

## Chapter 5 Z score and distribution

### 1) Z score computation

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

### 2) Example

Sarah scores 76 out of a 100, in a class of average score 65 and st.d. 6, which is her Z score and distribution?

$$Z_{Sarah} = \frac{76 - 65}{6} = 1.83$$

Based on the Z distribution curve in the book, Sarah's percentile is 96.64%, meaning that her test score is higher than 96.64% of her classmates.

### 3) Example 2

Bryan score 87 in a class of an average of 95 and st.d. 15, what is his Z score, and distribution (percentile)

$$Z_{Bryan} = \frac{87 - 95}{15} = -0.53$$

Bryan's percentile is 29.81%, meaning that his test score is higher than 29.81% of her classmates.

#### 4) Exercise

Person A scores 68 in a class of average 65 and st.d 1.5. Person B scores 77 in a class of 86 and st.d. 12. Please compute their respective Z score and percentile, who is doing relatively better?

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

$$Z_A = \frac{68 - 65}{1.5} = 2, \quad Z_B = \frac{77 - 86}{12} = -0.75$$

A percentile is 97.73%

B percentile is 22.66%