Assignment - 2

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Problem - 1

Using ‘VehicleFailureData’, summarize ‘Mileage at Failure’ by obtaining:

1. Mean: `=AVERAGE(C:C)` = 20578.67
2. Median: `=MEDIAN(C:C)` = 17000.00
3. Mode: `=MODE.SNGL(C:C)` = 5.00
4. 10th percentile: `=PERCENTILE.EXC(C:C,0.1)` = 416.50
5. 90th percentile: `=PERCENTILE.EXC(C:C,0.9)` = 45455.00
6. 1st quartile: `=QUARTILE.EXC(C:C,1)` = 5793.00
7. Total Count: `=COUNT(C:C)` = 1624.00
8. Sum: `=SUM(C:C)` = 33419760.00
9. Range: `=MAX(C:C)-MIN(C:C)` = 99982.00
10. Standard deviation: `=STDEV.S(C:C)` = 18275.69

Problem - 2

Public transportation and the automobile are two methods an employee can use to get to work each day. Samples of times recorded in minutes for each method are shown.

Public Transportation	28	29	32	37	33	25	29	32	41	34
Automobile	29	31	33	32	34	30	31	32	35	33

a) Compute the sample mean time to get to work for each method. (Write Excel function)

Public Transportation: `=AVERAGE(A:A)` = 32

Automobile: `=AVERAGE(B:B)` = 32

b) Compute the Standard deviation for each method. (Write Excel function)

Public Transportation: `=STDEV.S(A:A)` = 4.642796092

Automobile: `=STDEV.S(B:B)` = 1.82574186

c) Based on your results from parts (a) & (b), which method of transportation should be preferred? Explain.

The data reveals that the standard deviation for travel times in automobiles is 1.83, significantly lower than the standard deviation for public transportation, which is 4.64. This indicates that travel times by car exhibit greater consistency and less variability in comparison to public transportation.

Problem - 3

Closing stock market prices for Apple and Microsoft during a week in January 2012 were as given below: (Write Excel function)

Apple	Microsoft
$447.28	$29.23
$444.63	$29.50
$446.66	$29.56
$420.41	$29.34
$427.41	$29.73

Calculate coefficient of variation (CV) for each company. (Write Excel function)

Formula for Coefficient of Variation is: $\frac{\text{Standard Deviation}}{\text{mean}} \times 100$

`=STDEV.S(A2:A6)/AVERAGE(A2:A6)*100`

	Apple	Microsoft
Range	26.87	0.50
IQR	23.06	0.36
Variance	156.01	0.04
Standard Deviation	12.49	0.19
Coefficient of Variation	2.86	0.66

Problem - 4

Shown below are the top nine leading retailers in the United States in a recent year according to Kantar consulting.

Company	Revenues ($ billions)
Walmart	374.80
The Kroger Co.	115.89
Amazon	102.96
Costco	93.08
The Home Depot	91.91
Walgreens Boots Alliance	82.75
CVS Health Corporation	79.54
Target	71.88
Lowe's Companies	63.13

Assume that the data represent a population.

1. Find the mean: `=AVERAGE(B2:B10)` = 119.548889
2. Find the range: `=MAX(B2:B10)-MIN(B2:B10)` = 311.67
3. Find the population variance: `=VAR.P(B2:B10)` = 8368.50023
4. Find the population standard deviation: `=STDEV.P(B2:B10)` = 91.4795072

a. mean	119.55
b. range	311.67
c. variance	8368.50
d. standard deviation	91.48

Case Study:

a) Your discussion should include a summary for each variable in the data set. Make comments and interpretations based on appropriate means and proportions. What new insights do these descriptive statistics provide concerning Asia-Pacific business schools?

- **Variable: Business School**
  - **Summary:** The names of the business schools in the Asia-Pacific region are represented by this variable in the dataset. The information contains enrollments that range from 12 pupils to 463 students.
  - **Comments and Interpretations:** For the purpose of identifying the institutions being examined in this dataset, the list of business schools' names is essential. It offers insightful information on the program sizes at these Asia-Pacific business schools in addition to enrollment data. These institutions have a wide range of program sizes, with an average attendance of roughly 165 students and a median enrolment of 138. The majority of schools have smaller class sizes, however some have bigger cohorts. For prospective students and administrators to make educated decisions about class resources, competitive settings, and educational experiences at these schools, they must be aware of these disparities in class sizes.

- **Variable: Full-Time Enrollment**
  - **Summary:** The "Full-Time Enrollment" variable in the dataset represents the number of full-time students at 25 Asia-Pacific business schools.
  - **Descriptive Statistics:** On average, these schools have approximately 165.16 students enrolled full-time, with a median enrollment of about 138 students.
  - **Comments and Interpretations:** These statistics indicate significant variation in program sizes among the schools. The average enrollment provides a general idea of class sizes and resource allocation. Most schools have sizable MBA cohorts, although some exceptions have larger classes. This information helps prospective students and institutions assess program competitiveness and resource needs.

