1. Bernoulli random variables take (only) the values 1 and 0.

Ans: True

2. Which of the following theorem states that the distribution of averages of iid variables, properly normalized, becomes that of a standard normal as the sample size increases?

Ans: Central Limit Theorem

3. Which of the following is incorrect with respect to use of Poisson distribution?

Ans: Modeling bounded count data

4. Point out the correct statement

Ans: All of the mentioned(The exponent of a normally distributed random variables follows what is called the log- normal distribution, Sums of normally distributed random variables are again normally distributed even if the variables are dependent, The square of a standard normal random variable follows what is called chi-squared distribution)

5. _____ random variables are used to model rates.

Ans: Poisson

6. Usually replacing the standard error by its estimated value does change the CLT.

Ans: False

7. Which of the following testing is concerned with making decisions using data?

Ans: Hypothesis

8. Normalized data are centered at_____and have units equal to standard deviations of the original data

Ans: 0

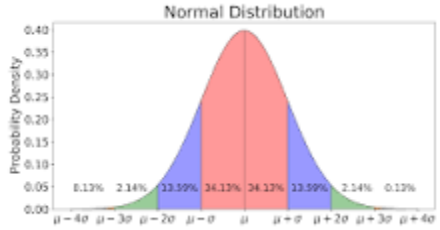
9. Which of the following statement is incorrect with respect to outliers?

Ans: Outliers cannot conform to the regression relationship

Q10and Q15 are subjective answer type questions, Answer them in your own words briefly.

10. What do you understand by the term Normal Distribution?

Ans: Normal distribution is a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graph form, normal distribution will appear as a bell curve.



In normally distributed data, there is a constant proportion of data points lying under the curve between the mean and a specific number of standard deviations from the mean. Thus, for a normal distribution, almost all values lie within 3 standard deviations of the mean.

11. How do you handle missing data? What imputation techniques do you recommend?

Ans: Missing data is a huge problem for data analysis because it distorts findings. It's difficult to be fully confident in the insights when you know that some entries are missing values. There are three types of missing data. These are Missing Completely at Random (MCAR) – when data is completely missing at random across the dataset with no discernable pattern. There is also Missing At Random (MAR) – when data is not missing randomly, but only within sub-samples of data. Finally, there is Not Missing at Random (NMAR), when there is a noticeable trend in the way data is missing. We can use deletion methods to eliminate missing data. The deletion methods only work for certain datasets where participants have missing fields or use regression analysis to systematically eliminate data like Linear Regression, KNN (K Nearest Neighbors)

12. What is A/B testing?

Ans: A/B testing, also known as split testing, refers to a randomized experimentation process wherein two or more versions of a variable (web page, page element, etc.) are shown to different segments of website visitors at the same time to determine which version leaves the maximum impact and drive business metrics. Essentially, A/B testing eliminates all the guesswork out of website optimization and enables experience optimizers to make data-backed decisions. In A/B testing, A refers to 'control' or the original testing variable. Whereas B refers to 'variation' or a new version of the original testing variable.

13. Is mean imputation of missing data acceptable practice?

Ans: Yes, imputing the mean preserves the mean of the observed data. So if the data are missing completely at random, the estimate of the mean remains unbiased. That's a good thing. Since most research studies are interested in the relationship among variables, mean imputation is not a good solution. Mean imputation (MI) is one such method in which the mean of the observed values for each variable is computed and the missing values for that variable are imputed by this mean. This method can lead into severely biased estimates even if data are MCAR. Outliers data points will have a significant impact on the mean and hence, in such cases, it is not recommended to use the mean for replacing the missing values. Using mean values for replacing missing values may not create a great model

14. What is linear regression in statistics?

Ans: Linear regression is a basic and commonly used type of predictive analysis. The overall idea of regression is to examine two things: (1) does a set of predictor variables do a good job in predicting an outcome (dependent) variable? (2) Which variables in particular are significant predictors of the outcome variable, and in what way do they– indicated by the magnitude and sign of the beta estimates–impact the outcome variable? These regression estimates are used to explain the relationship between one dependent variable and one or more independent variables. The simplest form of the regression equation with one dependent and one independent variable is defined by the formula y = c + b*x, where y = estimated dependent variable score, c = constant, b = regression coefficient, and x = score on the independent variable.

15. What are the various branches of statistics

There are 2 branches of statistics: descriptive statistics and inferential statistics.

Descriptive statistics describes the important characteristics/ properties of the data using the measures the central tendency like mean/ median/mode and the measures of dispersion like range, standard deviation, variance etc.

Inferential statistics is about using data from sample and then making inferences about the larger population from which the sample is drawn. The goal of the inferential statistics is to draw conclusions from a sample and generalize them to the population. It determines the probability of the characteristics of the sample using probability theory. The most common methodologies used are hypothesis tests, Analysis of variance etc.