DEEPALI NAGWADE

Assignment - 1

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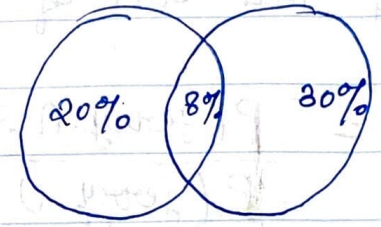

	Susan at Bank	Susan not at Bank
Jerry at Bank	8%	12%
Jerry not at Bank	22%	58%

(a) Susan was there last monday, what is the probability that Jerry was there too.

Sol^n $$P(\text{jerry} \mid \text{Susan}) = \frac{P(\text{Jerry} \cap \text{Susan})}{P(\text{Susan})}$$

$$= 8/30 = \boxed{26.66\%}$$

(b) Last friday, Susan wasn't at the bank. What is the probability that Jerry was there

Sol^n $$Pro(\text{Jerry} \mid \text{Susan}') = \frac{P(\text{Jerry} \cap \text{Susan}')}{P(\text{Susan}')} = \frac{12}{70} = \boxed{17.14\%}$$

c) last wednesday, at least one of them was at the bank what is the probability that both of them were there?

$$P(\text{jerry} \mid \text{susan}) = \frac{P(\text{jerry} \cap \text{susan})}{P(\text{jerry} \cup \text{susan})}$$

$$= 8/42 = 19.04\%$$

Homework 1.2

Given Hernald's chances of getting B = 80%
Sharon's chances of getting B = 90%
~~Both~~ atleast 1 = 91%

a) Probability of only Hernold getting B

$$\Rightarrow P(\text{only Harold}) = P(\text{Harold}) - P(\text{Harold} \cap \text{Sharon})$$
$$= 80 - 79$$
$$= \boxed{1\%}$$

b) Probability of only Sharon get a B

$$\Rightarrow P(\text{only Sharon}) = P(\text{Sharon}) - P(\text{Harold} \cap \text{Sharon})$$
$$= 90 - 79$$
$$= \boxed{11\%}$$

c) Probability that both ~~would~~ won't get a "B"

$$P(\text{Harold} \cap \text{Sharon}) = 100 - P(\text{Harold} \cup \text{Sharon})$$
$$= 100 - 91$$
$$= \boxed{9\%}$$

Homework 1.3

Are the events "Jerry at the bank" and "Susan is at the bank" independent?

Ans If the events were independent, then their visit to the bank have no effect on each other and Probability of both being there would be product of their individual probabilities $(20\% * 30\%) = 6\%$

∴ Both events are not independent

Homework 1.4

(a) Events "the sum is 6" and "second dice shows 5" independent

Ans $P(\text{second die} = 5 \cap \text{Sum} = 6) = P(\text{sum} = 6) * P(\text{Second die} = 5)$

$$\frac{5}{36} * \frac{6}{36} = \frac{1}{36} \quad (\text{which is not equal})$$

∴ Both events are not independent

(b.) Are events "the sum is 7' and "first die shows 5" independent

Ans $P(\text{first die} = 5 \text{ \& sum} = 7) = P(\text{sum} = 7) * P(\text{first} = 5)$

$$\frac{1}{36} = \frac{6}{36} * \frac{6}{36}$$

∴ As both the events are equal, events are independent.

Homeworks 1.5

(a) Given
$P(\text{funding oil}) = \text{TX} = 30\% \mid \text{AK} = 20\% \mid \text{NJ} = 10\%$

TX − 60% NJ = 10%

(a) Probability of funding oil = ?

Sol^n Prob. of funding oil in a state & Prob of choosing that state.

for TX : $P(\text{Oil} \mid \text{TX}) * P(\text{TX}) = 30\% * 60\% = 18\%$

for AK : $P(\text{Oil} \mid \text{AK}) * P(\text{AK}) = 20\% * 30\% = 6\%$

for NJ : $P(\text{Oil} \mid \text{NJ}) * P(\text{NJ}) = 10\% * 10\% = 1\%$

Ans Probability of finding oil = 18% + 6% + 1% = 25%

(b) Probability that they drill in TX

Ans $$P(TX|oil) = \frac{P(TX * Oil)}{P(Oil)} = \frac{18}{25} = 72\%$$

HW 1.6 Titanic survivor data

a) Prob that passenger didn't survive

Sol $$P(NS) = \frac{1490}{2201} = 0.6769$$

b) Prob that passenger was staying in first class.

Sol^n $$P(FC) = \frac{203+122}{2201} = \frac{325}{2201} = 0.1476$$

c) Prob that pass survived who are first class.

Sol^n $$P(S) = P(S \& FC) = \frac{203}{711} = 0.2855$$

d) Are survival & staying in FC independent?

Sol^n PTO

if prob of staying in FC and survival are equal then they are independent as mutully exclusive to each other.

P(surving) = 100 − P(not surving)
= 100 − 67.69

P(Surviving) = 32.31% → 0.3231

P(staying in FC) * Prob of survival
0.1476 * 0.3231 = 0.4768

∴ Events are not independent

(e) Prob of surviving passenger (FC & child)

Ans P(S, FC, child) = 6/711 = 0.0084

(f) Prob of surviving pass & adult

Ans P(S, P, Adult) = 597/711 = 0.8396

(g) are age & FC independent?

Ans P(age of P sur) = 654/711 + 57/711 = 711/711 = 1
P(C) = 203/711 = 0.2855
P(age & FC) → 1 * 0.2855 = 0.2855
equal ∴ independent