Chapter 5: Z distribution (partial)

1) Application

GRE, LSAT, Height, Weight, salary raise , etc

Z score produces Z distribution (Percentile) that informs the relative score of the variable by comparing with its peers.

2) Computation of Z score

$$Z_i = \frac{X_i - \bar{X}}{S}$$

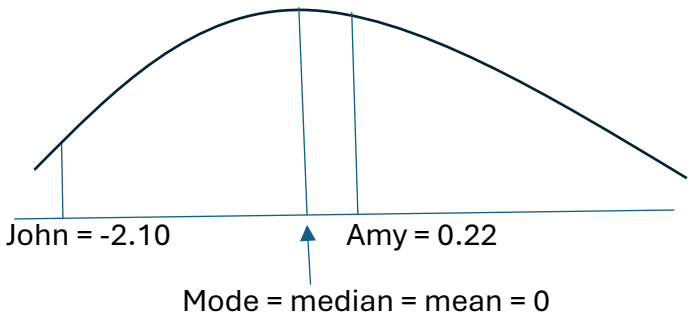
3) Examples

Student Amy score 76 in a test with mean of 72 and st.d. being 18, and student John score 87 in a test with mean of 95 and st.d. being 3.8. Who is doing relatively better in their respective classes?

$$Z_{Amy} = \frac{76 - 72}{18} = 0.22$$

$$Z_{John} = \frac{87 - 95}{3.8} = -2.10$$

4) Z distribution



Percentile for Amy is 58.71%, meaning she scored higher than 58.71% of her classmates

Percentile for John is 1.79%, meaning he scored higher than 1.79% of her classmates

5) Exercises

Student Lily scores 85 in a class with a mean of 91 and st.d. of 6.7, whereas student Eric scores 65 in a class with a mean of 61 and st.d. of 10. Who is doing relatively better in their respective classes? (hint: please calculate their respective Z scores and percentiles).

$$Z_{Lily} = \frac{85 - 91}{6.7} = -0.90; Percentile = 18.41\%$$

$$Z_{Eric} = \frac{65 - 61}{10} = 0.4; \quad Percentile = 65.54\%$$