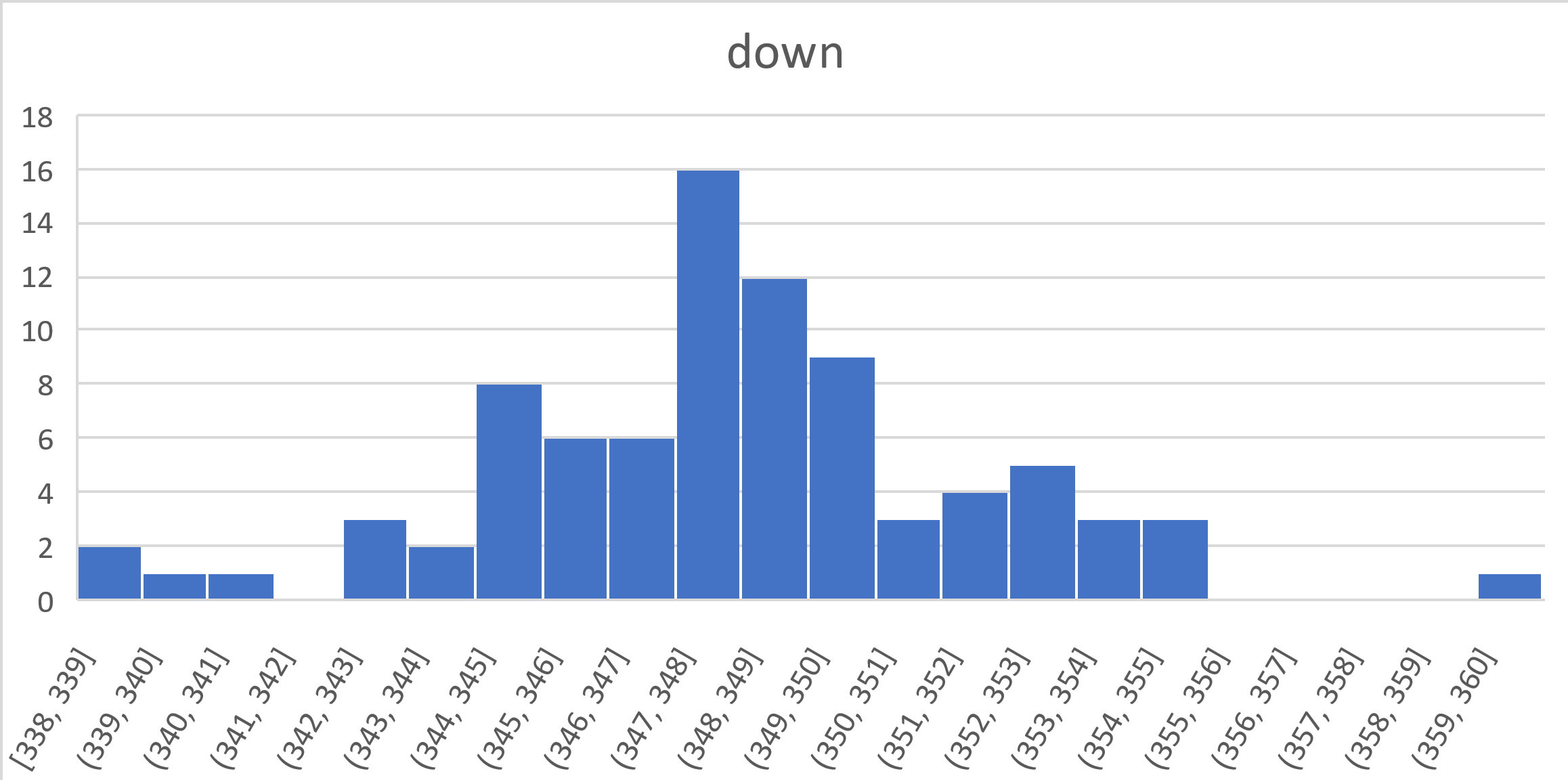
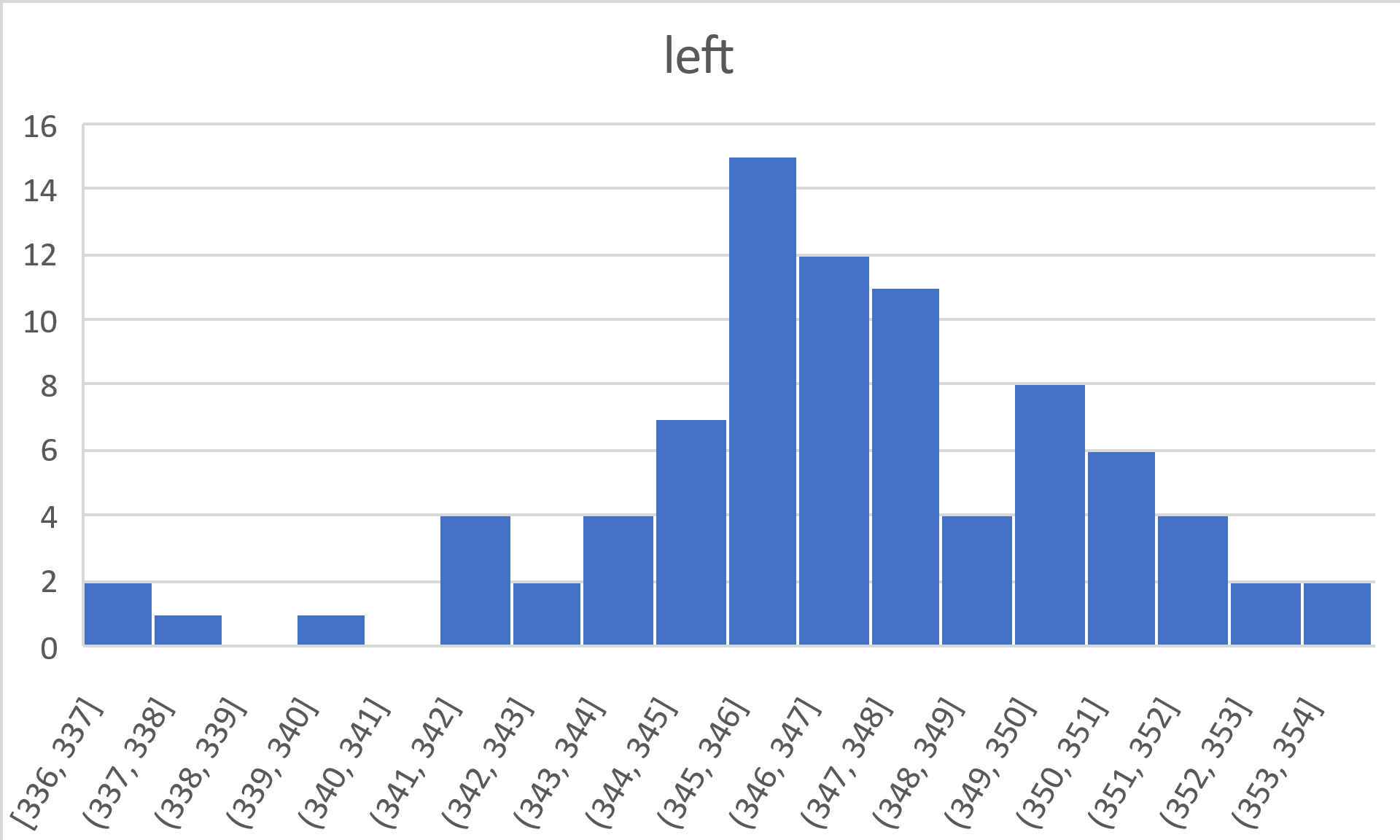
