

Probability Assignment

1) Die showing even (sum of numbers)

Die showing 6

$$P(\text{Die showing sum even \& one die showing 6}) = \frac{5}{36}$$

	1	2	3	4	5	6
1						A
2						
3						X
4						
5						
6		X	X			X

2) Sum of numbers < 7

$$P(\text{sum of numbers} < 7) = \frac{15}{36}$$

3) A = atleast one head = 7/8

B = two heads = 4/8

$$P(B|A) = (4/8) / (7/8) = 4/7$$

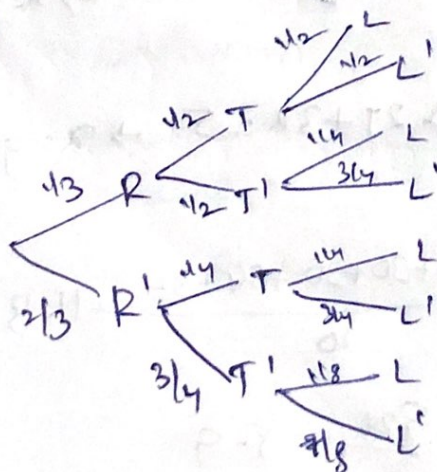
4) kid ← girl
boy

GG
GB
BG
BB

One is girl ⇒ possibilities = 3

Other is also a girl ⇒ $P(GG) = 1/3$

5)



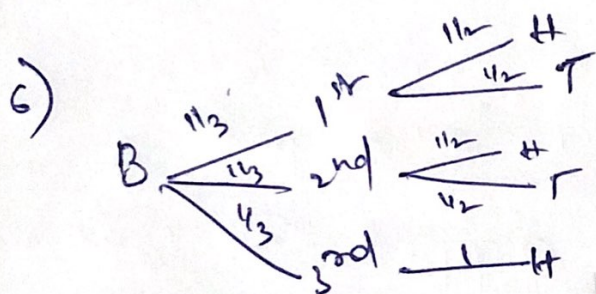
$$i) P(R \cap T \cap L) = \frac{2}{3} \cdot \frac{1}{4} \cdot \frac{3}{4} = \frac{1}{8}$$

$$ii) P(L) = P(RTL) + P(RTL') + P(R'TL) + P(R'T'L) \\ = \frac{1}{12} + \frac{1}{24} + \frac{1}{24} + \frac{1}{16} = \frac{11}{48}$$

$$\text{iii) } P(R|L) = \frac{P(R \cap L)}{P(L)}$$

$$P(R \cap L) = P(RTL) + P(RT'L) = \frac{1}{12} + \frac{1}{24} = \frac{1}{8}$$

$$P(R|L) = \frac{(1/8)}{(11/48)} = 6/11$$

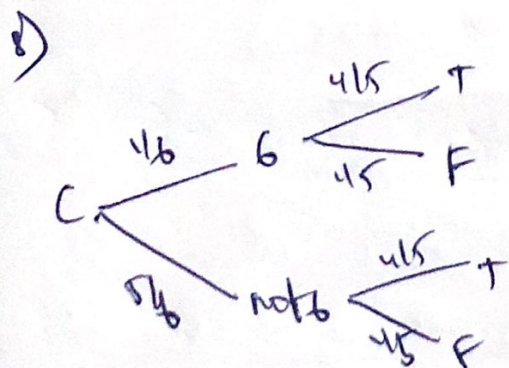


$$\text{i) } P(H) = \left(\frac{1}{3}\right)\left(\frac{1}{2}\right) + \left(\frac{1}{3}\right)\left(\frac{1}{2}\right) + 1\left(\frac{1}{3}\right) = \frac{2}{3}$$

$$\text{ii) } P(C_3|H) = \frac{P(H|C_3) P(C_3)}{P(H)} = \frac{1 \cdot \left(\frac{1}{3}\right)}{\frac{2}{3}} = \frac{1}{2}$$

$$\text{7) } P(CCF) = 70, P(CC) = 40, P(CCF \cap C) = 20$$

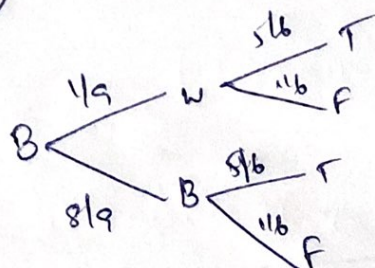
$$P(CF|C) = \frac{P(CCF \cap C)}{P(CC)} = \frac{20}{40} = \frac{1}{2}$$



