第一次機率與統計作業

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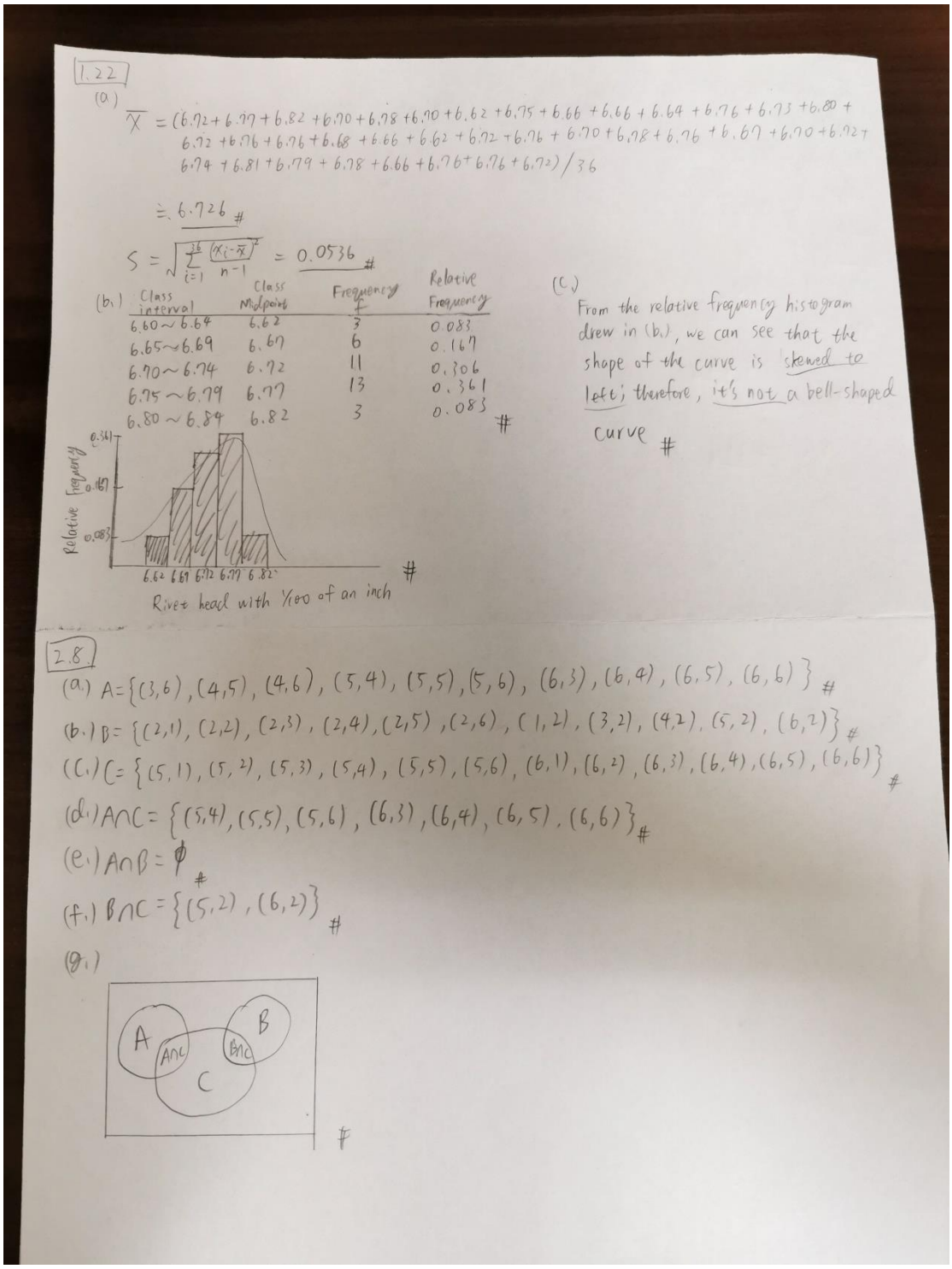
一、手寫作業：



1.22

(a.) $\bar{x} = (6.72+6.77+6.82+6.70+6.78+6.70+6.62+6.75+6.66+6.66+6.64+6.76+6.73+6.80+6.72+6.76+6.76+6.68+6.66+6.62+6.72+6.76+6.70+6.78+6.76+6.67+6.70+6.72+6.74+6.81+6.79+6.78+6.66+6.76+6.76+6.72)/36$

$\doteq 6.726$ #

$S = \sqrt{\frac{\sum_{i=1}^{36}(x_i-\bar{x})^2}{n-1}} = 0.0536$ #

(b.)

