

(1)

Probability Assignment

1. $P(\text{Sum of nos should be even} \cap \text{on of die shows 6}) = ?$

Possible events = $(2, 6), (4, 6), (6, 4), (6, 2)$

Total possible outcomes = 36

Required probab = $4/36 = 1/9$

2. $P(\text{Sum of nos less than 7}) = ?$

Possible events of sum of nos being 7 or greater than 7.

$(3, 4), (4, 3), (3, 5), (5, 3), (3, 6), (6, 3), (4, 5), (5, 4),$
 $(5, 6), (6, 5), (6, 6)$

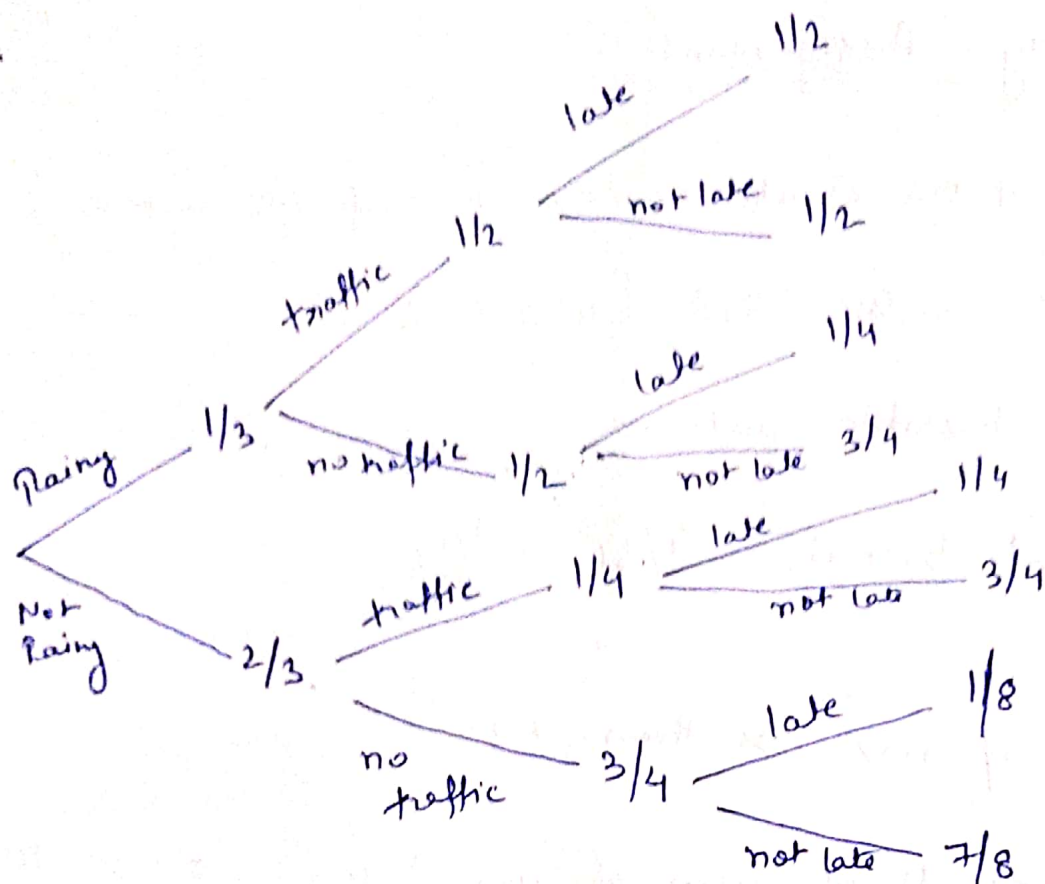
$P(\text{Sum of nos greater than equal to 7}) = 11/36$

$P(\text{Sum of nos less than 7}) = 1 - \frac{11}{36} = \frac{25}{36}$

B.

4.

