Statistics Task

1. **Question 1:** When do we need to use a Pie Chart instead of a Bar Chart, and vice versa?

   >> We prefer use a pie chart if we have a small distribution,and to show the percentages of a whole ,but we prefer use bar chart when want to compare things between different groups or needed to represent more detailed data .

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2. **Question 2:** When do we need to use a Histogram instead of a Dot Plot, and vice versa?

   >>Dot plots help organize and describe discrete quantitative small dataset, while histograms are great for showing the number of values within a specific range for large dataset .

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3. **Question 3:** If we have categorical data, which graphs should we choose?
   - ☑ ~~Bar Chart~~
   - ☐ Histogram
   - ☐ Line Chart
   - ☐ Dot Plot
   - ☐ Scatter Plot
   - ☑ ~~Pie Chart~~

4. **Question 4:** What is the definition of distribution, and what are its types?

   >>A distribution is a function that shows the possible values for a variable and how often they occur , types: Binomial, uniform, Poisson, Normal

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5. **Question 5:** What is the difference between Mean, Median, and Mode, and when should we use each of them? Discuss.

   >> Mean: The average value in a dataset.

      Median: The middle value in a dataset.

      Mode: The most frequently occurring value in a dataset.

   if we have categorical data we use only mode else use median when we have outliers else use mean.

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6. **Question 6:** What is the Regression Line? And Is it the best solution when there are many outliers in the data? Discuss.

   >> A regression line is a straight line that describes how a response variable y changes as an explanatory variable x changes.

   when we have outliers it reduces its accuracy in showing the overall trend.

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7. **Question 7:** What is the difference between Population and Sample?

   >> Population: it includes all members of a specified group.

   Sample: is a subset of the population.

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8. **MCQ** : Which of the following is true about Bayes' Theorem? (**Only One Choice True**)
   - ☐ It is used to predict the outcome of decision trees.
   - ☑ ~~It helps calculate the probability of an event based on prior knowledge of related events.~~
   - ☐ It calculates the joint probability between two random events
   - ☐ It determines the marginal probability of an event occurring