2.66

(a) $$\frac{2\% + 30\%}{5\% + 32\% + 6\% + 25\% + 2\% + 30\%} = \frac{32\%}{100\%} = 0.32 \#$$

A: 0.32

(b) $$\frac{32\% + 25\% + 30\%}{5\% + 32\% + 6\% + 25\% + 2\% + 30\%} = \frac{87\%}{100\%} = 0.87 \#$$

A: 0.87

(c) $$\frac{5\% + 6\% + 2\%}{5\% + 32\% + 6\% + 25\% + 2\% + 30\%} = \frac{13\%}{100\%} = 0.13 \#$$

A: 0.13

(d) $$\frac{6\% + 25\%}{5\% + 32\% + 6\% + 25\% + 2\% + 30\%} = \frac{31\%}{100\%} = 0.31$$

$$\frac{2\% + 30\%}{5\% + 32\% + 6\% + 25\% + 2\% + 3\%} = \frac{32\%}{100\%} = 0.32$$

$0.31 + 0.32 = 0.63 \#$ A: 0.63

2.82

Let A be the event that husband will vote on a bond referendum

Let B be the event that wife will vote on the referendum

(a) $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0.2 + 0.28 - 0.15 = 0.33 \#$

A: 0.33

(b) $P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{0.15}{0.2} = 0.75 \#$

A: 0.75

(c) $P(A|B') = \frac{P(A \cap B')}{P(B')} = \frac{P(A) - P(A \cap B)}{1 - P(B)} = \frac{0.05}{0.72} = 0.0694$ #

A: 0.0694

2.90

(a) $P(C|A \cap B) = \frac{P(A \cap B \cap C)}{P(A \cap B)} = 0.20$

$P(B|A) = \frac{P(A \cap B)}{P(A)}$

$P(A \cap B) = P(B|A)\,P(A) = 0.75 \times 0.3 = 0.225$

$P(A \cap B \cap C) = 0.2 \times P(A \cap B) = 0.2 \times 0.225 = 0.045$ #

A: 0.045

(b) $P(B' \cap C) = P(A \cap B' \cap C) + P(A' \cap B' \cap C)$

$= P(A)\,P(B'|A)\,P(C|A \cap B') + P(A')\,P(B'|A')\,P(C|A' \cap B')$

$= 0.3 \times (1 - 0.75) \times 0.8 + (1 - 0.3) \times (1 - 0.2) \times 0.9$

$= 0.3 \times 0.25 \times 0.8 + 0.7 \times 0.8 \times 0.9$

$= 0.06 + 0.504 = 0.564$ #

A: 0.564

(c)

$P(C) = P(A \cap B \cap C) + P(A' \cap B \cap C) + P(A \cap B' \cap C) + P(A' \cap B' \cap C)$

$= P(A \cap B \cap C) + P(A' \cap B \cap C) + P(B' \cap C)$

$= 0.045 + P(A' \cap B \cap C) + 0.564 = 0.609 + P(A' \cap B \cap C)$

$P(A' \cap B \cap C) = P(A')\,P(B|A')\,P(C|A' \cap B) = (1 - 0.3) \times 0.2 \times 0.15$

$= 0.021$

$P(C) = 0.609 + P(A' \cap B \cap C) = 0.609 + 0.021 = 0.63$ #

A: 0.63

(d)
$$P(A|B'\cap C)=\frac{P(A\cap B'\cap C)}{P(B'\cap C)}=\frac{P(A)\,P(B'|A)\,P(C|A\cap B')}{P(B'\cap C)}$$
$$=\frac{0.3\times(1-0.75)\times 0.8}{0.564}=0.106_{\#}$$

A: 0.106

2.100

Let H be the event that caused by human errors

$(2+4+5+7)+(1+3+4+7)+(1+2+2+5)=18+15+10=43$

$P(A)=\frac{18}{43}$ $P(B)=\frac{15}{43}$ $P(C)=\frac{10}{43}$

$$P(C|H)=\frac{P(C)P(H|C)}{P(C)P(H|C)+P(B)P(H|B)+P(A)P(H|A)}$$
$$=\frac{\frac{10}{43}\times\frac{5}{10}}{\frac{10}{43}\times\frac{5}{10}+\frac{15}{43}\times\frac{7}{15}+\frac{18}{43}\times\frac{7}{18}}=\frac{\frac{5}{43}}{\frac{19}{43}}=\frac{5}{19}=0.263_{\#}$$

A: 0.263

2.126

(a) $P(\text{union}\,|\,\text{new company (same field)})=\frac{P(\text{union}\cap\text{new company (same field)})}{P(\text{new company (same field)})}$

$$=\frac{\frac{13}{100}}{\frac{13}{100}+\frac{10}{100}}=\frac{\frac{13}{100}}{\frac{23}{100}}=\frac{13}{23}=0.565_{\#}$$