$$P(\text{actually } G / \text{report } G) = \frac{P(G) P(T)}{P(G) P(T) + P(\text{not } G) P(T)}$$

$$= \frac{(1/6)(4/5)}{(1/6)(4/5) + (5/6)(4/5)} = \frac{4/30}{9/30} = 4/9$$

9)



$$P(\text{actual white} / \text{report white}) = \frac{P(W) P(T)}{P(W) P(T) + P(B) P(F)}$$

$$= \frac{(1/9)(5/6)}{(1/9)(5/6) + (8/9)(1/6)} = \frac{5/48}{13/48} = 5/13$$

10) $P(M \cap S) = 40/100$ $P(M) = 60/100$

$$P(S|M) = \frac{P(S \cap M)}{P(M)} = \frac{0.4}{0.6} = \frac{2}{3}$$

11)

Col	Good	Post Good	Total
Male	19	41	60
Female	12	28	40
Total	31	69	100

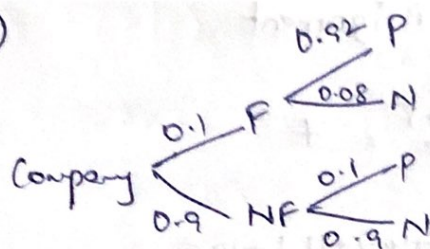
i) $P(M \cap G) = 19/100$ (Joint Probability)

ii) $P(M) = 60/100$

iii) $P(G) = 31/100$ (Marginal)

iv) $P(F \cap PG) = 28/100$ (Joint)

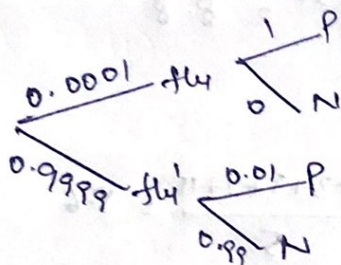
u)



$$P(\text{return F} / \text{truly F}) = \frac{P(F)P(P|F)}{P(F)P(P|F) + P(NF)P(P|NF)}$$

$$= \frac{(0.1)(0.92)}{(0.1)(0.92) + (0.9)(0.1)} = 0.505$$

u)



$$P(\text{flu} | P) = \frac{P(P|flu)P(flu)}{P(P)}$$

$$= \frac{1(0.0001)}{1(0.0001) + (0.01)(0.9999)}$$

$$= \frac{0.0001}{0.010099} \approx 0.01$$

Central Tendency Assignment

1) Mean :-
$$\frac{9+7+11+13+2+4+5+5}{8} = 7$$

$$\frac{2.2+10.2+14.7+5.9+4.9+11.1+10.5}{7} = 8.5$$

$$\frac{(11|4) + (2|12) + (51|2) + (31|4) + (21|2)}{5} = 3.66$$

2) fibonacci's Mean (for first 10 numbers)

$$\frac{0+1+1+2+4+8+13+21+34+55}{10} = 8.8$$

3) Prime numbers = 2, 3, 5, 7, 11

Median = 5

$$\text{Mean} = \frac{2+3+5+7+11}{5} = 5.6$$

4) Mean =
$$\frac{8+11+06+14+2+13}{6} = 8.6$$

$$\Rightarrow 52+x = 396$$

$$x = 344$$

5) Mean =
$$\frac{6+8+(x+2)+10+(2x-1)+2}{6} = 9$$

$$\Rightarrow 27+3x = 54$$

$$x = 9$$

6) i) Mean =
$$\frac{5(12) + 3(10) + 2(15) + 6(14) + 4(18)}{5+3+2+6+4} = 11.8$$

ii) Mean =
$$\frac{8(25) + 12(30) + 10(15) + 6(20) + 4(24)}{8+12+10+6+4} = 23.15$$

7) Modes of 12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8 = 8

15, 22, 17, 19, 22, 17, 29, 24, 17, 15 = 17

0, 3, 2, 1, 3, 5, 4, 3, 4, 2, 1, 2, 0 = 3

1, 7, 2, 4, 5, 9, 8, 3 \rightarrow no mode

8) Median of 17, x , 24, $x+7$, 35, 36, 46 is 25

$$\Rightarrow x+7=25 \Rightarrow x=18$$