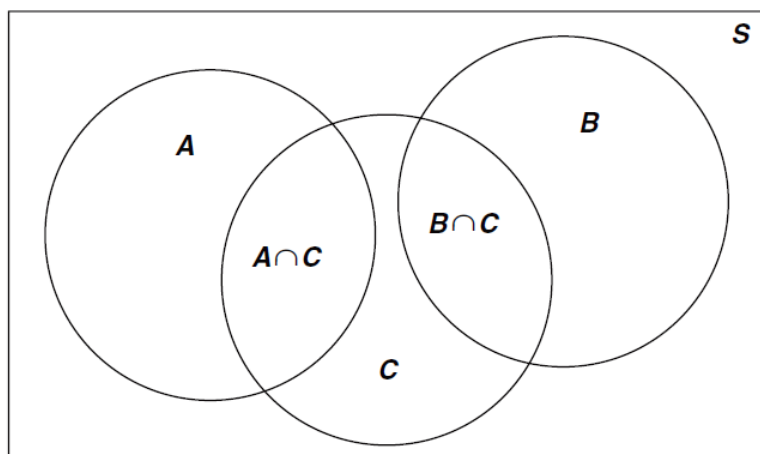


HW1 參考解答

Handwriting homework

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) $B = \{(1, 2), (2, 2), (3, 2), (4, 2), (5, 2), (6, 2), (2, 1), (2, 3), (2, 4), (2, 5), (2, 6)\}$.
- (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) A Venn diagram is shown next.



2.32

- (a) By Theorem 2.3, there are $6! = 720$ ways.
- (b) A certain 3 persons can follow each other in a line of 6 people in a specified order is 4 ways or in $(4)(3!) = 24$ ways with regard to order. The other 3 persons can then be placed in line in $3! = 6$ ways. By Theorem 2.1, there are total $(24)(6) = 144$ ways to line up 6 people with a certain 3 following each other.
- (c) Similar as in (b), the number of ways that a specified 2 persons can follow each other in a line of 6 people is $(5)(2!)(4!) = 240$ ways. Therefore, there are $720 - 240 = 480$ ways if a certain 2 persons refuse to follow each other.

2.66

- (a) $0.02 + 0.30 = 0.32 = 32\%$;
- (b) $0.32 + 0.25 + 0.30 = 0.87 = 87\%$;
- (c) $0.05 + 0.06 + 0.02 = 0.13 = 13\%$;
- (d) $1 - 0.05 - 0.32 = 0.63 = 63\%$.

2.70

- (a) $(\$4.50 - \$4.00) \times 50,000 = \$25,000$;
- (b) Since the probability of underfilling is 0.001, we would expect $50,000 \times 0.001 = 50$ boxes to be underfilled. So, instead of having $(\$4.50 - \$4.00) \times 50 = \$25$ profit for those 50 boxes, there are a loss of $\$4.00 \times 50 = \200 due to the cost. So, the loss in profit expected due to underfilling is $\$25 + \$200 = \$250$.

Matlab homework

```
HW1_code.m x +
1 - clear all
2 - close all
3
4 - d1=[6.72 6.77 6.82 6.70 6.78 6.70 6.62 6.75];%data in 1st row
5 - d2=[6.66 6.66 6.64 6.76 6.73 6.80 6.72 6.76];%data in 2nd row
6 - d3=[6.76 6.68 6.66 6.62 6.72 6.76 6.70 6.78];%data in 3rd row
7 - d4=[6.76 6.67 6.70 6.72 6.74 6.81 6.79 6.78];%data in 4th row
8 - d5=[6.66 6.76 6.76 6.72];%data in 5th row
9 - d=[d1 d2 d3 d4 d5];
10
11 %the first answer
12 - disp(['mean of sample: ', num2str(mean(d)), ' (*0.01 inch)']);
13 - disp(['standard deviation of sample: ', num2str(std(d)), ' (*0.01 inch)']);
14
15 %the second answer
16 - [n,xout] = hist(d,[6.6:0.05:6.8]); %use 5 bins for the histogram
17 - bar(xout,n/sum(n)); %relative frequency is n/sum(n)
18 - title('relative frequency histogram');
19 - xlabel('diameter in 1/100 of an inch')
20 - ylabel('relative frequency')
21
22 %the third answer
23 %it seems that the distribution is left-skewed
```