

$$\int_M d\omega = \int_{\partial M} \omega$$

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Assignment #2 for: AKSHITA KUMAR (400509297)


Instructions:

1. Save your work occasionally (at least once every 15 minutes) or your session will be timed out and you will lose any unsaved work.
2. You can edit and change your answers as many times as you want before the deadline.
3. You can submit your work for grading a maximum of 3 times. (If you save your work but do not submit it for grading then it will automatically be submitted after the deadline.)

Topics: Descriptive Statistics and Probability
Sections Covered: 3.3, 4.1-4.3, 5.1-5.3, 6.1, 6.2



denotes questions that require the use of R. (R should NOT be used for any of the other questions.)

Problem #1:  Using the project `kumaa25_class.RData` that you created in Assignment #0, verify (using the `sum` command with the `na.rm=T` option) that the sum of the `study` column is equal to 1396.6 and (using the `table` command with the `programme` variable, as in Assignment #0) that 209 people in your data set are in Life Sciences, 4 are in chemistry, and 50 are in biology.

Work through [this example](#) on R and read [this example](#). Then using the project `kumaa25_class.RData` that you created in Assignment #0, use R to create side by side boxplots similar to [this example](#) for the time spent studying (`study`) for each programme (`programme`).

Use the results from the `boxplot` function for parts (a),(b), and (c) below.

- (a) Fill in the blank: Approximately 75% of the students in Life Sciences (`ls`) spend more than _____ hours studying per day.
- (b) Fill in the blank using the **middle** 50% of the data: Approximately half of the students in biology (`bio`) study between _____ and _____ hours per day.
- (c) What are the maximum and minimum time spent studying per day (in hours) in the entire data set?
- (d) What is the average time spent studying per day (in hours) for students in kinesiology (`kin`)?
- (e) What was the overall average time spent studying in the entire data set?
(Note: You can't average averages!)

Problem #1(a):

Problem #1(b): [separate your answers with a comma](#)

Problem #1(c): [maximum and minimum
separate your answers with a comma
the order doesn't matter](#)

Problem #1(d): [average](#)

Problem #1(e): [overall average time](#)

Problem #1	Attempt #1	Attempt #2	Attempt #3
Your Answer:	1(a) 1(b) 1(c) 1(d) 1(e)	1(a) 1(b) 1(c) 1(d) 1(e)	1(a) 1(b) 1(c) 1(d) 1(e)
Your Mark:	1(a) 1(b) 1(c) 1(d) 1(e)	1(a) 1(b) 1(c) 1(d) 1(e)	1(a) 1(b) 1(c) 1(d) 1(e)

Problem #2: In a family of 4 children, what is the probability that two of the children are boys and two of the children are girls?

Problem #2: answer correct to 4 decimals

Just Save

Submit Problem #2 for Grading

Problem #2	Attempt #1	Attempt #2	Attempt #3
Your Answer:	0.3750		
Your Mark:	2/2 ✓		


Problem #3: The CDC receives reports of 7.7 cases of typhoid fever per week, on average, from all over the United States. Assuming that the number of reported cases per week of typhoid fever follows a Poisson distribution, find the probability that there will be between 1 and 3 inclusive cases in the next week..

Problem #3: answer correct to 4 decimals

Just Save

Submit Problem #3 for Grading

Problem #3	Attempt #1	Attempt #2	Attempt #3
Your Answer:	0.0514		
Your Mark:	2/2 ✓		

Problem #4:  Verify (using the `table` command, as in Assignment #0) that 32 students in your data set are left-handed, 365 are right-handed (`handedness`), 261 are female, and 133 are male (`gender`).

Work through [this example](#) on R and then do the following using the project `kumaa25_class.RData` that you created in Assignment #0.

- (a) Create a cross-tabulation table that counts the students that are left or right handed (`handedness`) and whether they are male or female (`gender`). Be sure that the `handedness` variable is in the **rows** of your table.

Enter the counts from your cross-tabulation table by row (**not** including the `all` columns), into the answer box below, separated by commas. For example, if your cross-tabulation table looked the one in [this example](#), then you would enter the following numbers into the answer box:

17, 14, 7, 15, 18, 5, 8, 3, 2, 7, 2, 2

- (b) If a person from your data set is randomly selected, find the probability that they are right-handed and female.
- (c) If a person from your data set is randomly selected, find the probability that they are left-handed or male.
- (d) If a person from your data set is randomly selected, find the probability that they are left-handed, given that they are female.
- (e) If a person from your data set is randomly selected, find the probability that they are left-handed, given that they are male.
- (f) We want to see if the data suggests that females are more or less likely to be left-handed than males. How should this be done?

Problem #4(a): numbers from cross-tabulation table

Problem #4(b): answer correct to 4 decimals

Problem #4(c): answer correct to 4 decimals

Problem #4(d): answer correct to 4 decimals

Problem #4(e): answer correct to 4 decimals

(A) Compare the probabilities in (b) and (c). (B) Compare the probabilities in (b) and (e).

(C) Compare the probabilities in (c) and (d). (D) Look only at the probability in (b).