- **Variable: Students per Faculty**
  - **Summary:** This variable indicates the ratio of students to faculty members at each business school.
  - **Descriptive Statistics:** On average, the student-to-faculty ratio across the 25 business schools is approximately 8.48.
  - **Comments and Interpretations:** The average student-to-faculty ratio of 8.48 suggests variations in class sizes. Some schools may offer smaller, more personalized learning environments with lower ratios, while others may have larger classrooms with potentially less individualized attention.

- **Variable: Local Tuition ($)**
  - **Summary:** This variable represents the tuition fees in U.S. dollars for local students.
  - **Descriptive Statistics:** On average, the local tuition cost across the 25 business schools is approximately $12,374.92.
  - **Comments and Interpretations:** The mean local tuition cost of around $12,374.92 offers insights into the financial accessibility of MBA programs in the Asia-Pacific region for local students. It helps gauge the financial commitment required by local students pursuing an MBA education.

- **Variable: Foreign Tuition ($)**
  - **Summary:** This variable represents the tuition fees in U.S. dollars for foreign students.
  - **Descriptive Statistics:** On average, the foreign tuition cost across the 25 business schools is approximately $16,581.80.
  - **Comments and Interpretations:** The mean foreign tuition cost of about $16,581.80 sheds light on the financial investment required by international students to pursue an MBA at these Asia-Pacific business schools. It's a crucial consideration for students coming from abroad, indicating the financial commitment needed for studying in the region. Higher foreign tuition costs may influence the appeal of these schools for prospective international students.

- **Variable: Age**
  - **Summary:** This variable represents the age of the business schools.
  - **Descriptive Statistics:** On average, the age of business schools across the 25 in the dataset is approximately 28.36 years.
  - **Comments and Interpretations:** The average age of 28.36 years suggests that most MBA students in these schools enroll in their late twenties or early thirties. This insight is valuable for prospective students who are contemplating the timing of their MBA education. It indicates that many students choose to pursue their MBA after gaining several years of professional experience, aligning with the typical career trajectory.

- **Variable: %Foreign**
  - **Summary:** This variable represents the percentage of foreign students in the MBA programs.
  - **Descriptive Statistics:** On average, the percentage of foreign students across the 25 business schools is approximately 28.08%.
  - **Comments and Interpretations:** A higher mean percentage suggests that a substantial portion of the student body consists of international students. This contributes to creating a diverse and global learning environment within these business schools. Institutions with a greater percentage of foreign students often offer a more cosmopolitan and culturally diverse educational experience. This diversity can be appealing to both local and international students, enriching the learning environment and providing exposure to a wide range of perspectives and backgrounds.

- **Variable: GMAT**
  - **Summary:** This variable represents GMAT scores, commonly used for MBA admissions.
  - **Proportions:** Approximately 56% of the business schools in the dataset require GMAT for admission, while approximately 44% of the business schools do not require GMAT for admission.
  - **Counts:** Out of the 25 business schools, 14 require GMAT for admission, while 11 do not require GMAT for admission.

- **Comments and Interpretations:** The data indicates that the majority of MBA programs in the Asia-Pacific region (56% of schools) require the GMAT for entrance, aligning with a widespread global practice. However, it's noteworthy that a substantial portion of institutions (44%) in the region have different admission requirements or may place more emphasis on other aspects of applicants' profiles. This diversity in admission policies reflects the flexibility and consideration for different applicant profiles among business schools in the area.

GMAT	Count	Proportion
Yes	14	56%
No	11	44%

- **Variable: English Test**
  - **Summary:** This variable indicates whether schools require an English proficiency test for admission.
  - **Proportions:** Approximately 32% of the business schools in the dataset require an English language proficiency test for admission, while approximately 68% of the business schools do not require it.
  - **Counts:** Out of the 25 business schools, 8 require an English language proficiency test for admission, while 17 do not.
  - **Comments and Interpretations:** Prospective international students, especially non-native English speakers, should carefully review the admission requirements of each school to ensure they meet the language standards. Schools that do not demand an English language competency test may attract a more diverse applicant pool, as they are perceived as more welcoming and accessible to overseas students. This flexibility in language requirements can enhance the attractiveness of these schools to a broader range of international applicants.