Class interval	Class Midpoint	Frequency f	Relative Frequency
6.60 ~ 6.64	6.62	3	0.083
6.65 ~ 6.69	6.67	6	0.167
6.70 ~ 6.74	6.72	11	0.306
6.75 ~ 6.79	6.77	13	0.361
6.80 ~ 6.84	6.82	3	0.083

#

#

(c.) From the relative frequency histogram drew in (b.), we can see that the shape of the curve is skewed to left; therefore, it's not a bell-shaped curve #

2.8

(a.) $A=\{(3,6),(4,5),(4,6),(5,4),(5,5),(5,6),(6,3),(6,4),(6,5),(6,6)\}$ #

(b.) $B=\{(2,1),(2,2),(2,3),(2,4),(2,5),(2,6),(1,2),(3,2),(4,2),(5,2),(6,2)\}$ #

(c.) $C=\{(5,1),(5,2),(5,3),(5,4),(5,5),(5,6),(6,1),(6,2),(6,3),(6,4),(6,5),(6,6)\}$ #

(d.) $A\cap C=\{(5,4),(5,5),(5,6),(6,3),(6,4),(6,5),(6,6)\}$ #

(e.) $A\cap B=\phi$ #

(f.) $B\cap C=\{(5,2),(6,2)\}$ #

(g.)

#

2.20

(a) $\neg M \cap \neg T \cap V$: region 6 #

(b) $M \cap V \cap \neg T$: region 2 #

(c.) $M \cup V \cap \neg T$: region 2, 5, 6 #

(d.) $\neg V$: region 4, 5, 7, 8 #

2.38

(a.) $6! = 720$ #

(b.) $3! \times (2!)^3 = 48$ #

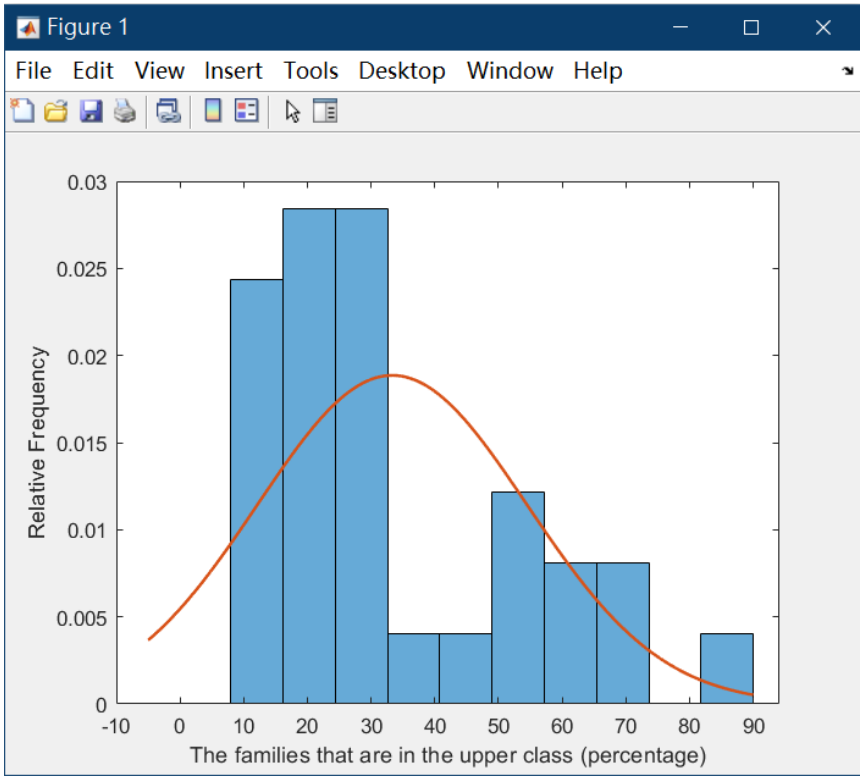
(c.) $3! \times 3! = 36$ #

二、matlab 部分：

1.25

(c.)：

The relative frequency histogram of the given data is plotted as the following graph.



