# Assignment 1 of CISC 1006

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## 1

| 1 | H | H |
|---|---|---|
|   | H | T |
|   | T | H |
|   | T | T |
| 2 | H |   |
|   | T |   |
| 3 | H | H |
|   | H | T |
|   | T | H |
|   | T | T |
| 4 | H |   |
|   | T |   |
| 5 | H | H |
|   | H | T |
|   | T | H |
|   | T | T |
| 6 | H |   |
|   | T |   |

### 1.1

$$A = \{1HH, 1HT, 1TH, 1TT, 2H, 2T\}$$

**1.2**

$$B = \{1HH, 1HT, 1TH, 1TT,$$
$$3HH, 3HT, 3TH, 3TT,$$
$$5HH, 5HT, 5TH, 5TT\}$$

**1.3**

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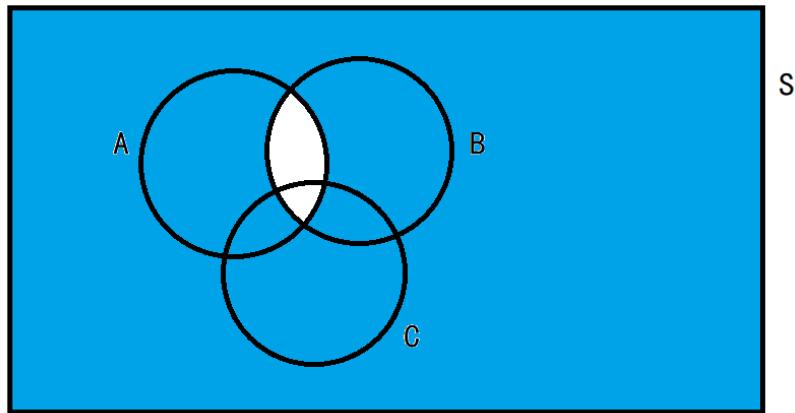$$5HH, 5HT, 5TH, 5TT\}$$

**1.4**

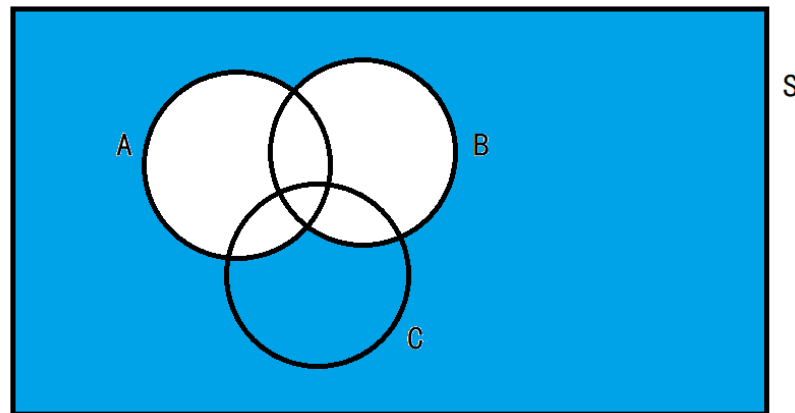$$A' \cap B = \{3HH, 3HT, 3TH, 3TT,$$
$$5HH, 5HT, 5TH, 5TT\}$$

**1.5**

$$A' \cup B = \{1HH, 1HT, 1TH, 1TT,$$
$$2H, 2T$$
$$3HH, 3HT, 3TH, 3TT,$$
$$5HH, 5HT, 5TH, 5TT\}$$
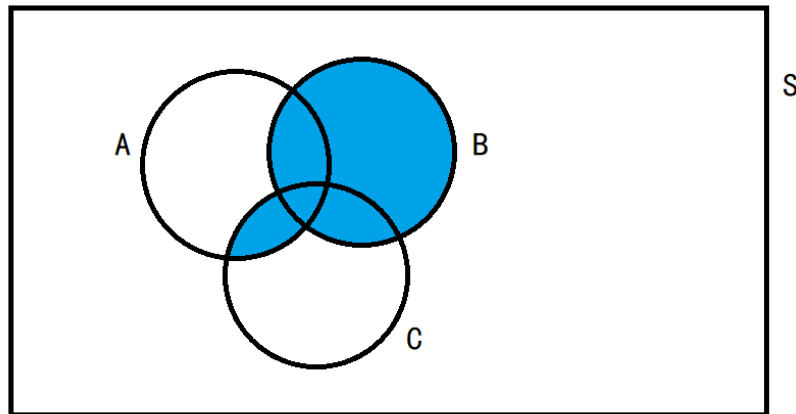
# 2

## 2.1



## 2.2

**2.3**



**3**

**3.1**

$$P_6^6 = 720$$

**3.2**

$$P_4^4 P_3^3 = 144$$

**3.3**

$$P_4^4 P_5^2 = 480$$

**3.4**

- $[1, 4, 4]$, $C_9^1 C_8^4 C_4^4 = 630$
- $[1, 3, 5]$, $C_9^1 C_8^3 C_5^5 = 504$
- $[2, 2, 5]$, $C_9^2 C_7^2 C_5^5 = 756$

- $[2, 3, 4]$, $C_9^2 C_7^3 C_4^4 = 1260$
- $[2, 4, 3]$, $C_9^2 C_7^4 C_3^3 = 1260$

$$Total = 4410$$

# 4

## 4.1

$$C_5^4 = 5$$

## 4.2

$$C_5^1 C_7^3 = 175$$

## 4.3

$$C_5^1 C_7^3 + C_5^2 C_7^2 + C_5^3 C_7^1 + C_5^4 C_7^0 = 460$$

## 4.4

$$C_5^0 C_7^4 + C_5^1 C_7^3 + C_5^2 C_7^2 = 420$$