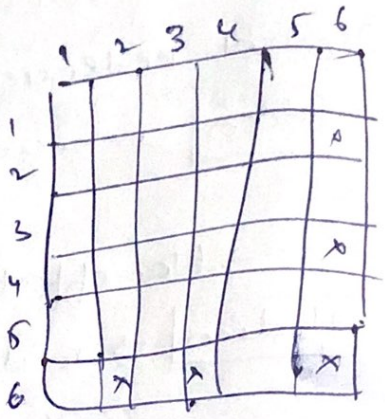
Probability Assignment



1) Die showing even (sum of numbers)
Die showing 6

P(Dice showing sum even & one die showing six) = $\frac{5}{36}$

2) Sum of numbers < 7

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

3) A = atleast one head = 7/8

B = two heads = 4/8

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

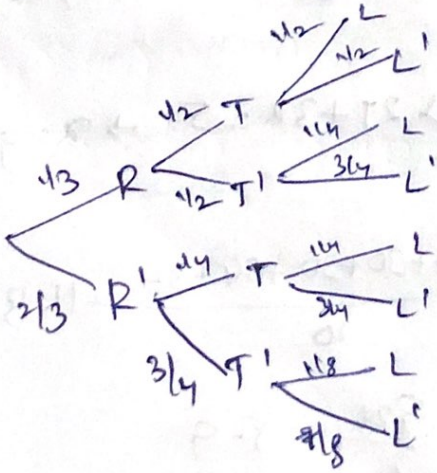
4) kids < girl, boy

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) $P(L) = P(RTL) + P(RT'L) + P(R'TL) + P(R'T'L)$

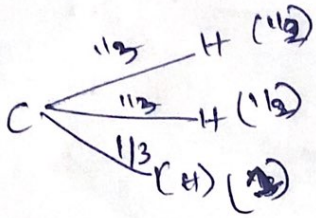
$= \frac{1}{12} + \frac{1}{24} + \frac{1}{24} + \frac{1}{16} = \frac{11}{48}$

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

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

$\Rightarrow P(R|L) = (1/8)/(11/48) = 6/11$

6)



i)

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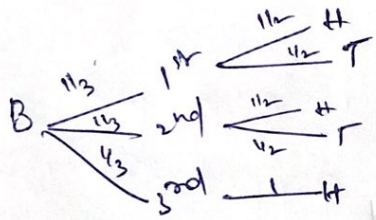
iii) $P(R|L) = \frac{P(R \cap L)}{P(L)}$

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

$P(R|L) = (1/8)/(11/48) = 6/11$

6)



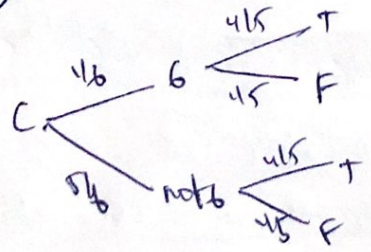
i) $P(H) = \left(\frac{1}{3}\right)\left(\frac{1}{2}\right) + \left(\frac{1}{3}\right)\left(\frac{1}{2}\right) + 1\left(\frac{1}{3}\right) = \frac{2}{3}$

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

7) $P(CF) = 70$, $P(C) = 40$, $P(CF \cap C) = 20$

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

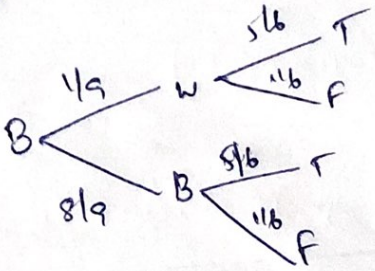
8)



$$P(\text{actual 6} / \text{report 6}) = \frac{P(6)\,P(T)}{P(6)P(T) + P(\text{not } 6)\,P(T')}$$

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

9)



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

$$= \frac{(1/9)(5/6)}{(1/9)(5/6) + (8/9)(4/6)} = \frac{5/48}{13/48} =$$

10) $P(M \cap S) = 40\%$ $\quad P(M) = 60\%$

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

11)

Col	Grad	Post Grad	Total
Male	19	41	60
female	12	28	40
Total	31	69	100

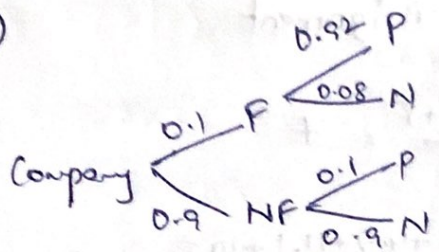
i) $P(M \cap G) = 19/60$ (Joint Probability)

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

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

iv) $P(F \cap PG) = 28/48$ (Joint)

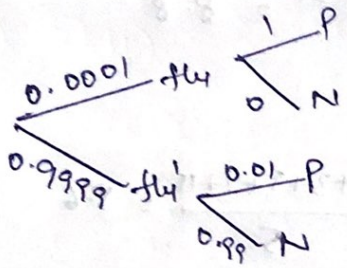
4)



$$P(\text{actually F} \mid \text{truly F}) = \frac{P(F)\,P(P|F)}{P(F)\,P(P|F) + P(NF)\,P(P|NF)}$$

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

5)



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

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

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

Central Tendencies Assignment

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

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

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

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

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

4) Mean = $\frac{8+11+06+14+x+13}{6} = 86$

$\Rightarrow 52+x = 396$

$x = 344$

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, 42, 1, 2, 0 = 3

1, 7, 2, 4, 5, 9, 8, 3 → no mode

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

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