

# ENEE 324 (1-29-2009)

Reading Assignment : 1.1 ~ 1.4  
 Homework : 1.22, 1.24, 1.34

by inkem

## 1.2.2

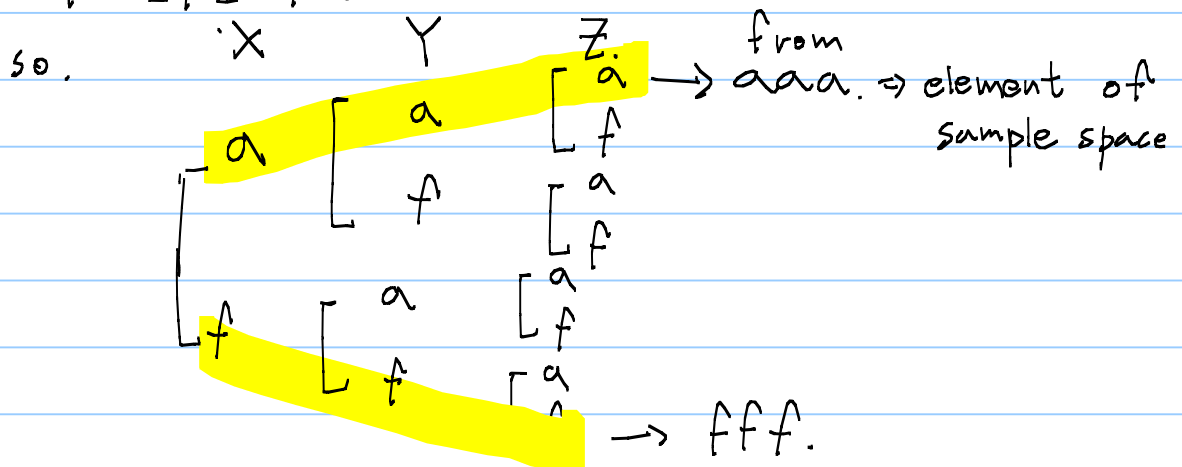
X, Y, Z : machines

a chip tested  $\begin{cases} (a) \text{ accepted} \\ (f) \text{ failed} \end{cases}$

(a) Sample space should contain all possible outcomes.

X - Y - Z

$\begin{bmatrix} a \\ f \end{bmatrix} \begin{bmatrix} a \\ f \end{bmatrix} \begin{bmatrix} a \\ f \end{bmatrix}$



$$S = \{ a a a, a a f, \dots, f f a, f f f \}$$

(b)  $Z_F = \{ \text{circuit from Z fails} \}$

$$= \{ a a f, a f f, f a f, f f f \}$$

$X_A = \{ \text{circuit from X is acceptable} \}$

$$= \{ a a a, a a f, a f a, a f f \}$$

(c) Mutually Exclusive means that there is no common outcome.  $\Rightarrow$  it means  $Z_F \cap X_A = \emptyset$

but,  $\{aaf, aff\}$  are  $Z_A \cap X_A$ .

$\Rightarrow$  They are not mutually exclusive.

(d) Collectively exhaustive means that the union of each set are sample space.

$Z_A \cup X_A \neq S$ . so, they are not collectively exhaustive

(e)  $C = \{ \text{more than one circuit acceptable} \}$   
 $= \{ aaf, afa, faa, aaa \}$

$D = \{ \text{at least two circuits fail} \}$   
 $= \{ ffa, faf, aff, fff \}$

(f)  $C \cap D = \emptyset \Rightarrow$  mutually exclusive

(g)  $C \cup D = S \Rightarrow$  collectively exhaustive.

1.2.4. Someone's birthday can be a day out of 365 days

$$S = \{ 01/01, 01/02, \dots, 12/31 \}.$$

$n(S) = 365$  → it means number of element in set S

$$B_{\text{July}} = \{ 07/01 \sim 07/31 \}.$$

$$n(B_{\text{July}}) = 31$$

1.3.4



$$S = \{ 1, 2, 3, 4, 5, 6 \}$$

①  $P_1 =$  Probability that the outcome is 1  $= \frac{1}{6}$

⇒ because the outcome can be fairly distributed from 1 to 6

$$P_1 = P_2 = P_3 = P_4 = P_5 = P_6 = \frac{1}{6}$$

(+) The probability can be determined after infinite trials.

$$\text{Prob } A \Rightarrow \lim_{k \rightarrow \infty} \frac{n(A)}{k} \leftarrow \begin{array}{l} \text{number of case which the outcome is A} \\ k \leftarrow \text{total trials} \end{array}$$

$$\textcircled{2} P_E = P_2 + P_4 + P_6 = \frac{3}{6} = \frac{1}{2}$$