

Exercise set 2

Stat 251

- (1) The following table shows a random sample of musicians and how they learned to play their instruments. Use the table to answer the following questions:
- Probability the musician is a female
 - Probability the musician is a male and had private instruction
 - Probability the musician is a female or is self taught
 - Are the events “being a female musician” and “learning music in school” mutually exclusive events? Briefly explain.

Gender	Self-taught	Studied in School	Private Instruction	Total
Female	12	38	22	72
Male	19	24	15	58
Total	31	62	37	130

- (2) At a college, 72% of courses have final exams and 46% of courses require research papers. Suppose that 32% of courses have a research paper and a final exam. Let F be the event that a course has a final exam. Let R be the event that a course requires a research paper.
- Find the probability that a course has no final exam
 - Find the probability that a course has no research paper
 - Find the probability that a course has a final exam or a research project
 - Find the probability that a course has NEITHER of these two requirements
 - Find the probability that a course has no final and no research paper
- (3) In a box of assorted cookies, 36% contain chocolate and 12% contain nuts. Of those, 8% contain both chocolate and nuts. Sean is allergic to both chocolate and nuts.
- Find the probability that a cookie contains chocolate or nuts (he can't eat it)
 - Find the probability that a cookie does not contain chocolate or nuts (he can eat it)
- (4) Suppose that the PDF for the number of years it takes to earn a Bachelor of Science (B.S.) degree is given in the following table. Use the table to calculate the following:
- On average, how many years do you expect it to take for an individual to earn a B.S.?
 - Calculate VX
 - Calculate SDX

x	$P(x)$
3	0.05
4	0.40
5	0.30
6	0.15
7	0.10

- (5) At The Fencing Center, 60% of the fencers use the foil as their main weapon. We randomly survey 25 fencers at The Fencing Center. We are interested in the *number of fencers who do not use the foil* as their main weapon
- In words, define the random variable X
 - List the values that X may take on
 - Give the distribution of X in shorthand notation
 - How many are expected to not to use the foil as their main weapon?
 - Find the probability that six do not use the foil as their main weapon
 - Based on numerical values, would you be surprised if all 25 did not use foil as their main weapon? Justify your answer numerically.
- (6) It has been estimated that only about 30% of California residents have adequate earthquake supplies. Suppose you randomly survey 11 California residents. We are interested in the number who have adequate earthquake supplies
- In words, define the random variable X
 - List the values that X may take on
 - Give the distribution of X in shorthand notation
 - Find the probability that at least eight have adequate earthquake supplies
 - Is it more likely that none or that all of the residents surveyed will have adequate earthquake supplies? Why? Justify your answer numerically.
 - How many residents do you expect will have adequate earthquake supplies? Also, calculate VX , SDX

- (7) The average number of times per week that Mrs. Plum's cats wake her up at night because they want to play is ten. We are interested in the number of times her cats wake her up each week.
- (a) Give the distribution of X in shorthand notation
 - (b) Find the probability that Mrs. Plum is not awakened by her cats next week
 - (c) Find the probability that Mrs. Plum is will be awakened by her cats at least once next week
 - (d) On average, how many times will Mrs.Plum's cats wake her up (annoying twits that they are...)?
Also, calculate VX , SDX