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CS 383

Professor Rattigan

Primer 4

1. From EXCEL:

								Probs
						E	30	0.25
P(E)	0.25					F	24	0.2
P(A E)	0.6333333					A	45	0.375
P(not A E)	0.3666667					T	24	0.2
P(F E)	0.7					A and E	19	0.1583333
P(not F E)	0.3					F and E	21	0.175
P(T E)	0.4					T and E	12	0.1
P(not T E)	0.6					F and A	21	0.175
P(A F)	0.875					F and T	18	0.15
P(not A F)	0.125							
P(T F)	0.75							

2.

- I do not expect Yoshimi to be enrolled in 383 because the total number of people enrolled versus not enrolled in 383 given in the csv is 30 to 90.
- Assuming that the expectation from part a is correct, then it is impossible for Yoshimi to have 383 fever because she is not enrolled in 383.
- The possibility of Yoshimi being excessively awesome is greater than the probability of her being both excessively awesome and testing positive for 383 fever. This is because the union of the two sets, being both excessively awesome and testing positive for 383 fever, is smaller than the independent event that she is excessively awesome.

- d. The possibility of Yoshimi being excessively awesome is less than the probability of her being excessively awesome or testing positive for 383 fever. When considering the set where Yoshimi is excessively awesome or tests positive for 383 fever, the set of Yoshimi only being excessively awesome is also included within this so $P(T)+P(A) > P(A)$.
 - e. Knowing that Yoshimi is excessively awesome, the new evidence that she tested positive for 383 fever does not change my degree of belief that she is enrolled. In order for her to be excessively awesome she must be enrolled in 383 in the first place so unless there is another cause of being excessively awesome, it would not be possible for her to be excessively awesome and not be enrolled in 383.
- 3.
- a. Seeing someone drinking Moxie does not affect my belief that they are enrolled in 383 because being enrolled in 383 and drinking Moxie are d-separated by being excessively awesome so they are independent events.
 - b. Seeing that someone is excessively awesome does slightly affect my belief that they are enrolled in 383 because being excessively awesome is d-connected to being enrolled in 383 but it is also possible that they are behaving excessively awesomely because they drank Moxie. So it cannot be assumed that they are enrolled in 383 just because they are behaving excessively awesomely.
 - c. Seeing someone enrolled in 383 drinks Moxie would not affect my degree of belief that they would test positive for 383 fever. Drinking Moxie is d-separated from having 383 fever while testing positive for 383 fever is d-connected being

enrolled in 383 so drinking Moxie would have no effect on my belief of whether that person would test positive.

- d. If someone who is excessively awesome and drinks Moxie is enrolled in 383, this would affect my degree of belief that they would test positive for 383 fever. This is because the symptom for 383 fever may not be caused by having 383 fever but rather from the fact that they drink Moxie as both being enrolled in 383 and drinking Moxie are d-connected to being excessively awesome.