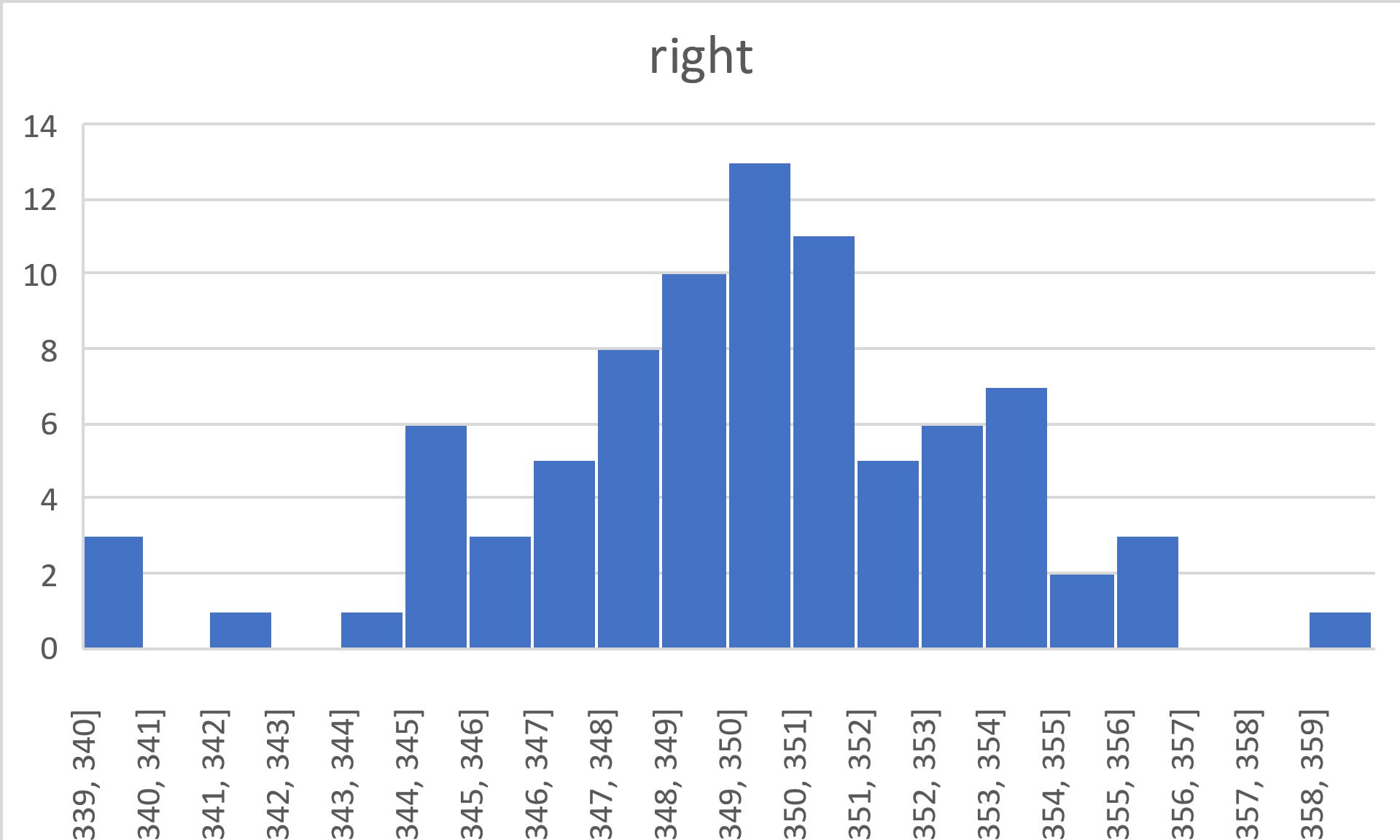
Homework 4