English Test	Count	Proportion
Yes	8	32%
No	17	68%

- **Variable: Work Experience**

- **Summary:** This variable represents the work experience required for admission.
- **Proportions:** Approximately 76% of the business schools in the dataset require work experience for admission, while approximately 24% of the business schools do not require it.
- **Counts:** Out of the 25 business schools, 19 require work experience for admission, while 6 do not.
- **Comments and Interpretations:** The data shows that a significant majority of schools (76%) in the Asia-Pacific region consider work experience as a prerequisite for admission to their MBA programs. This emphasizes the high value placed on professional experience by these programs. For prospective students, particularly those considering MBA programs immediately after completing their undergraduate degrees, it's crucial to be aware of these work experience requirements and plan their career paths accordingly. Understanding the admission criteria helps students make informed decisions about when and where to pursue their MBA education.

Work Experience	Count	Proportion
Yes	19	76%
No	6	24%

- **Variable: Starting Salary ($)**
  - **Summary:** This variable represents the starting salaries of MBA graduates.
  - **Descriptive Statistics:** The mean (average) starting salary across the 25 business schools is approximately $37,292.
  - **Comments and Interpretations:** Starting salaries can vary significantly due to factors such as the school's reputation, location, industry demand, and individual qualifications. Therefore, it's important to understand that this statistic serves as a valuable reference point for prospective students. The mean starting salary of around $37,292 provides insights into the earning potential of graduates from these Asia-Pacific business schools at the outset of their careers. It helps students assess the potential return on investment associated with pursuing an MBA from these institutions.

b) Summarize the data to compare the following:

i) Any difference between local and foreign tuition costs.

To summarize the difference between local and foreign tuition costs based on the provided data, we can calculate the means for both the "Local Tuition ($)" and "Foreign Tuition ($)" columns and then compare them. Here's a summary:

- Mean Local Tuition Cost: **$12374.92**
- Mean Foreign Tuition Cost: **$16581.8**

Based on the means, we observe that the mean foreign tuition cost is higher than the mean local tuition cost. This suggests that, on average, foreign students in these MBA programs tend to pay more in tuition compared to local students. The difference between the mean local and foreign tuition costs can be indicative of the financial considerations international students should be aware of when planning to study at these Asia-Pacific business schools.

ii) Any difference between mean starting salaries for schools requiring and not requiring work experience.

To summarize the difference between mean starting salaries for schools requiring and not requiring work experience based on the provided data, we can calculate the means of starting salaries for both categories. Here's a summary:

- Mean Starting Salary for Schools Requiring Work Experience: **$41305.26**
- Mean Starting Salary for Schools Not Requiring Work Experience: **$24583.34**

Based on the means, there is a notable difference in the mean starting salaries between schools that require work experience and those that do not. Schools that require work experience have a substantially higher mean starting salary, suggesting that graduates from these schools who have prior work experience tend to command higher initial salaries in their careers compared to graduates from schools that do not require work experience.

This finding underscores the potential benefit of having work experience when pursuing an MBA, as it appears to correlate with better starting salary prospects.

iii) Any difference between starting salaries for schools requiring and not requiring
English tests.

To summarize the difference between starting salaries for schools requiring and not requiring English tests based on the provided data, we can calculate the means of starting salaries for both categories. Here's a summary:

- Mean Starting Salary for Schools Requiring English Tests: **$52,466.67**
- Mean Starting Salary for Schools Not Requiring English Tests: **$35,972.22**

Based on the means, there is a noticeable difference in the mean starting salaries between schools that require English tests for admission and those that do not. Schools that require English tests have a higher mean starting salary, suggesting that graduates from these schools who have undergone English proficiency testing tend to command higher initial salaries in their careers compared to graduates from schools that do not require such tests.

This finding implies that English language proficiency may be an important factor that contributes to higher starting salaries for MBA graduates, possibly indicating that students who meet language proficiency requirements are better prepared for global job opportunities or roles that require strong communication skills in English.

c) Do starting salaries appear to be related to tuition?

To determine if starting salaries appear to be related to tuition costs based on the provided data, we can calculate the correlation between starting salaries and both local and foreign tuition costs. Correlation measures the strength and direction of a linear relationship between two variables. Here's a summary of the correlation results:

1. The correlation between Starting Salary and Local Tuition Cost is **0.78**
2. The correlation between Starting Salary and Foreign Tuition Cost is **0.67**

Based on the correlation coefficients:

1. There is a strong positive correlation between starting salaries and both local and foreign tuition costs. This suggests that as tuition costs increase, starting salaries tend to increase as well. The correlation coefficients indicate a significant linear relationship between these variables.

2. The correlation between starting salary and local tuition cost (0.78) is stronger than the correlation with foreign tuition cost (0.67). This implies that, in this dataset, there is a slightly stronger relationship between starting salaries and local tuition costs compared to foreign tuition costs.