(2)



$P(\text{not raining and heavy traffic and not late}) = ?$

$$= \frac{2}{3} \times \frac{1}{4} \times \frac{3}{4} = \frac{1}{8}$$

~~$P(\text{not raining and heavy traffic and not late}) = ?$~~

~~$$= \frac{2}{3} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{24}$$~~

$$P(\text{late}) = \frac{1}{12} + \frac{1}{24} + \frac{1}{24} + \frac{1}{16} = \frac{11}{48}$$

(3)

$$P(\text{rainy} | \text{late at work}) = ?$$

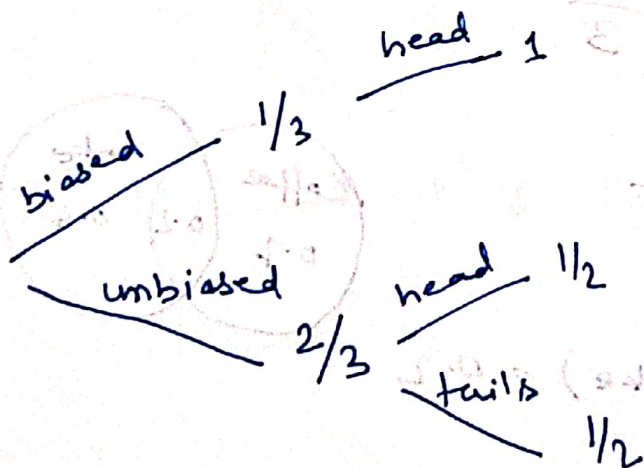
$$P(\text{rainy} | \text{late}) = \frac{P(\text{rainy and late})}{P(\text{late})}$$

$$P(\text{rainy and late}) = P(\text{rainy and traffic and late}) + P(\text{rainy and no traffic and late})$$

$$= \frac{1}{12} + \frac{1}{24} = \frac{1}{8}$$

$$P(\text{rainy} | \text{late}) = \frac{1/8}{11/48} = 6/11$$

5. 2 unbiased coin and 1 biased coin (gives only head)



(4)

R(a) Probab of head?

= Probab of head when coin is biased +
 " " " " " " unbiased

$$= \left(\frac{1}{3} \times 1\right) + \left(\frac{2}{3} \times \frac{1}{2}\right) = \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

(b) $P(\text{unbiased} | \text{head}) = ?$

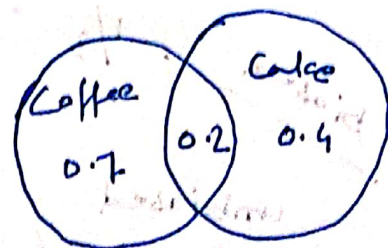
$$P(\text{unbiased} | \text{head}) = \frac{P(\text{unbiased and head})}{P(\text{head})}$$

$$= \frac{\frac{2}{3} \times \frac{1}{2}}{\frac{2}{3}} = \frac{1}{3} \times \frac{3}{2} = \frac{1}{2}$$

