

STATISTICS FOR BUSINESS AND ECONOMICS 11TH EDITION SOLUTIONS

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Question 1: Confidence Intervals for a Population Mean

Suppose a sample of 50 students is selected from a population with a known standard deviation of 10. The sample mean is 75. Find a 95% confidence interval for the population mean.

Answer:

Using the formula for a confidence interval for a population mean, we get:

$$\bar{X} \pm z_{\alpha/2} \left(\frac{s}{\sqrt{n}} \right) = 75 \pm 1.96 \left(\frac{10}{\sqrt{50}} \right) = 75 \pm 5.64$$

Therefore, the 95% confidence interval for the population mean is (69.36, 80.64).

Question 2: Hypothesis Testing for a Population Proportion

A company claims that 60% of its customers are satisfied with its service. A sample of 100 customers is taken, and 55 are found to be satisfied. Test the null hypothesis that the true proportion of satisfied customers is 60% against the alternative hypothesis that it is not equal to 60%.

Answer:

The test statistic is given by:

$$z = (\bar{p} - p) / \sqrt{p(1-p)/n} = (0.55 - 0.60) / \sqrt{0.60(1-0.60)/100} = -2.83$$

The critical values for a two-tailed test at a significance level of 0.05 are ± 1.96 . Since the test statistic (-2.83) is less than the critical value (-1.96), we reject the null hypothesis and conclude that there is sufficient evidence to suggest that the true proportion of satisfied customers is not equal to 60%.

Question 3: Regression Analysis

A company collects data on sales revenue and advertising expenditure. The following model is fitted:

$$Y = 50 + 0.1X$$

where Y is sales revenue and X is advertising expenditure.

a) Interpret the intercept. b) Interpret the slope.

Answer:

a) The intercept (50) represents the predicted sales revenue when advertising expenditure is zero.

b) The slope (0.1) represents the increase in sales revenue for each additional dollar spent on advertising.

Question 4: Forecasting

A company uses the exponential smoothing method to forecast demand for its product. The smoothing constant is 0.2. The actual demand for the last three periods was:

Period 1: 50 units Period 2: 60 units Period 3: 70 units

What is the forecast for period 4?

Answer:

The forecast for period 4 is given by:

$$F4 = 0.2 \ 70 + 0.8 \ 60 = 56 \text{ units}$$

Question 5: Correlation and Causation

A study finds a strong positive correlation between the number of ice cream sales and the number of drownings. Can we conclude that eating ice cream causes drowning?

Answer:

No, we cannot conclude that eating ice cream causes drowning. Correlation does not imply causation. There could be a third factor, such as hot weather, that is causing both ice cream sales and drownings to increase.

What was the imperial harem of the sultans? The imperial harem occupied a large section of the private apartments of the sultan at the Topkapi Palace which encompassed more than 400 rooms. The harem had been moved to Topkapi in the early 1530s. After 1853, an equally lavish harem quarter was occupied at the new imperial palace at Dolmabahçe.

What was the purpose of a harem? The purpose of a harem is to protect women from inappropriate contact with men. Closely linked with the term haram, meaning forbidden, the word conveys a sense of sacredness and inviolability. Only husbands and relatives may enter this part of the home. Harems existed in the Middle East long before the rise of Islam.

Were all Ottoman sultans fat? Nineteen of 36 dynasty members (53%) had fatal or non-fatal cardiovascular events. Twenty-nine of the dynasty (81%) members were either depicted as truncal obese or reported to have obesity.

What was the largest harem in history? The largest harems were improbably large. The 6th-century BCE King Tamba of Banaras (India) is rumored to have had a harem of 16,000. Kublai Khan, the 13th-century Mongol leader, had four queens and 7,000 concubines.

Why did sultans have so many concubines? Ottoman tradition relied on slave concubinage along with legal marriage for reproduction. Slave concubinage was the

taking of slave women for sexual reproduction. It served to emphasize the patriarchal nature of power (power being "hereditary" through sons only).

What was the imperial harem of Akbar? Akbar's imperial harem was re-organized into a fortress-like institution which is quite in contrast to the image of the reigns of Babur and Humayun. Harbans Mukhia attributed this change to the growing influence of Rajput cultural ethos on Akbar ever since his marriage in 1562 to Mariam-uz-Zamani.

Which sultan killed his harem? By the end, even his mom wanted him gone. Sultan Ibrahim "the Mad" of the Ottoman Empire was known for his sadistic and depraved behavior, including the murder of his entire harem. He was a weak and ineffective leader, draining the palace coffers with his whims and losing territory to other powers.

The Art and Science of Personality Development: A Q&A

Personality development is a complex and multifaceted process influenced by both innate traits and environmental factors. Understanding the intricacies of personality can empower individuals to maximize their potential and navigate life's challenges more effectively. Here are some key questions and answers that shed light on the art and science of personality development:

1. What is personality?

Personality refers to the unique combination of thoughts, feelings, behaviors, and motivations that make an individual who they are. It is often described using traits, which are stable characteristics that endure over time and across situations.

2. How does personality develop?

Personality development is a lifelong process that begins in infancy and continues throughout adulthood. It is influenced by both genetic factors and experiences, including interactions with parents, peers, and the wider social environment.

3. Can personality be changed?

While certain aspects of personality are relatively stable, it is possible to make meaningful changes through intentional effort. Therapy, self-reflection, and behavioral interventions can help individuals modify unhealthy patterns and develop more adaptive traits.

4. Why is personality development important?

A well-developed personality is essential for well-being, success, and fulfilling relationships. It allows individuals to understand themselves, cope with stress, achieve their goals, and contribute to society in a positive way.

5. How can I improve my personality?

Personality improvement requires self-awareness, motivation, and a commitment to growth. Start by identifying your strengths and weaknesses, setting realistic goals, and engaging in activities that challenge you and foster personal development. Seek support from trusted friends, family members, or professionals who can provide guidance and encouragement along the way.

Zig-Zag: The Surprising Path to Greater Creativity

By Robert Keith Sawyer

Zig-zagging, the unexpected deviation from a straight path, is often seen as a sign of confusion or hesitation. However, in the realm of creativity, it can be a powerful tool that leads to groundbreaking ideas.

What is Zig-Zagging?

Zig-zagging is the process of deviating from one's usual thinking patterns or routines. It involves exploring unfamiliar territory, embracing unconventional ideas, and challenging established norms.

How Does Zig-Zagging Foster Creativity?

Zig-zagging exposes us to new perspectives, breaks down mental barriers, and stimulates the brain to generate novel connections. By stepping outside our comfort zones, we force ourselves to think differently, experiment with unconventional

approaches, and find inspiration in unexpected places.

Why Zig-Zagging is Counterintuitive

To the uncreative mind, zig-zagging may seem counterproductive. It involves wasting time on seemingly unrelated activities and straying from the direct path. However, studies have shown that embracing detours and distractions actually enhances creativity.

Examples of Zig-Zagging in Action

Famous inventors and artists throughout history have used zig-zagging to their advantage. For example, Leonardo da Vinci studied anatomy to enhance his art, while Albert Einstein drew inspiration from the theory of relativity to develop his general theory.

Conclusion

Zig-zagging, while counterintuitive, is an essential ingredient in the creative process. By embracing detours, exploring unfamiliar territory, and challenging established norms, we unlock the hidden potential of our minds and pave the path towards groundbreaking ideas. So next time you find yourself veering off course, embrace the opportunity to enhance your creativity and lead yourself down the surprising path to success.

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