A: 0.565

(b) $P(\text{unemployed}\,|\,\text{union})=\frac{P(\text{unemployed}\cap\text{union})}{P(\text{union})}$

$$=\frac{\frac{2}{100}}{\frac{40}{100}+\frac{13}{100}+\frac{4}{100}+\frac{2}{100}}=\frac{\frac{2}{100}}{\frac{59}{100}}$$
$$=\frac{2}{59}=0.034_{\#}$$

A: 0.034

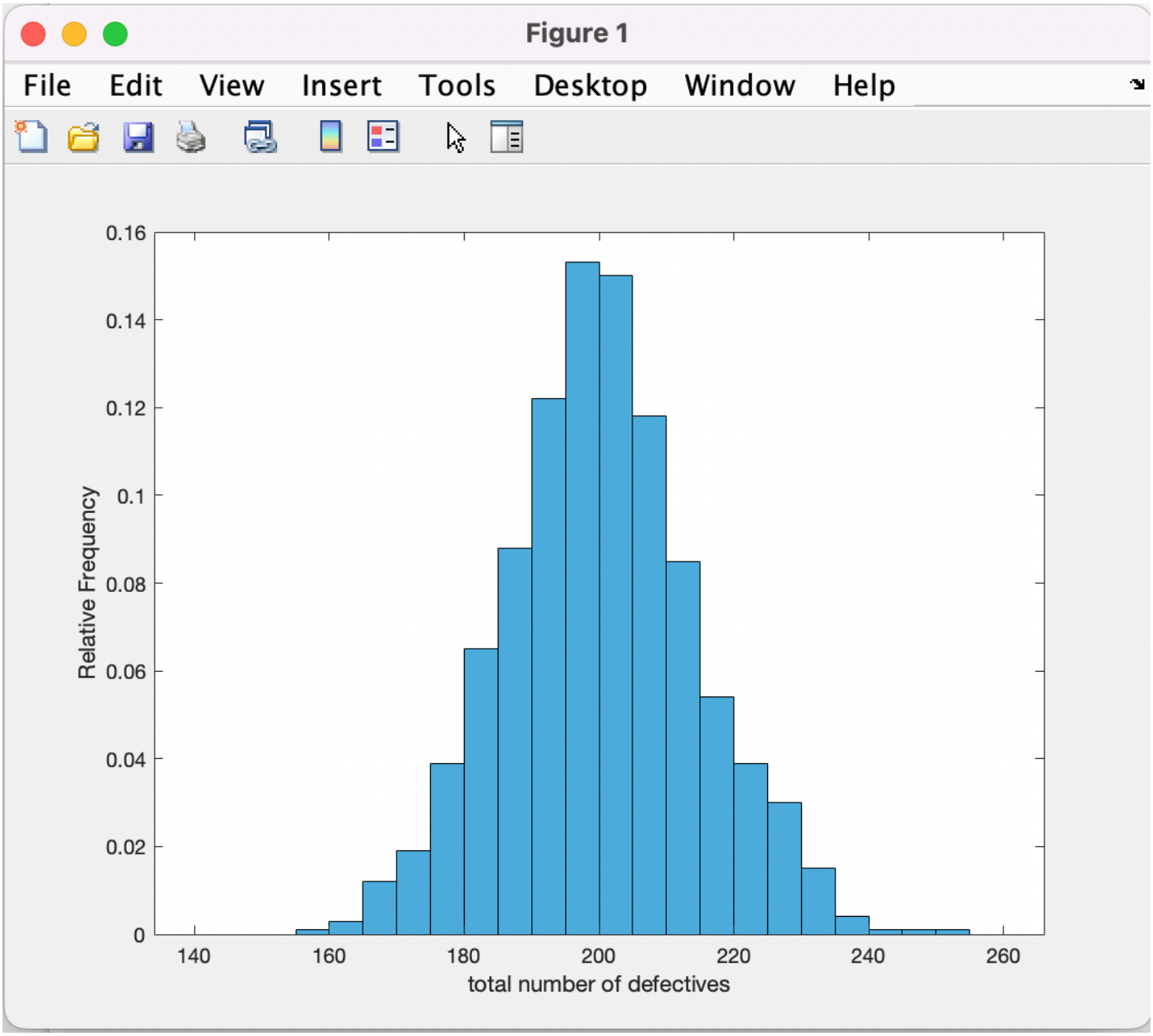
1.(a)

input defective rate = 0.7

input number of products to be manufactured = 10

1.(a) Output: [0 , 1 , 1 , 0 , 1 , 1 , 0 , 1 , 1 , 1]

1.(b)



1.(c)

在課本的 Example 2.42 中，所計算出的 theoretical value 是 10/49，換算成小數約為 0.2041，而我在 10 次的實驗中，分別得到了 0.2067 , 0.1967 , 0.2122 , 0.1978 , 0.2065 , 0.2080 , 0.1966 , 0.2156 , 0.2026 , 0.2086，實驗得到的值都很接近 theoretical value，雖然沒有剛好和 theoretical value 一樣，有時候會比 theoretical value 大一點點，有時候會比 theoretical value 小一點點，但都是在 theoretical value 附近的值，不會相差太遠。