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Ling 473

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Assignment III

Question 1

- a) Probability of the total of two dices being 7: $\frac{12}{8^2} = \frac{3}{16} = 0.1875$
- b) Probability that the total will be 9 or higher: $\frac{19}{64} = 0.296875$
- c) Probability of red shows a higher number than white: $\frac{26}{64} = \frac{13}{32} = 0.40625$

Question 2

- a) The sample contains 157 bigrams.

b)

- a. The sample contains 158 unigrams.

b. $P(NN) = \frac{24}{158} = \frac{12}{79} = 0.1519$

c. $P(. | NN) \approx \frac{C(. \cap NN)}{C(NN)} = \frac{4}{24} = \frac{1}{6} = 0.1667$

c) $P(DT JJ) = \frac{6}{157} = 0.3822$

d) $P(NN | DT JJ) \approx \frac{C(NN \cap (DT JJ))}{C(DT JJ)} = \frac{5}{6} = 0.833$

e) $P((DT JJ) | NN) = \frac{P(NN | (DT JJ)) \times P(DT JJ)}{P(NN)} = \left(\frac{5}{6} \times \left(\frac{6}{157} \right) \right) / \left(\frac{24}{158} \right) = 0.2097$

Question 3

List	P(List is selected)	P(Selected word contains high/close vowel)
List A: {gnat, beet }	$\frac{1}{3}$	$\frac{1}{2}$
List B: {loon, fee }	$\frac{1}{3}$	1
List C: {peel, pool, he , sand}:	$\frac{1}{3}$	$\frac{3}{4}$

**highlights are words that contain high/close vowels

- a) Probability that the selected word will have a high/close vowel:

○ $\left(\frac{1}{3} \right) \times \left(\frac{1}{2} \right) + \left(\frac{1}{3} \right) \times 1 + \left(\frac{1}{3} \right) \times \left(\frac{3}{4} \right) = \left(\frac{3}{4} \right) = 0.75$

Question 4

- a) Let Event B_1 = the doc moved from C to \bar{C} mentioned the IL-2R α -promoter
- b) Let Event B_2 = the doc moved from C to \bar{C} did NOT mention the IL-2R α -promoter
- c) Let Event D = the doc from \bar{C} to C mentioned the IL-2R α -promoter
- d) $P(D) = P(B_1 \cap D) + P(B_2 \cap D) = \frac{2}{6} \times \frac{2}{3} + \frac{4}{6} \times \frac{1}{3} = \frac{8}{18} = \frac{4}{9} = 0.444$
- e) $P(B_1 | D) = \frac{P(B_1 \cap D)}{P(D)} = \frac{\frac{4}{18}}{\frac{4}{9}} = \frac{1}{2} = 0.5$