(E) Compare the probabilities in (b) and (d). (F) Compare the probabilities in (d) and (e).

(G) Compare the probabilities in (c) and (e). (H) Look only at the probability in (d).

Problem #4(f):

Problem #4	Attempt #1	Attempt #2	Attempt #3
Your Answer:	4(a)	4(a)	4(a)
	4(b)	4(b)	4(b)
	4(c)	4(c)	4(c)
	4(d)	4(d)	4(d)
	4(e)	4(e)	4(e)
	4(f)	4(f)	4(f)
Your Mark:	4(a)	4(a)	4(a)
	4(b)	4(b)	4(b)
	4(c)	4(c)	4(c)
	4(d)	4(d)	4(d)
	4(e)	4(e)	4(e)
	4(f)	4(f)	4(f)

Problem #5: Nine percent of men and 0.25% of women cannot distinguish between the colors red and green. This is the type of color blindness that causes problems with traffic signals.

(a) If 10 men are randomly selected for a study of traffic signal perceptions, find the probability that at least 2 of them have this type of color blindness.

(b) In a group of 300 men, find the mean number that are color blind.

(c) In a group of 300 men, find the standard deviation of the number that are color blind.

(d) Suppose that a group of 300 men are randomly selected, and 36 of them are color blind. Is this a significantly high number that would perhaps suggest that the given percentage of men that are color blind (i.e., 9%) is not correct?

Problem #5(a): answer correct to 4 decimals

Problem #5(b): answer correct to 2 decimals

Problem #5(c): answer correct to 2 decimals

- (A) Yes, because 36 is a lot. (B) Yes, because 36 out of 300 is 12%, which is a higher percentage than expected
 (C) No, because 36 is not a lot. (D) No, because 36 is less than 42. (E) No, because 36 is less than 36.91.
 (F) No, because 36 out of 300 is 12%, which is not much higher than expected.
 (G) Yes, because 36 is greater than 32.

Problem #5(d): E

Just Save

Submit Problem #5 for Grading

Problem #5	Attempt #1	Attempt #2	Attempt #3
Your Answer:	5(a) 0.2662 5(b) 27.00 5(c) 4.96 5(d) E	5(a) 0.2254 5(b) 5(c) 5(d)	5(a) 5(b) 5(c) 5(d)
Your Mark:	5(a) 0/2 ✗ 5(b) 1/1 ✓ 5(c) 1/1 ✓ 5(d) 2/2 ✓	5(a) 2/2 ✓ 5(b) 5(c) 5(d)	5(a) 5(b) 5(c) 5(d)

Problem #6: The percentage of adults who have at some point in their life been told that they have hypertension is 23.53%. In a sample of 13 adults, let X be the number who have been told that they have hypertension. Consider the following probability distribution for X .

x	$P(x)$
0	?
1	?
2	?
3	?
4	?
5	?
6	a
7	0.0137
8	0.0032
9	0.0005
10	0.0001
11	0.0000
12	0.0000
13	0.0000

- (a) Find the missing entry that is labelled as ' a '.
 (b) Suppose that a group of 13 adults are randomly selected, and 7 of them have been told that they have hypertension. Is this a significantly high number that would suggest that the given percentage of adults who have been told that they have hypertension (i.e., 23.53%) is not correct?

Problem #6(a): 0.0445 answer correct to 4 decimals

- (A) No, because 0.0137 is less than .05. (B) Yes, because 0.0175 is less than .05.
 (C) Yes, because 0.0445 is less than .05. (D) No, because 7 is not a lot more than expected.
 (E) Yes, because 7 is a lot more than expected. (F) No, because 0.0175 is less than .05.
 (G) Yes, because 0.0137 is less than .05. (H) No, because 0.0445 is less than .05.

Problem #6(b): B

Just Save

Submit Problem #6 for Grading

Problem #6	Attempt #1	Attempt #2	Attempt #3
Your Answer:	6(a) 0.0445 6(b) B	6(a) 6(b)	6(a) 6(b)
Your Mark:	6(a) 2/2 ✓ 6(b) 2/2 ✓	6(a) 6(b)	6(a) 6(b)

Problem #7: An 1868 paper by German physician Carl Wunderlich reported, based on over a million body temperature readings, that healthy adult body temperatures are approximately normally distributed with mean 98.6 degrees Fahrenheit and standard deviation 0.6.

- (a) Based on this study, what percentage of healthy adults have a body temperature that is below 98.4 degrees?
- (b) Fill in the blank. Approximately 90% of healthy adults have a body temperature that is above _____ (how many?) degrees.

Problem #7(a):

Enter your answer as a **percentage**, correct to **2 decimals**, without the % sign. e.g., 28.31

Problem #7(b):

answer correct to **2 decimals**

Just Save

Submit Problem #7 for Grading

Problem #7	Attempt #1	Attempt #2	Attempt #3
Your Answer:	7(a) 37.07 7(b) 97.83	7(a) 7(b)	7(a) 7(b)
Your Mark:	7(a) 2/2 ✓ 7(b) 2/2 ✓	7(a) 7(b)	7(a) 7(b)