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Course :- Computer Science

First Name :- Janki

Last Name :- Patel

CWID :- 10457365

Janki J Patel

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Assignment :- 1 CWID :- 10457365

* Homework 1.1

	Jerry		
	Go to bank	Not goto back	
	0.08	0.22	0.30
susan	0.12	0.58	0.70
	0.20	0.80	1

$P(\text{Jerry} \cap \text{susan}) = 8\%$

ⓐ $P(\text{Jerry} \mid \text{susan}) = \dfrac{P(\text{Jerry} \cap \text{susan})}{P(\text{susan})} = 8/30$

$= 26.66\%$

ⓑ $P(\text{Jerry} \mid \text{susan}) = \dfrac{P(\text{Jerry} \cap \text{susan})}{P(\text{susan})} = \cancel{12}^{6} / \cancel{70}_{35}$

$= 0.1714\%$

ⓒ $P(\text{Jerry} \cap \text{susan} \mid \text{Jerry} \cup \text{susan}) =$

$= \dfrac{P(P(J \cap S) \cap (\text{Jerry} \cup \text{susan}))}{P(\text{Jerry} \cup \text{susan})}$

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$$= \frac{P(\text{Jerry} \cap \text{Susan})}{P(\text{Jerry} \cup \text{Susan})}$$

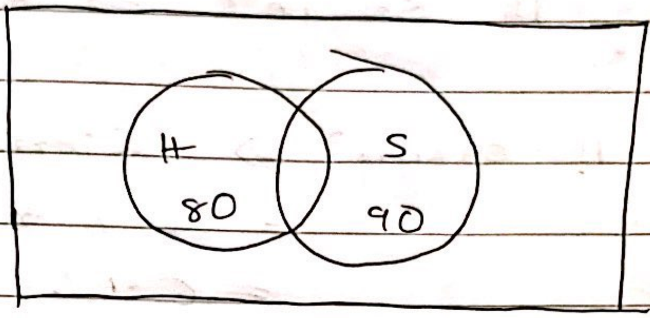
$$= 8/42 = 19.04\%$$

$$P(\text{Jerry} \cup \text{Susan}) = P(J) + P(S) - P(J \cap S)$$

$$= 20 + 30 - 8$$

$$= 42$$

⇒ Homework 1.2.



$P(H \cup S) = 91\%$

$P(H \cap S) = P(H) + P(S) - P(H \cup S)$

$= 80 + 90 - 91$

$= 79\%$

(a) $P(H - S) = P(H) - P(H \cap S)$

$= 80 - 79$

$= 1\%$

(b) $P(S - H) = P(S) - P(H \cap S)$

$= 90 - 79)$

$= 11\%$

(c) $P(H' \cup S') = 100 - P(H) - P(S) + P(H \cap S)$

$= 100 - 80 - 90 + 79$

$= 9\%$

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* Homework 1.3

$P(\text{Jerry} \cap \text{Susan}) \Rightarrow 8\%$

$P(\text{Jerry} \cap \text{Susan}) \Rightarrow P(\text{Jerry}) \times P(\text{Susan})$

$= 20\% \times 30\%$

$= 6\%$.

These events are independent, since both are not same.

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* Homework 1.4 :-

sum	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	~~7~~ 7	8	9	10	11
6	7	8	9	10	11	12

(a) $P(\text{sum is } 6) = 5/36$

$P(\text{second die shows } 5) = \cancel{6}^{1}/\cancel{36}_{6}$

$= 1/6$

$P(\text{sum is } 6 \cap \text{second die shows } 5)$

$= P(\text{sum is } 6) \times P(\text{second die show } 5)$

$= 5/36 \times 1/6 \quad \boxed{= 5/216}$

$\therefore P(\text{sum is } 6 \cap \text{second die shows } 5)$

$= 1/36$

$\therefore$ Both are not equal, so events are dependent.

(b) $P(\text{sum is } 7) = 6/36 = 1/6$

$P(\text{first die shows } 5) = 6/36 = 1/6$

$P(\text{sum is } 7 \cap \text{first die show } 5)$

$= P(\text{sum is } 7) \times P(1^{st} \text{ die shows } 5)$

$= 1/6 \times 1/6$

$= 1/36$

$\therefore$ Both events are not equal show it is dependent.

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* Homework 1.5 :-

	Tx	Ak	NJ	
oil	18	6	1	25
Necoil	42	24	9	75
	60	30	10	100

$$P(\text{coil} \mid Tx) = \frac{P(\text{coil} \cap Tx)}{P(Tx)}$$

$P(\text{coil} \cap Tx) = P(\text{coil} \mid Tx) \times P(Tx)$

$= 30 \times 60$

$= 18\%$

$P(\text{coil} \cap NJ) = P(\text{coil} \mid NJ) \times P(NJ)$

$= 10 \times 10$

$= 1\%$

$P(\text{coil} \cap Ak) = P(\text{coil} \mid Ak) \times P(Ak)$

$= 20 \times 30$

$= 6\%$

(a) $P(\text{coil}) = 25\%$

(b) $P(Tx \mid \text{oil}) = \frac{P(Tx \cap \text{oil})}{P(\text{coil})} = 18/25 = 72\%$

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* Homework 1.6

(a) P(Passenger did not survive) = 1490/2201

= 0.677

(b) P(passenger stay in first class) = 325/2201

= 0.147

(c) P(Passenger in first class | passenger survived)

= 203/711 = 0.2855

(d) ∵ $P(FC \mid S) \neq P(FC)$

∴ (c) ≠ (b)

∴ These are dependent

(e) P(Passanger in first class and Passanger was died / Passanger survived)

= 6/711 = 0.8438

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P(Passanger is active) / P (passanger survived)

$= 654/711 = 91.98\%$

j) $P(A \cap FC|S) = 197/711$

$P(A) | P(S) = 654/711 \quad P(FC/S) = 203/711$

$P(A \cap FC|S) \neq P(A|S) \times P(FC|S)$

$197/711 \neq 654/711 \times 203/711$

$0.272707 \neq 0.262 \rightarrow$ dependent

$\Rightarrow$ Given that passanger survivied, active & first class are dependent on each other

$P(C \cap FC|S) = 6/711$

$P(C|S) = 57/711$, $P(FC)|P(S) = 203/711$

~~$P(C \cap FC)$~~

$P\left(\frac{C \cap FC}{S}\right) \neq P(C)|P(S) \times P(FC)|P(S)$

$6/711 \neq 57/711 \times 203/711$

$0.0084 \neq 0.0228 \rightarrow$ dependent

Hence, events are dependent