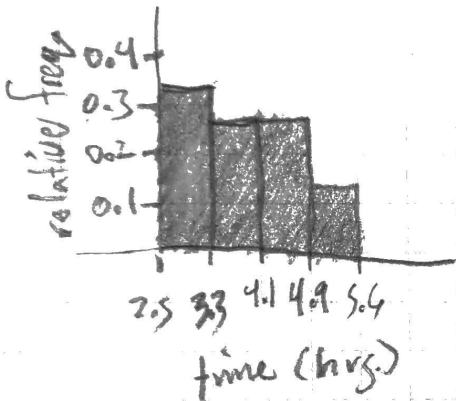


1. $q_{\max} = 5.6$ $q_{\min} = 2.5$

$$\text{min}^2 \quad 2.5$$

using: $(5.6 - 2.5)/4 \approx 0.8$ interval

Drying time (hrs)	Frequency	percentage
2.5 - 3.2	5	$5/15 = 33.3\%$
3.3 - 4.0	4	$4/15 = 26.6\%$
4.1 - 4.8	4	$4/15 = 26.6\%$
4.9 - 5.6	2	$2/15 = 13.3\%$



6. there are 15 datapoints for the sample

6. sorted: 2.5 2.8 2.8 2.9 3.1 3.3 3.4 3.6 3.7 4.2
4.4 4.8 4.8 5.2 5.6
median

median: 3.6

$$\text{mean: } \frac{\sum x}{n} = \frac{57.06}{15} = 3.804$$

$$d. \text{ var } \hat{\theta}^2 = \frac{\sum_{i=0}^n (x_i - \bar{x})^2}{n-1} = \frac{16.40395}{14} = 1.17171$$

$$\sigma = \sqrt{\sigma^2} = 1.042$$

2. a. mean : $\sum_{i=0}^n x_i / n$ Company A: 7.99
Company B: 10.28

median : Because there are 10 entries the median is
 $\text{sort}(\text{entries})[4] + \text{sort}(\text{entries})[5]$

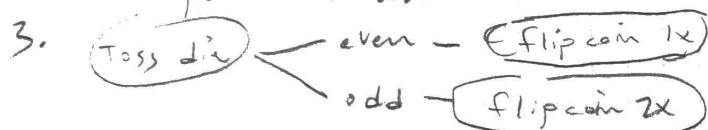
Company A : 8.4

Company B : 11.5

b. σ^2 : $\sum_{i=0}^n \frac{(x_i - \bar{x})^2}{n-1}$ Company A: 1.921
Company B: 2.262

$\sigma = \sqrt{\sigma^2}$: Company A: 1.386
Company B: 1.504

c. Based on these values, the data for company B varies more from the mean than company A. Therefore, company A delivers a more consistent product which would normally be desirable.



a. 1HH 1HT 1TH 1TT
2H 2T
3HH 3HT 3TH 3TT
4H 4T
5HH 5HT 5TH 5TT
6H 6T

b. $A = \{1HH, 1HT, 1TH, 1TT, 2H, 2T\}$
 $B = \{1TT, 3TT, 5TT\}$

c. $A' = \{3HH, 3HT, 3TH, 3TT, 4H, 4T, 5HH, 5HT, 5TH, 5TT, 6H, 6T\}$

d. $A \cap B = \{3TT, 5TT\}$

f. $A \cup B = \{1HH, 1HT, 1TH, 1TT, 2H, 2T, 3TT, 5TT\}$

4. $S = \{0, \dots, 10\}$ $A = \{0, 2, 4, 6, 8, 10\}$ $B = \{1, 3, 5, 7, 9\}$
 $C = \{2, 3, 4, 5\}$ $D = \{1, 4, 7, 8\}$

a. $A \cap B = \{3\} = \emptyset$

b. $B \cup C = \{1, 2, 3, 4, 5, 7, 9\}$

c. $(C \cap D) \cup B = D \cup B = \{1, 3, 4, 5, 7, 8, 9\}$

d. $(S \cap D)' = D' = \{0, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

e. $A \cap D = \emptyset$

5. $S = \{Cu, Na, K, N, U, O, Zn\}$ $A = \{Cu, Na, Zn\}$ $D = \{Na, K, N\}$ $C = \{O\}$

a. $A \cup C = \{Copper, Sodium, Zinc, Oxygen\}$

b. $(A \cap B') \cup C' = C' = \{Copper, Sodium, Nitrogen, Potassium, Uranium, Zinc\}$

c. $A \cap B \cap C = \emptyset$

d. $(A' \cup B') \cap (A' \cup C') = (A' \cup B') \cap S = (S - \{Sodium\}) = \{Copper, Nitrogen, Potassium, Uranium, Oxygen, Zinc\}$

6. $S = \{E_1, E_2, E_3, E_4, E_5\}$

a. $P(E_1) = P(E_2) = 0.15$ $P(E_3) = 0.4$ $P(E_4) = 2P(E_5)$

$0.15 \cdot 2 + 0.4 + x + 2x = 1$

$x = P(E_5)$

$3x = 0.3$

$x = 0.1$

$P(E_3) = 0.1$

$P(E_4) = 0.2$

b. $P(E_1) = 3P(E_2) = 0.3$

$0.3 + 0.1 + 3x = 1$

$x = \frac{0.6}{3} = 0.2$