(a.), (b.), (d.)：

The sample mean, sample median, and 10% trimmed mean of the given data is calculate as following result.

sampleMean	33.3100
sampleMedian	26.3500
trimmedmean	32.2000

The content which is required in (d.) is written in the following paragraphs.

由 matlab 的運算結果可知，題目給定的資料的平均值(sampleMean)比它經過 10%裁切後的平均值(trimmedmean)來的大。我個人認為其原因為題目給定的資料集中的最大數字過於極端而導致的，而這在(c.)中的 relative frequency histogram 可觀察到。

在 relative frequency histogram 中，可以清楚的看到：在從右邊數來第一和二的兩個 bar 之間空了一個 bar 的空間；相反的，在靠左邊的 bar 中，資料幾乎都比較密集，沒有明顯的最小極端出現。這表示了此資料集中，如我的推測，確實是有比大部份資料來的極端大的資料存在著。因此，基於以上的觀察，trimmedmean 會比 sampleMean 來的小確實是一件很合理的事。

1.30

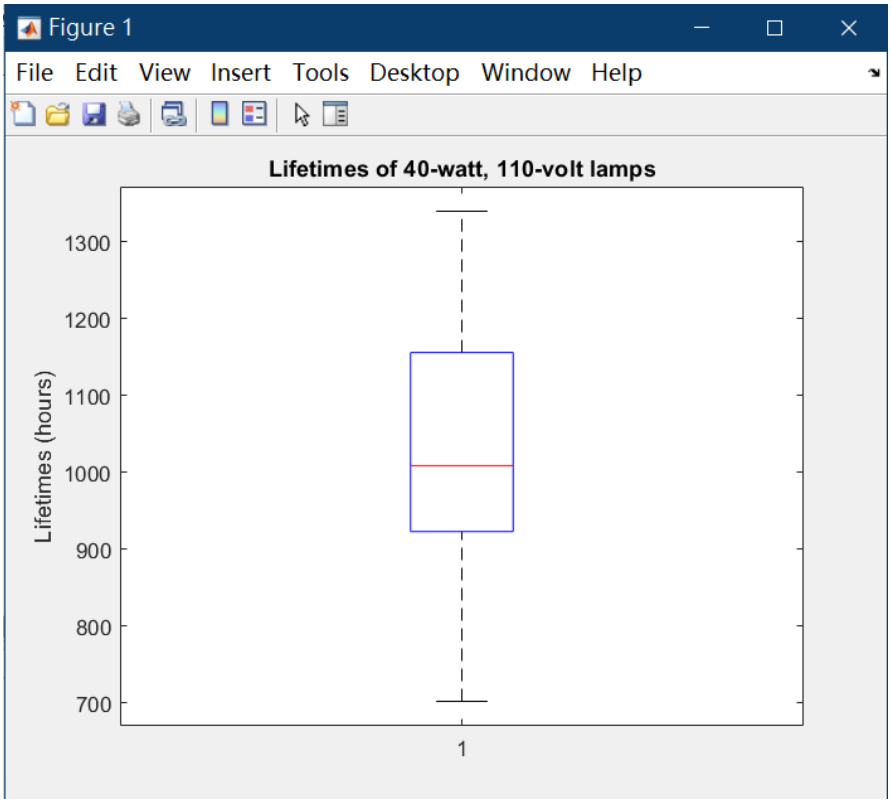


Figure 1
File Edit View Insert Tools Desktop Window Help
Lifetimes of 40-watt, 110-volt lamps
Lifetimes (hours)
1300
1200
1100
1000
900
800
700
1