We arrange the location measures from smallest to biggest:

We can observe that the four measures of thickness on the right are consistently the largest, while those on the left are consistently the smallest. There is a clear trend of thickness increasing from left to right.

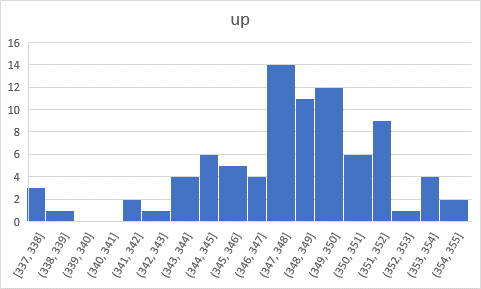
We plot the thickness dispersion by histogram of the 5 positions:

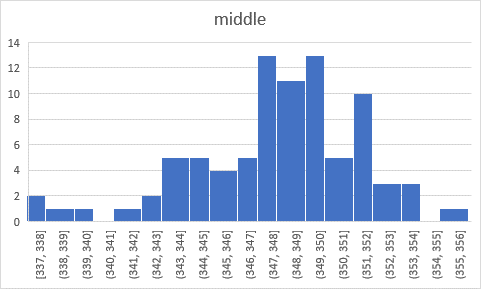
We can observe that the thickness values at the bottom exhibit the widest spread. Additionally, both the sample standard deviation and range of the thickness at the bottom are the largest. However, the interquartile range (IQR) remains nearly consistent across all measurements.

