Client Requests

1. What is the range of the customer age in the dataset?
   Hint: Difference between the maximum and minimum age

2. Calculate the mean, median, and mode for the amount spent by customers. This will help in understanding the central tendencies of customer spending behavior.

3. Compute the variance and standard deviation for the time spent on site to analyze the variability in how much time customers spend on the website.

4. Calculate the interquartile range (IQR) for the amount spent by customers. This will help understand the spread of customer spending.
   Hint: Difference between 75th percentile (Q3) and the 25th percentile (Q1)

5. Is there any significant relationship between no.of purchases made and time spent on site? What is the correlation between the two?
   Hint: Use the correlation coefficient

6. How individual customer spending compares to the average. Calculate the z-score for a customer who spends $450. (A higher z-score indicates the customer is significantly above the average spending level, identifying them as a potential high-value customer.)
   Hint: Use the z-score formula `(z = (x-μ)/σ )`

7. Analyze the skewness of the distribution of the amount spent by customers. Is the data right-skewed or left-skewed?
   Hint: Use the skewness measure to determine if the distribution has a long tail on the right (right-skewed) or left (left-skewed).

8. What is the probability that a randomly selected customer makes more than 5 purchases in a month or spends more than $300?
   Hint: Use the addition rule

9. Determine the 95% confidence interval for the amount spent by all customers. This will provide an estimate of the range in which the true average spending is likely to fall.
   Hint: Calculate the mean and standard deviation, then use the z_critical and margin_of_error to find the confidence interval.

10. What is the probability that a customer who makes 5 or more purchases in a month will have a high cross-sell conversion rate (greater than 80%)?

Hint:

1. **Step 1:** Find the proportion of customers with a **high cross-sell conversion rate** (greater than 80%).
2. **Step 2:** Find the proportion of customers who make **5 or more purchases** in a month.
3. **Step 3:** Calculate the proportion of **high cross-sell converters** who make **5 or more purchases.**
4. **Step 4:** Use **Bayes' Theorem** to calculate the probability of high cross-sell conversion given 5 or more purchases.