6. $P(\text{coffee}) = 0.7$

$P(\text{cake}) = 0.4$

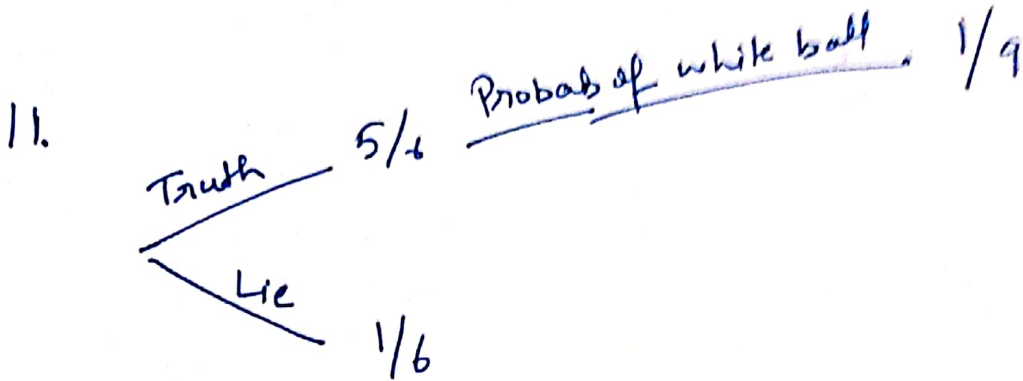
$P(\text{coffee and cake}) = 0.2$



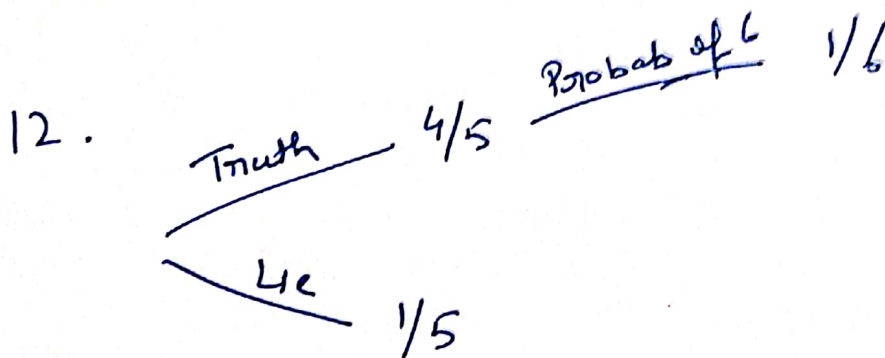
$$P(\text{coffee} | \text{cake}) = \frac{P(\text{coffee and cake})}{P(\text{cake})}$$

④

$$= \frac{0.2}{0.4} = \frac{1}{2}$$



Actual probab of white ball drawn = $\frac{5}{6} \times \frac{1}{9}$



Actual probab of 6 is $\frac{4}{5} \times \frac{1}{6}$

3. Fair coin is tossed 3 times

$$P(\text{at least 2 heads} | \text{at least 1 head}) = ?$$

$$P(\text{at least one head}) = 1 - \frac{1}{8} \quad (\text{when TTT is there})$$

$$P = \frac{7}{8}$$

Central Tendencies Assignment

①

1. (a) Mean of 9, 7, 11, 13, 2, 4, 5, 5

$$\text{Mean} = \frac{\text{Sum of all elements}}{\text{No. of elements}}$$

$$= \frac{56}{8} = 7$$

- (b) 2.2, 10.2, 14.7, 5.9, 4.9, 11.1, 10.5

$$\text{Mean} = \frac{59.5}{7} = 8.5$$

- (c) $1\frac{1}{4}$, $2\frac{1}{2}$, $5\frac{1}{2}$, $3\frac{1}{4}$, $2\frac{1}{2}$
 $5\frac{1}{4}$, $5\frac{1}{4}$, $11\frac{1}{2}$, $13\frac{1}{4}$, $5\frac{1}{2}$

$$\text{Mean} = \frac{22.11}{5} = 4.422$$

2. List = []

first = 0

second = 1

for i in range(10):

if i < 1:

next = x

else

next = first + second

first = second

second = next

list.append(next)

②

np.mean(list)

Output

8.8

3. First 5 prime nos are 2, 3, 5, 7, 11, ~~13~~

$$\text{Mean} = \frac{28}{5}$$

$$\text{Median} = 5$$

4. Mean of 8, 11, 6, 14, x , 13 = 66
 $x = ?$

$$\frac{8+11+6+14+x+13}{6} = 66$$

$$\Rightarrow 52 + x = 66 \times 6$$

$$\Rightarrow 52 + x = 396 \Rightarrow x = 344$$

5. 6, 8, $x+2$, 10, $2x-1$, 2 has mean 9 (3)

$$\Rightarrow \frac{6+8+x+2+10+2x-1+2}{6} = 9$$

$$\Rightarrow 3x+27 = 54 \rightarrow x = \frac{27}{3} = 9$$

Value of observation is

6, 8, 11, 10, 17, 2

$$6. (a) \text{ Mean} = \frac{(12 \times 5) + (10 \times 3) + (15 \times 2) + (14 \times 6) + (8 \times 4)}{20}$$

$$(b) \text{ Mean} = \frac{(25 \times 8) + \cancel{30 \times 10} (30 \times 12) + (15 \times 10) + (20 \times 6) + (24 \times 4)}{5}$$

7. (a) Mode = 8

(b) 17

(c) 3

(d) None

8. 17, x , 24, $x+7$, 35, 36, 46 has median 25

$$\text{So, } x+7=25, x=18$$

9. If nos in above case were not in ascending order, possible values of x could be 18 or 25

10. Mean can be used to find central tendency of data except in case 'd'

'Mode' can be used in case (d) to find common fav color of class.