

Question 2:

Let the event of an employee traveling to England be E,
the event of an employee traveling to Italy be I
the event of an employee traveling to Spain be S.
the event of getting Covid is C.

and,

$$P(E) = 0.5$$

$$P(I) = 0.2$$

$$P(S) = 0.3$$

$$P(C|E) = 0.0012$$

$$P(C|I) = 0.0014$$

$$P(C|S) = 0.0018$$

$$\text{So } P(C) = P(C|E) * P(E) + P(C|I) * P(I) + P(C|S) * P(S) = 0.0012 * 0.5 + 0.0014 * 0.2 + 0.0018 * 0.3$$

$$P(C) = 0.00142 = 0.142\%$$

Now to find probability of traveling to England given Covid has been contracted.

$$P(E|C) = (P(C|E) * P(E)) / P(C) = (0.0012 * 0.5) / 0.00142$$

$$P(E|C) = 0.4225 = 42.25\%$$