

DV1597 Exercise 2

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1a) No, there is not enough information.

1b)

$$P(A \text{ and } B) = 0.3 \cdot 0.7 = 0.21$$

$$P(A \text{ or } B) = 1 - 0.21 = 0.79$$

$$P(A \mid B) = 0.3$$

2a)

i)

$$\mu = \frac{1}{9} \cdot (1 + 7 + 7 + 7 + 9 + 12 + 12 + 1 + 14) \approx 7.777$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (a_i - 7.777)^2}{8}} \approx 4.604$$

ii)

$$\mu = \frac{1}{9} \cdot (1 + 7 + 7 + 7 + 9 + 12 + 12 + 12 + 21) \approx 9.777$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (a_i - 9.777)^2}{8}} \approx 5.495$$

ii has greater mean and standard deviation.

2a)

i)

$$\mu = \frac{1}{8} \cdot (-10 + 17 + 27 + 40 + 40) = 14.25$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (a_i - 14.25)^2}{7}} \approx 19.616$$

ii)

$$\mu = \frac{1}{8} \cdot (-30 + 17 + 27 + 40 + 40) = 11.75$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (a_i - 11.75)^2}{7}} \approx 23.945$$

i has greater mean, and ii has greater standard deviation.

3)

In the figure below, the data is plotted as a histogram. The red line is a normal distribution with $\mu = -0.1159$ and $\sigma = 0.9747$. Visually, the histogram corresponds well to the normal curve, therefore it is reasonable to assume normality in the data.

