Week 2 - Data Science Assignment

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Abbreviations:

Peanut Butter - PB
Jelly - J

Probability of liking PB = P(PB) = 0.8
Probability of liking J = P(J) = 0.89
Probability of liking PB and J = P(PB and J) = 0.78

P(Liking J given that that the person likes PB) = P(J I PB)
= P(J and PB) / P(PB)
= 0.78 / 0.8
= 0.95

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a. P(Obese) = 0.2839
b. P(Obese I Has Health Coverage) = P(Obese and has health coverage) / P(has health coverage)
= 0.2503 / 0.8954 = 0.2795
c. P(Obese I Have health coverage ^{c}) = P(Obese and have health coverage ^{c}) / P(Health Coverage ^{c})
= 0.0336 / 0.1046 = 0.3212.
d. Being overweight is dependent on having heath coverage.
Reason - P(Overweight) = 0.3664 = 36.64 %
P(Overweight I Having health coverage) = P(O and H)/P(H) = 0.3306/0.8954 = 0.3692 = 36.92 %
As P(Overweight) is not same as P(overweight and having health coverage) , the events are dependent.

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Abbreviations

M -> Male
P -> Partner

a. P(Mblue or Pblue) = P(Mblue) + P(Pblue) - P(Mblue and Pblue)
= 114/204 + 108/204 - 78/204
= 144/204 = 0.7058

b. P(Pblue l Mblue) = P(Mblue and Pblue) / P(Mblue)
= (78/204) / (114/204) = 78/114 = 0.6842

c.
P(Pblue l Mbrown) = P(Pblue and Mbrown) / P(Mbrown) = (19/204) / (54/204) = 19/54 = 0.3518

P(Pblue l Mgreen) = P(Pblue and Mgreen) / p(Mgreen) = (11/204)/(36/204) = 11/36 = 0.3055

d. Eye color of male is not independent of partner's eye color.

Reason: P(Pblue) is not equal to P(Pblue l Mblue)
P(Pblue) = 108/204 = 0.5294
P(Pblue l Mblue) = 78/114 = 0.6842

The same can be inferred by looking at P(Pgreen) != P(Pgreen l Mgreen)

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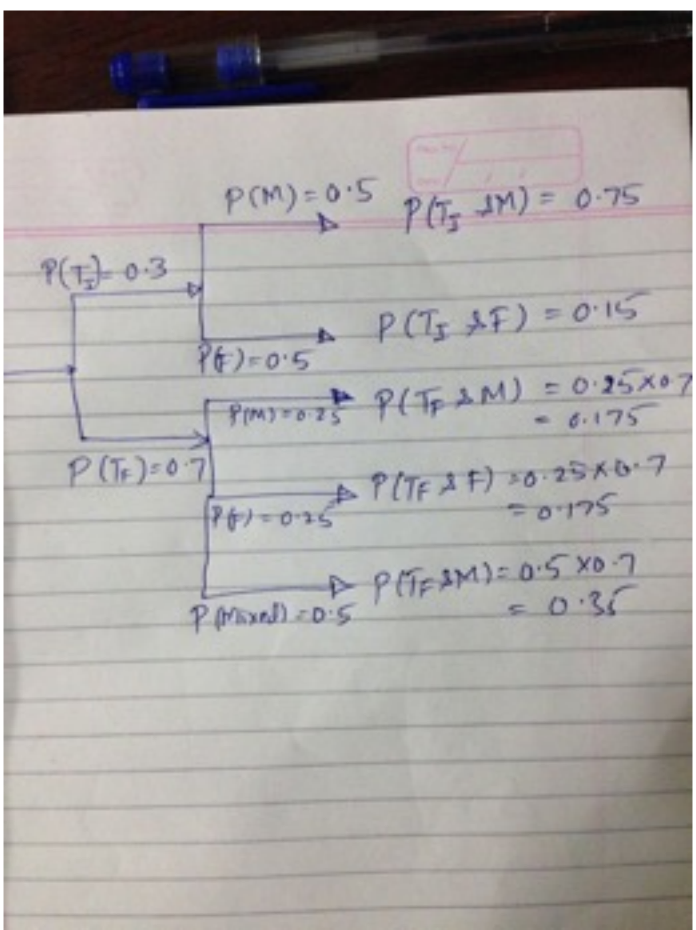
Abbreviation

Identical Twins - TI



Fraternal Twins - T_F

$P(\text{Identical Twins} \mid \text{Both are girls}) = P(T_I \text{ and } F) + P(T_F \text{ and } F)$
$= 0.15 + 0.175 = 0.325 = 32.5\ \%$