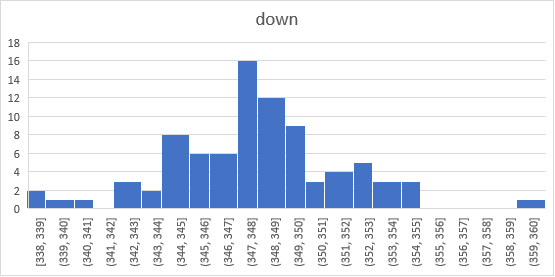


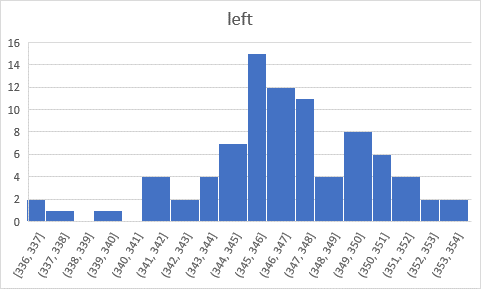


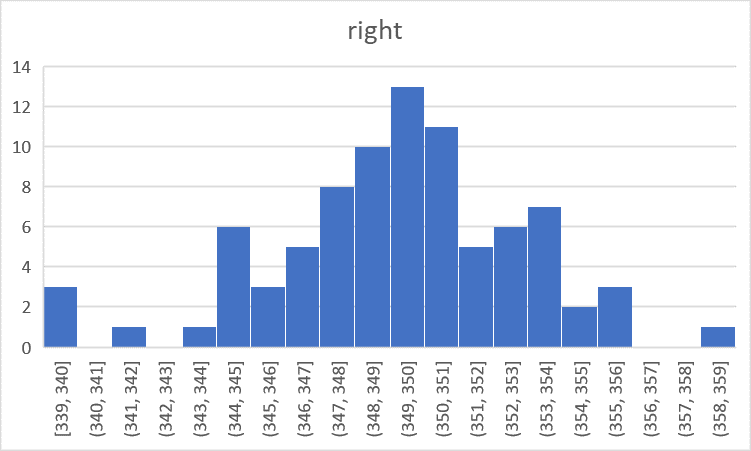




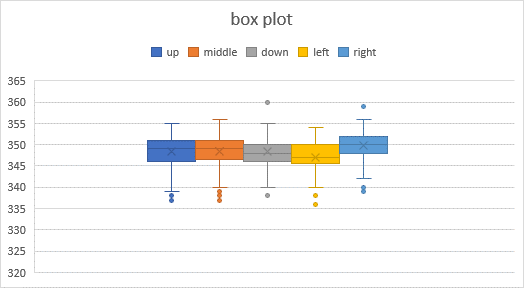














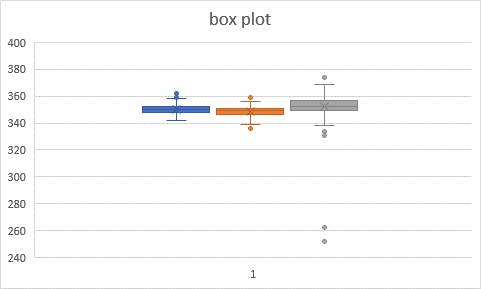


On the tested wafer, the thickness readings on the right side are slightly thicker than those on the left side, and the correlation coefficients for each side are high. Additionally, there is a slight difference in the dispersion of thickness readings among the 5 sides.

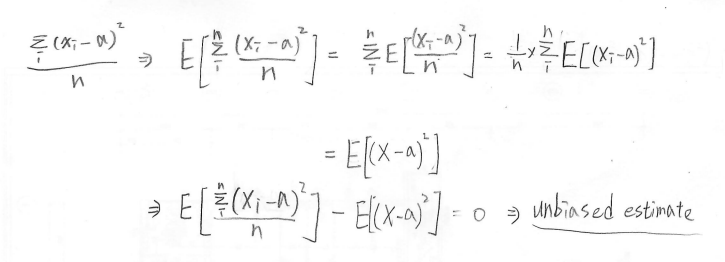






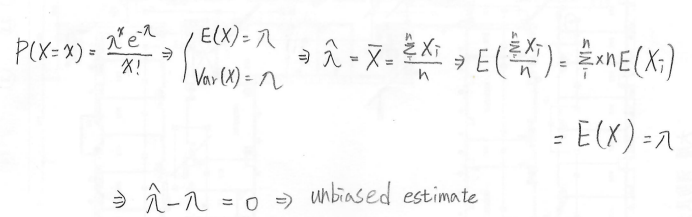




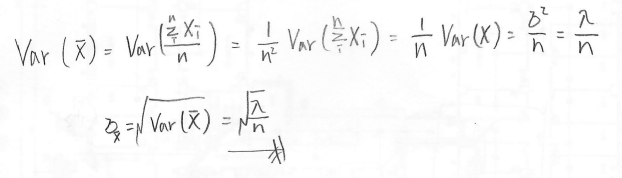




3-a.



3-b.



Since the mean value lambda remains unchanged by n, the denominator, square root n, is the sole factor influencing the standard error. As the sample size n approaches infinity, the standard error will decrease to its minimum.

3-c.



3-d.