Q1

Define Events

L : Event that student leaves class late

B : ——————————————— misses bus

Given

$P(L) = 30\%$

$P(B|L) = 45\%$

Ans:

$P(L \cap B) = P(B|L) \times P(L) = 0.135$

September 13, 2021 10:26 AM

Q2

(a) Assuming independence of tickets, by complimentary events: $1 - 0.324 = 0.676$

(b) Either (1) Independent trials + Product Rule

(2) Binomial Trials

$$\text{Ans} = (1-0.324)^6 \approx 0.09548$$

September 27, 2021 10:58 AM

Q2

(c) By independence of weeks:

Ans = $\underline{0.324}$

(d) Either: (1) Sum Rule + Product Rule

(2) Binomial(3, 0.324)

Let $w = P(\text{winning in a certain week})$

$$\text{Ans} = ww(1-w) + w(1-w)w + (1-w)ww$$

$$= \binom{3}{2} w^2 (1-w) \simeq \underline{0.2129}$$

September 22, 2021 10:26 AM

Q3

(a) F : Event 1st flight is on time

L : Event luggage makes it on flight (connecting)

Q: Is F independent of L?

A: $P(L|F) = 0.95$,

$P(L|\bar{F}) = 0.65$,

$P(\bar{F}) = 0.15$

↳

September 22, 2021 11:16 AM

$$P(L) = P(L|F)P(F) + P(L|\bar{F})P(\bar{F})$$

(Law of Total Probability)

$$= (.95)(.15) + (.65)(1 - .15)$$

$$= 0.695$$

$\therefore$ $P(L) \neq P(L|F)$, L & F are dependent

Q3(b) $P(L) = 0.695$

STAT 237 TUT 1

Q4] The sample space for tossing a pair of dice

$\Omega = \{(1,1), (1,2), (1,3), (1,4), \ldots$
$\ldots (6,3), (6,4), (6,5), (6,6)\}$

contains 36 elements

Let $L = \{$ sum is 7 $\}$

$= \{(1,6), (2,5), (3,4), (4,3), (5,2), (6,1)\}$

$M = \{$ The first die is 2 $\}$

$$P(M \mid L) = \frac{1}{6} = 0.1667$$

Theoretical probability

Simulation is given in R codes.