STATISTICAL TECHNIQUES LIND 14TH EDITION SOLUTION

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Statistical Techniques, 14th Edition: Comprehensive Solutions

Question 1:

In a study conducted to determine the relationship between smoking and lung cancer, the researcher obtained the following results:

Smoking Lung Cancer

Yes   50

No   25

Using the chi-square test, determine if there is a significant association between smoking and lung cancer.

Answer:

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?² = [(50 – 25)² / 25] + [(25 – 50)² / 50] = 20
df = 1

p-value = P(?² ? 20) = 0.0001 (using a chi-square distribution table)
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Since the p-value is less than 0.05, we conclude that there is a statistically significant association between smoking and lung cancer.

Question 2:

A company claims that a new advertising campaign will increase sales by 15%. To test this claim, a random sample of 100 customers were selected and their sales were recorded before and after the campaign. The average increase in sales was 10% with a standard deviation of 6%. Using a one-sample t-test, determine if the claim is valid.

Answer:

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t = (10% - 15%) / (6% / ?100) = -5.0
df = 99
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p-value = P(t ? -5.0) = 0.00001 (using a t-distribution table)
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Since the p-value is less than 0.05, we reject the claim and conclude that the advertising campaign did not increase sales by 15%.

Question 3:

A researcher wants to estimate the mean weight of students at a particular university. A random sample of 50 students was selected and their weights were recorded. The sample mean was 150 pounds with a sample standard deviation of 10 pounds. Using a 95% confidence interval, estimate the population mean weight.

Answer:

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t* = 2.009 (using a t-distribution table with df = 49)
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Margin of error = t* * (10 pounds / ?50) = 2.83 pounds
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95% Confidence Interval: (150 pounds - 2.83 pounds, 150 pounds + 2.83 pou
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We are 95% confident that the population mean weight is between 147.17 pounds and 152.83 pounds.

Question 4:

Two competing brands of a particular product were tested to determine which one lasts longer. A sample of 10 units from each brand was randomly selected and tested. The following results were obtained:

Brand A Brand B

10	12
12	14
8	10
10	12
9	11
11	13
8	10
10	12
9	11
11	13

Using a two-sample t-test, determine if there is a significant difference in the mean lifetime of the two brands.

Answer:

```
t = (10 - 12) / (?((10^2 + 12^2) / (10 + 10 - 2)) / ?(10 + 10)) = -1.26

df = 18

p-value = P(t ? -1.26) = 0.12 (using a t-distribution table)
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Since the p-value is greater than 0.05, we fail to reject the null hypothesis and conclude that there is no statistically significant difference in the mean lifetime of the two brands.

Question 5:

A manufacturer claims that the proportion of defective items in a particular production process is 5%. To verify this claim, a random sample of 200 items was inspected and 12 of them were found to be defective. Using a one-proportion z-test, determine if the manufacturer's claim is valid.

Answer:

```
z = (12/200 - 0.05) / (?(0.05 * 0.95) / ?200) = -2.0
p-value = P(z ? -2.0) = 0.0456 (using a standard normal distribution tabl
```

Since the p-value is less than 0.05, we reject the manufacturer's claim and conclude that the proportion of defective items is not 5%.

XBRL for Dummies: A Beginner's Guide

What is XBRL?

XBRL (eXtensible Business Reporting Language) is a global standard for electronic reporting of financial and business data. It allows companies to create reports that can be easily understood and processed by computers.

Why is XBRL important?

XBRL makes it easier for companies to:

- Share data with stakeholders, such as investors and regulators
- Improve transparency and accuracy in reporting
- Reduce the cost of compliance

How does XBRL work?

XBRL uses a set of tags to identify different types of financial and business data. These tags are based on the International Financial Reporting Standards (IFRS) and can be used to create reports on a variety of topics, such as income statements, balance sheets, and cash flow statements.

What are the benefits of using XBRL?

Some of the benefits of using XBRL include:

- Increased efficiency in data sharing
- Improved accuracy and transparency in reporting
- Reduced costs of compliance

How do I get started with XBRL?

To get started with XBRL, you will need to:

- Learn the basics of XBRL tagging
- Find a software tool that supports XBRL
- Create a report in XBRL format

Un, Deux, Trois, Nous Irons en Croix: A Mysterious Rhyme Explored

The enigmatic phrase "un, deux, trois, nous irons en croix" has captivated the imaginations of generations. This cryptic saying, often associated with children's games, raises intriguing questions about its origins and meaning.

What does the phrase mean?

The most common interpretation suggests that the phrase describes children playing a game where they line up and then jump or hop over a cross-shaped object. The numbers "un, deux, trois" indicate the counting off for the start of the game.

Where does the phrase come from?

The exact origin of the phrase is unknown. However, it has been documented in French folklore for centuries. Similar phrases exist in other languages, such as "eeny, meeny, miny, moe" in English.

What is the historical context of the phrase?

Some historians believe that the phrase may have originated as a mnemonic for remembering the order of the four evangelists in the Bible: Matthew, Mark, Luke, and John. The cross in the phrase would represent the crucifix upon which Jesus was said to have died.

Are there any other interpretations of the phrase?

Beyond its literal meaning as a game, the phrase has also been interpreted symbolically. Some see it as a metaphor for the challenges and trials of life. Others suggest that it represents the cyclical nature of existence, as the cross symbolizes both suffering and redemption.

Conclusion

The phrase "un, deux, trois, nous irons en croix" remains an enigma, with its origins and meaning still debated. Whether it is a simple children's rhyme, a religious mnemonic, or a profound metaphor, this enigmatic saying continues to captivate the human imagination.

How many pages is Perry's Chemical Engineering Handbook?

Is there a lot of memorization in chemical engineering? In CHE, memorizing stuff is not important, but the way you THINK is. This retraining the brain to think like an engineer is trivial for some people, not hard for others, and nearly impossible for others that just don't understand how to apply concepts.

What is the Bible for chemical engineers? Sometimes referred to as "the chemical engineer's bible", Perry's has to be one of the most well known and used reference texts of all time.

What is the hardest class in chemical engineering? Chemical Reaction Engineering: This course dives into the design and analysis of chemical reactors, by examining the kinetics of chemical reactions and various reactor types. Students often find this course difficult due to the complex mathematical models required to describe and predict reactor performance.

Is chemical engineering harder than chemistry? It is generally regarded that chemical engineering is harder, because of all the advanced chemistry.

Is chemical engineering one of the hardest majors? Novik's list ranks chemical engineering as the hardest major in this field. This might be because chemical engineers' unique training involves concepts from across many other STEM disciplines, including chemistry, biology, math, and physics.

Who is the father of chemical engineering? George Edward Davis (1850–1907) is regarded as the founding father of the discipline of chemical engineering.

Who is the famous chemical engineer? Linus Pauling, who won the Nobel Prize in Chemistry in 1954 and the Nobel Peace Prize in 1962, was a chemist and chemical engineer. Lee Raymond, a former Chairman and CEO of ExxonMobil, is a chemical

engineer.

Are chemical engineers hands on? Chemical Engineering Labs Here you work hands-on with flow systems ranging from commercial pipes to microfluidic cells; heat exchangers; chemical and biological reactors; separation systems such as distillation, absorption, cooling towers, liquid extraction and membrane air separations; as well as other experiments.

> [xbrl for dummies](#), [un deux trois nous irons en croix](#), [perrys chemical engineers handbook eighth](#)

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