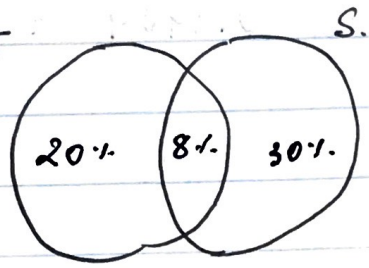
AAKASH RAMI

CS-513 Homework-1 CWID:- 10453138

1.

a)



	Susan at Bank	Susan not at Bank	
Jerry at Bank	8%	12%	20%
Jerry not at Bank	22%	58%	80%
	30%	70%	

a) $p(J/S) = \frac{p(J \cap S)}{p(S)}$

$= \frac{8}{30} = 0.266 = 26.67\%$

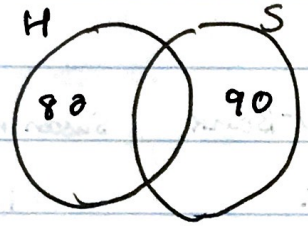
b) p(Jerry at Bank / Susan not there)

$p(J/S') = \frac{12}{70} = 0.1714 = 17.14\%$

c) $p(J \cap S) / p(J \cup S)$

$$= \frac{8}{20+30-8} = 0.1904 = 19.04\%$$

2.



$p(H) = 80\%$ $\quad p(H \cup S) = 91$

$p(S) = 90\%$

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

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

$= 80 + 90 - 91$

$p(H \cap S) = 79.$

a) $p(\text{only } H) = p(H) - p(H \cap S)$

$= 80 - 79$

$= \boxed{1\%}$

b) $p(\text{only } S) = p(S) - p(H \cap S)$

$= 90 - 79$

$= \boxed{11\%}$

c) Probability that both won't get B

$$p(H \cup B)' = 1 - p(H \cup B)$$

$$= 1 - \frac{91}{100} = 0.09 = \boxed{9\%}$$

3. For two events to be independent

~~p(a/b) = p(a)~~ $p(j/s) = p(j)$

$$p(j/s) = \frac{p(j \cap s)}{p(s)}$$

$$= \frac{8/100}{30/100} = \frac{8}{30} = \boxed{26.67\%}$$

Thus, $p(j/s) \neq p(j)$

So, event are not independent

4.

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

$p(\text{second die show } 5) = 6/36$

$= 1/6$

$p(\text{sum} = 6 \cap \text{second die show } 5) = \frac{1}{36}$

For event to be independent

$p(a \cap b) = p(a)\, p(b)$

$p(\text{sum} = 6) * p(\text{second die show } 5)$

$= \frac{5}{36} * \frac{1}{6}$

$= \frac{5}{216}$

$p(\text{Sum} = 6 \cap \text{second die show } 5) \neq p(\text{sum} = 6) * p(\text{second die show } 5)$

Thus, both events are not independent.

b)

$p(\text{sum} = 7) = \frac{6}{36} = \frac{1}{6}$

$p(\text{first die show } 5) = \frac{6}{36} = \frac{1}{6}$

$p(\text{sum} = 7 \cap \text{first dice shows } 5) = 1/36$

&

$p(\text{sum} = 7) * p(\text{first die } 5)$

$= 1/6 * 1/6$

$= 1/36$

Thus, both events are independent.

5. Chances of choosing

TX = 60%.

NJ = 10%.

AK = 100 − (60 + 10) = 30%.

Chances of finding oil

$TX = 60 \times \frac{30}{100} = 18\%$. $AK = 30 \times \frac{20}{100} = 6\%$.

$NJ = 10 \times \frac{10}{100} = 1\%$.

	Tx	AK	NJ	
Finding Oil	18%	6%	1%	25%
Oil not found	42%	24%	9%	75%
	60%	30%	10%	100%

a) P(finding oil) = 18% + 6% + 1%

= 25%

b) P(Drilled in Tx & oil found)

$= \frac{18\%}{25\%} = 72\%$

~~a) P(Not Survived) = 1490~~

~~B~~

Passengers Not survived = 1490

Total Passengers = 2201

a) P(Not survived) $= \frac{1490}{2201} = 0.6769$

$= 67.69\%$

6.

a) Passenger not survived

$$p(\text{Not survived}) = \frac{1490-673}{2201-885}$$

$$= 62.08\%$$

b) Passenger staying in first class.

$$p(\text{First class}) = \frac{325}{1316} = 24.69\%$$

c) Passenger survived & First class

$$p(S \cap f) = \frac{203}{499} = 40.68\%$$

d) For 2 event to be independent

$$p(a \cap b) = p(a)\, p(b)$$

$$p(S) = 100 - p(NS) \qquad p(f) = 24.69\%$$

$$= 100 - 62.08$$

$$= 37.92\%$$

$p(s) * p(f)$

$= 24.69 * 37.92$

$= 9.36\%$

~~$p(s)$~~

$p(s \cap f) = 40.68\%$

$p(s \cap f) \neq p(s)\, p(f)$

So, the events are not independent.

e) Passenger survived, first class & child

$p(\text{survived, first class \& child}) = \frac{6}{499}$

$= 1.2\%$

f) Passenger survived & Adult

$p(\text{survived \& adult}) = \frac{442}{499} = \underline{\underline{88.57\%}}$

g) Passenger survived, age & staying in First class independent

$$P(\text{age passenger survived}) = P(A/S) + P(C/S)$$
$$= \frac{442}{499} + \frac{51}{499}$$
$$= 1$$

$P(\text{survived \& first class}) = 40.68\%$.

Thus, $P(\text{age \& first class}) = 40.68\%$.

So, events are independent.