childsmath

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

Stats 2B03 Su25
Assignment #3

kumaa25

« Back to Admin Page

Assignment #3 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: Central Limit Theorem, Assessing Normality, and Confidence Intervals
Sections Covered: 6.4, 6.5, 7.1, 7.2

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

Problem #1: Glaucoma is a disease of the eye that is manifested by high intraocular pressure. The distribution of intraocular pressure in the general population is approximately normal with mean 16 mm Hg and standard deviation 3 mm Hg. In a random sample of 70 people, find the probability that the average intraocular pressure is between 15.8 and 16.1.

Problem #1: [ ] answer correct to **4 decimals**

Just Save | Submit Problem #1 for Grading

Problem #1	Attempt #1	Attempt #2	Attempt #3
Your Answer:			
Your Mark:			

Problem #2: Consider the following data (which is also the data that you will be using in Problem #7 below):

8, 8, 12, 9, 10, 7, 8, 11, 8

(a) If you were to construct a normal probability plot by hand for the above data, what are the numerical values (in order) of the **first five** numbers that would go on the x-axis? Separate your answers with a comma.
For example, if your data was the same as the data from Example 1 in Section 6.5 of the textbook, then you would enter the following numbers from Step 1 into the answer box (note that spaces don't matter):
`125,229,234,236,257`

(b) If you were to construct a normal probability plot by hand for the above data, what are the numerical values (in order) of the **first five** numbers that would go on the y-axis? Separate your answers with a comma.
For example, if your data was the same as the data from Example 1 in Section 6.5 of the textbook, then you would enter the following numbers from Step 3 (note that spaces don't matter):
`-1.28, -0.52, 0, 0.52, 1.28`

(c) Work through this example, and then use R to construct a normal probability plot for the above data. Do not submit the normal probability plot, but instead enter the value of the `p-value` from the Anderson-Darling test into the answer box below.

(d) Is it reasonable to assume that the above data come from a population that follows a normal distribution?

Problem #2(a): [ ] first five x-values

Problem #2(b): first five *y*-values (answers rounded to **2 decimals**)

Problem #2(c): *p*-value

(A) Yes, because the *p*-value is greater than 0.10. **(B)** No, because the *p*-value is greater than 0.10.

(C) Yes, because the sample size is less than 30. **(D)** Yes, because the points do not fall close to a straight line.

(E) Yes, because the *p*-value is less than .05. **(F)** No, because the points fall close to a straight line.

(G) No, because the *p*-value is less than .05. **(H)** The results are inconclusive, since $0.05 \leq p\text{-value} \leq 0.10$.

Problem #2(d): Select

Just Save | Submit Problem #2 for Grading

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

Problem #3:

A sample of 136 hypertensive people were given an anti-hypertensive drug, and the drug was found to be *effective* in 55 of those people. (By *effective*, we mean that their diastolic blood pressure is lowered by at least 10 mm Hg as judged from a repeat measurement taken 1 month after taking the drug.)

(a) Find a 92% confidence interval for the true proportion of the sampled population for which the drug is effective.

(b) Using the results from the above mentioned survey, how many people should be sampled to estimate the true proportion of hypertensive people for which the drug is effective to within 4% with 99% confidence?

(c) If no previous estimate of the sample proportion is available, how large of a sample should be used in **(b)**?

Problem #3(a): confidence interval enter your answer in the form a,b (numbers correct to **3 decimals**)

Problem #3(b): How many should be sampled?

Problem #3(c): How many should be sampled?

Just Save | Submit Problem #3 for Grading

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

Problem #4:

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 `distance` column is equal to 8985.5.

Work through this example on R, and then do the following:

Using the project `kumaa25_class.RData` that you created in Assignment #0, find a 91% confidence interval for the proportion of people in this class who live at least 5 km from campus during the shool year (`distance`).

Problem #4: [ ] confidence interval
enter your answer in the form a,b

Just Save | Submit Problem #4 for Grading

Problem #4	Attempt #1	Attempt #2	Attempt #3
Your Answer:			
Your Mark:			

Problem #5:

 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 `height` column is equal to 24158.

Work through this example on R and then do the following:

(a) Using the project `kumaa25_class.RData` that you created in Assignment #0, find a 97% confidence interval for the average height (in inches) of a person in this class (`height`).

(b) Which of the following statements is true regarding part **(a)**?

Problem #5(a): [ ] confidence interval
enter your answer in the form a,b

(A) The population must be normal. **(B)** The population standard deviation σ must be known.

(C) The population must follow a *t*-distribution. **(D)** The population cannot follow a *t*-distribution.

(E) The population does not need to be normal because the sample size is greater than 30.

(F) The population mean must be inside the confidence interval.

Problem #5(b): Select

Just Save | Submit Problem #5 for Grading

Problem #5	Attempt #1	Attempt #2	Attempt #3
Your Answer:	5(a) 5(b)	5(a) 5(b)	5(a) 5(b)
Your Mark:	5(a) 5(b)	5(a) 5(b)	5(a) 5(b)

Problem #6:

You can download the entire class data set by clicking here. Your `kumaa25_class.RData` consists of a random sample from this entire class data set. Therefore the entire class data set is the population.

(**Note:** Do not use the entire class data set at all when doing Problem #5 above, or when doing any question part which asks you to use your personalized `kumaa25_class.RData` project.)

(a)  Find the population mean height μ.

(b) Is the population mean height μ contained in your confidence interval from Problem #5 above?

(c) Suppose that 532 students in this class complete Problem #5 above using their own personalized class data set. (Assume that all of those students get Problem #5 correct.) How many of those students, on average, would obtain a confidence interval that does **not** contain the population mean height μ?

Problem #6(a): [ ] answer correct to **3 decimals**

(A) No **(B)** Yes

Problem #6(b): Select

Problem #6(c): Round your answer to the nearest integer.

Just Save | Submit Problem #6 for Grading

Problem #6	Attempt #1	Attempt #2	Attempt #3
Your Answer:	6(a) 6(b) 6(c)	6(a) 6(b) 6(c)	6(a) 6(b) 6(c)
Your Mark:	6(a) 6(b) 6(c)	6(a) 6(b) 6(c)	6(a) 6(b) 6(c)

Problem #7: **(a)** The following data shows the number of hours that 9 hospital patients slept following the administration of a certain anesthetic.

8, 8, 12, 9, 10, 7, 8, 11, 8

Find a 99% confidence interval for the average hours slept following the administration of the anesthetic for the sampled population.

(b) Which of the following statements is true regarding part **(a)**?

Problem #7(a): confidence interval
enter your answer in the form a,b
(numbers correct to **2 decimals**)

(A) The population standard deviation σ must be known. **(B)** The population must be normal.

(C) The population mean must be inside the confidence interval. **(D)** The population must follow a *t*-distribution.

(E) The population does not need to be normal.

Problem #7(b): Select

Just Save | Submit Problem #7 for Grading

Problem #7	Attempt #1	Attempt #2	Attempt #3
Your Answer:	7(a) 7(b)	7(a) 7(b)	7(a) 7(b)
Your Mark:	7(a) 7(b)	7(a) 7(b)	7(a) 7(b)