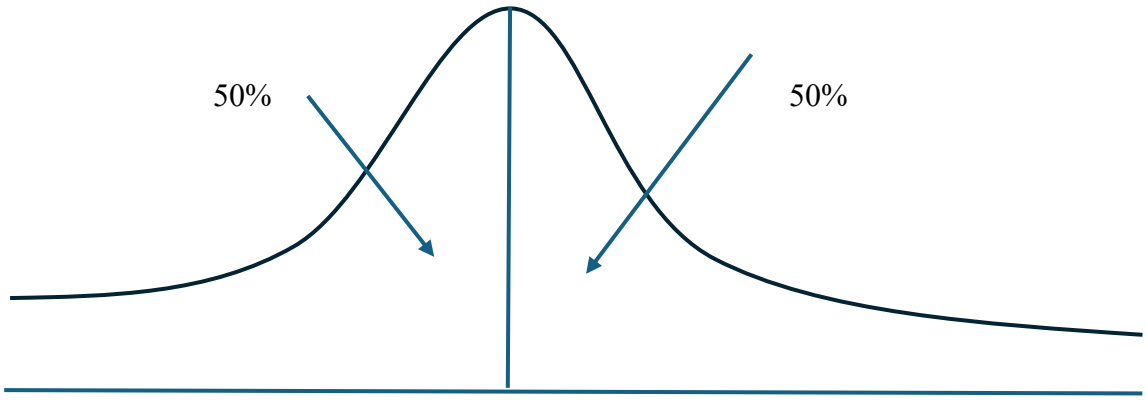
Chapter 5 Z score computation and distribution

1) What is the Z score and distribution



Mode = Median = Mean = 0

2) Computing of Z score

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

Z_i : *the Z score for case i*

X_i: *the raw score for case i*

$\bar{X}$: *mean for the sample*

S: *the st. d. of the sample*

3) Examples

Assuming John scored 87 in a class test with the average of 92, and st.d. is 5; Amy scored 78 in a class test with the average of 67 and st.d. of 8. Who is doing relatively better?

$$Z_{John} = \frac{X_{John} - \bar{X}}{S} = \frac{87 - 92}{5} = -1$$

$$Z_{Amy} = \frac{X_{Amy} - \bar{X}}{S} = \frac{78 - 67}{8} = 1.375$$

4) Percentile by looking at the Z distribution table

Percentile for John: 15.87%, meaning 15.87% of the students taking the same test with John scored lower than his.

Percentile for Amy: 96.12%, meaning 96.12% of the students taking the test scored lower than Amy's.

5) Exercises

X score	Mean	St.d.	Z score	Percentile
25	36	19	-.58	28.10%
57	48	10	.9	81.59%
62	64	5	-.4	34.46%
101	96	7	.71	76.11%

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