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Application Exercise 3.1: Voting probabilities of college students - KEY

Write your responses in the spaces provided below. WRITE LEGIBLY and SHOW ALL WORK! Concise and coherent are best!

The following table shows the distribution of class year and whether or not students voted in the last presidential election for 176 Sta 101 students.

	no, eligible but didn't	no, not eligible	yes	total
first-year	3	38	3	44
sophomore	10	40	14	64
junior	7	6	41	54
senior	4	1	9	14
total	24	85	67	176

Answer the following questions based on these data. Make sure to show all your work.

1. What is the probability that a randomly chosen student has voted in the last presidential election?

   P(voted) = 67 / 176 = 0.38

2. What is the probability that a randomly chosen student is a junior and has voted in the last presidential election?

   P(junior and voted) = 41 / 176 = 0.23

3. What is the probability that a randomly chosen student has voted in the last presidential election given that s/he is a junior?

   P(voted | junior) = 41 / 54 = 0.76

4. Categorize the three probabilities you calculated above as marginal, conditional, or joint.

   1. marginal, 2. joint, 3. conditional

5. What is the probability that a randomly chosen student is a junior or has voted in the last presidential election?

   P(junior or voted) = (67 + 54 - 41) / 176 = 0.45

6. What percent of students are junior or have voted in the last presidential election?

   Same as above, 45%.

7. What is the probability that a randomly chosen student has voted in the last presidential election given that s/he is a first-year? What about sophomore, and senior?

   P(voted | first-year) = 3 / 44 = 0.07
   P(voted | sophomore) = 14 / 64 = 0.22

P(voted | senior) = 9 / 14 = 0.64

8. Do these data suggest an association between class year and whether or not students have voted in the last presidential election? Explain your reasoning in one or two sentences.

   Yes, it does. Likelihood of voting varies by class year.