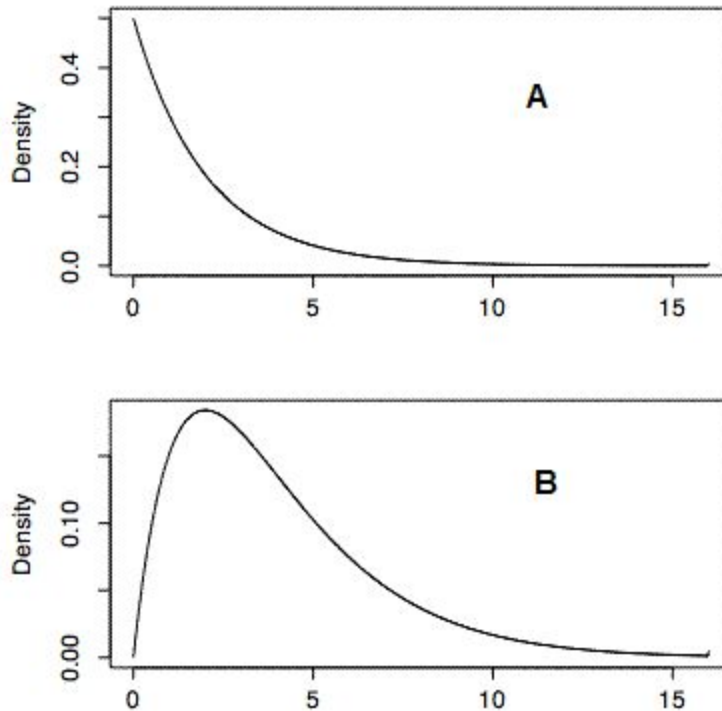




- 1) Which of the two Chi-Square distributions shown below (A or B) has the larger degrees of freedom?



- a) A
 - b) B
 - c) Both are equal
 - d) Not enough data provided
- 2) Which of the following sentences emphasises the Type-II error in hypothesis testing?
- a) Saying that a woman is pregnant when she is not
 - b) Saying that a woman is pregnant when she is in fact pregnant
 - c) Saying that a man is not pregnant when he is not
 - d) Saying that a man is pregnant when he is not



3) An Industry produces cylindrical components for the automotive industry. The mean of the component produced by this process is 5.4 millimetres. The engineer involved conjectures that the population mean is 5.4 mm. An experiment was conducted in which 120 parts produced by the process are selected randomly and the diameter measured. It is known that the population standard deviation σ is 0.14. The experiment gives a sample average diameter of $\bar{x} = 5.418$ mm. Does this sample information appear to support or refute the engineer's conjecture?

- a) Yes
- b) No
- c) Can't say
- d) The question doesn't make sense

4) We took two samples A and B from a population. If the degrees of freedom is 6 and we found that the within-group variance is 3.4 and between-group variance is 42.18. Would you say the deviance observed is just by chance or not?

- a) The deviance is by chance
- b) There is a relationship
- c) Data is insufficient
- d) Can't say

5) What are correlation and covariance? Explain.



6) A survey was conducted by the Indian government to firms doing business with firms in China. A random sample of 54 responses to the questionnaire yielded a mean of 11.566 years and the standard deviation observed is 8.4 years. Construct a 90% confidence interval for the mean number of years that a company has been trading with firms in China.

7) What is the key difference between one-way ANOVA and a t-test?

- a) You can have more than 2 groups in ANOVA
- b) They are the same test just with different calculations
- c) T-tests split variance into within and between
- d) ANOVA is about the mean and t-test is about the variance

8) Mr Piano Man has been tried for murdering his wife. Set the null and alternate hypotheses for this case.



- 9) The manager of a high school cafeteria is planning to offer several new types of food for student lunches in the following school year. She wants to know if each type of food will be equally popular so she can start ordering supplies. To find out, she selects a random sample of 100 students and asks them, "Which type of food do you prefer: Asian food, Mexican food, pizza, or hamburgers?" Here are the data in the table provided. Identify the p-value and decide which of the following is the most appropriate conclusion?

Type of Food:	Asian	Mexican	Pizza	Hamburgers
Count:	18	22	39	21

- a) Because 0.0129 is less than $\alpha = 0.05$, fail to reject H_0 . There is convincing evidence that food choices are equally popular.
 - b) Because 0.0289 is less than $\alpha = 0.05$, reject H_0 . There is convincing evidence that food choices are not equally popular.
 - c) Because 0.0289 is less than $\alpha = 0.05$, fail to reject H_0 . There is no convincing evidence that food choices are equally popular.
 - d) Because 0.0129 is less than $\alpha = 0.05$, reject H_0 . There is convincing evidence that food choices are not equally popular.
- 10) What is the Central Limit Theorem? and write a function in python to demonstrate it.