

Assignment 3

①

X = number of heads.

$$P(X=x) = {}^n C_x (p)^x (q)^{n-x}$$

X	0	1	2	3
$P(X)$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$

$$S = \{ \overset{\text{НТН}}{\text{ННН}}, \overset{\text{НТН}}{\text{ННТ}}, \overset{\text{НТН}}{\text{НТН}}, \overset{\text{НТН}}{\text{НТТ}}, \overset{\text{НТН}}{\text{ТНН}}, \overset{\text{НТН}}{\text{ТНТ}}, \overset{\text{НТН}}{\text{ТТН}}, \overset{\text{НТН}}{\text{ТТТ}} \}$$

~~$$pdy \quad x = {}^n C_x (p)^x (q)^{n-x} \quad n=3$$~~

$$P = q = \frac{1}{2}$$

Q 4 = ~~length run~~ ^{head run} for at least 2

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X	0	1	2
$P(X)$	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{1}{8}$

→ { H H H }

pd $z =$

x	0	1	2	3
$P(x)$	$1/8$	$4/8$	$2/8$	$1/8$

2

Marginal distribution of X

$$= \left(\frac{11}{36} + \frac{9}{36} + \frac{7}{36} + \frac{9}{36} \right) \text{ at the bottom row}$$

Marginal distnks of Y

$$= \left(\frac{1}{36} + \frac{9}{36} + \frac{8}{36} + \frac{9}{36} \right) \text{ at right corner}$$

b

①' condition distribute of X give $Y=1 = (11/36)$

$$11 \quad \therefore Y \text{ given } X = 2 = 9/36$$

(c)

X	1	2	3	4	5	6
P(X)	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

$$E(X) = \sum x p(x) = 1 \times \frac{1}{6} + 2 \times \frac{1}{6} + 3 \times \frac{1}{6} + 4 \times \frac{1}{6} + 5 \times \frac{1}{6} + 6 \times \frac{1}{6}$$

$$= \frac{1}{6} + \frac{2}{6} + \frac{3}{6} + \frac{4}{6} + \frac{5}{6} + \frac{6}{6} = \boxed{3.5} \text{ Ans.}$$