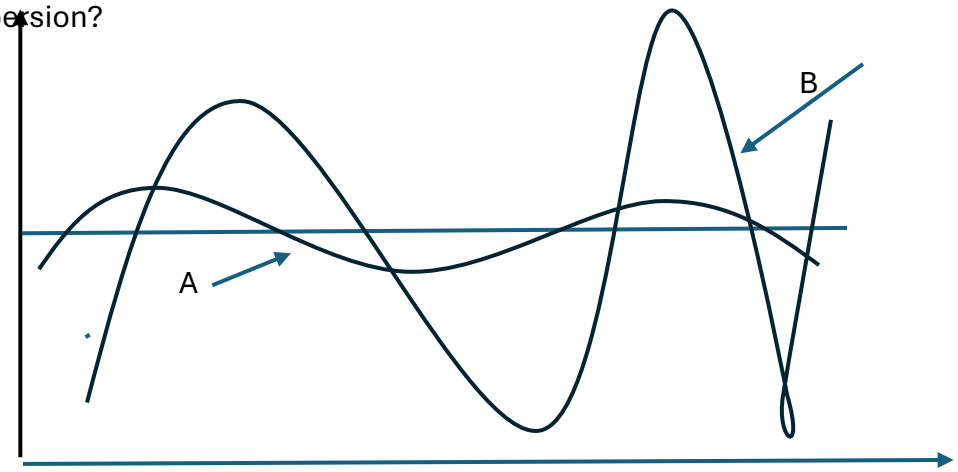
Chapter 4: measures of dispersions in frequency table

1) what is dispersion?



2) What are those measures

IQV (Index of Qualitative Variables), Variance (S^2), and standard deviation (st.d. or S)

$$S^2 = \frac{\sum(X_i - \bar{X})^2 \times F_i}{N-1} \qquad 0 \leq S^2 \leq +\infty$$

$$S = \sqrt{\frac{\sum(X_i - \bar{X})^2 \times F_i}{N-1}} \qquad 0 \leq S \leq +\infty$$

3) Example

Compute the variance and st.d. for the following sample,

age	frequency	Cumulative frequency
2	5	
15	64	
28	12	
31	37	
39	4	
47	58	
65	17	
N	197	

$$S^2 = \frac{\sum(X_i - \bar{X})^2 \times F_i}{N-1} = 280.1$$

$$S = \sqrt{\frac{\sum(X_i - \bar{X})^2 \times F_i}{N-1}} = \sqrt{280.1} = 16.7$$

$$\bar{X} = \frac{\sum X_i \times F_i}{N} = 32.7$$

$$S^2 = \frac{(2-32.7)^2 \times 5 + (15-32.7)^2 \times 64 + (28-32.7)^2 \times 12 + (31-32.7)^2 \times 37 + (39-32.7)^2 \times 4 + (47-32.7)^2 \times 58 + (65-32.7)^2 \times 17}{196}$$

4) exercise

Compute the variance and st.d. for the following sample,

age	frequency	Cumulative frequency
2	15	
15	4	
28	112	
31	37	
47	58	
65	117	
N		