

homework_1_bayes

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Sec 1.10 Exercises 2, 5, 6, 9, 12, 16, 17, 21, 22, 23

Problem 2

- a. Classical
- b. Subjective
- c. Subjective
- d. Classical
- e. Frequency
- f. Frequency

Problem 5

- a. 7/30
- b. 9/30
- c. 1 flip

Problem 6

- a. 8/20
- b. 7/20
- c. Somewhat unusual, given that 23.0 only happens once out of 20.

Problem 9

- a.
- a - 1/5 e - 1/5 i - 1/5 o - 1/5 u - 1/5
- b.
- a - .3 e - .35 i - .2 o - .10 u - .05
- c. No, some vowels, like e and a, occur much more than others, like u.
- d.

$$a - 61/250 = 0.244 \quad e - 63/250 = 0.252 \quad i - 34/250 = 0.136 \quad o - 70/250 = 0.280 \quad u - 22/250 = 0.088$$

Problem 12

- a.
- $S = \{(H, H, H), (H, H, T), (H, T, T), (T, T, T), (T, T, H), (T, H, H), (H, T, H), (T, H, T)\}$
- b.
- $S = \{(x, y, z) \mid x, y, z \in \{A, B, C\}\}$
- c.
- $S = \{(x, y, z) \mid x \in \{X_1, X_2, X_3\}, y \in \{Y_1, Y_2\}, z \in \{Z_1, Z_2\}\}$
- d.
- $S = \{(X_1, X_2, X_3) \mid X_i \in \{\text{Lucky, Best Girl, Stripes, Solid, Jokester}\}, X_1 \neq X_2 \neq X_3\}$
- e.
- $S = \{(X_1, X_2) \mid X_i \in \{0, 1, 2, \dots, 9\}\}$
- f.
- g. $S = \{(w, x, y, z) \mid w, x, y, z \in \{a, b, c, d\} \text{ and } w \neq x \neq y \neq z\}$
- h.

I = make O = miss

$$S = \{(O), (I, O), (I, I)\}$$

Problem 16

- a.
- Probably not... if this is a chess master I'd say for me:
0 games: 99.9% 1 game: .0099% 2 games: .0001%
- b.
- No, the probability of a random car BEING a corvette is 10%, so red corvette would be less than 10% (unless all of the corvettes are red).
- c.
- No, the percentage who play both sports HAS to be less than the percentage that plays golf or tennis (whichever lower), so must be less than 20%.
- d.

Yes, this is reasonable.

Problem 17

- a. any of them! equally likely to be any number of keys
- b. none of them are least likely
- c. 1/5 for each

Problem 21

- a.
- $(J, M, P), (J, P, M), (M, P, J), (M, J, P), (P, M, J), (P, J, M)$
- b.
- $P(M) = 1/3$
- $P(B) = 1/2$
- c.
- (M, J, P)
- (M, P, J)
- $P(M \cap B) = 1/3$
- d.
- $P(\bar{B}) = 1 - P(B) = 1/2$
- e.
- $P(M \cup B) = 1/2$

Problem 22

- a.
- $P(F) = 45/193$
- b.
- Yes, you can't be a freshman and a junior.
- c.
- $P(F \cup J) = 97/193$
- d.
- $P(F \cap M) = 25/193$
- e.
- $P(F \cup M) = 118/193$

Problem 23

- a.
- $S = A \cup \bar{A}$
- $A \cap \bar{A} = \emptyset$
- b.
- $P(S) = P(A \cup \bar{A}) = P(A) + P(\bar{A})$
- c.
- $P(S) = 1 = P(A) + P(\bar{A})$
- So ...
- $P(\bar{A}) = 1 - P(A)$