BS 2nd Semester

Past Paper Stat 2021

Q # 1

i) Write any use of statistics in Computer

Ans: one Common use of Statistics in Computer Science is in Performance analysis. It helps in measuring the efficiency and effectiveness of algorithms, data structures and software systems. by collecting and analyzing data such as execution time, memory usage, and throughput to make informed desision for optimization and improvment

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ii) **Discrete** Variable:-

A discrete variable is one that take only a discrete set of integers or whole numbers, without any decimal Point/fraction.

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Number of rooms in a house, the number of deaths in an accident, the income of an individual etc.

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Continuous Variable :-

A Continuous Variable is one that takes any value fraction or integers is called Continuous Variable

e.g.

Age of Person, height of Plant, temperature at a Place, weight of a Person.

3) ~~Mean~~ - Define mean ?

It is defined as a value obtained by dividing the sum of all the observations by their number of the observations.

$$\text{Mean} = \frac{\Sigma x}{N} = \frac{\text{Sum of all the observations}}{\text{Number of observations}}$$

4) Stat multiplication law of Probability of two independent events.

Ans: The multiplication law of Probability for two independent events states that the Probability of both events happening together is equal to the Product of their individual Probabilities.

In simple terms, if events A and B are independent, the Probility of both A and B occuring is P(A) multiplied by P(B)

$$P(A \cap B) = P(A)P(B)$$

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5) When we used t-test?

Ans. A t-test is a statistical method used to compare the means of two groups to determine if there is a statistically significant difference between them.

e.g.

For example you have two groups of students. You want to know if there is a real difference between them. Like if one group is better at something than the other.

STEPS

i) Define hypothesis
ii) Collect data
iii) Do the Math
iv) Compare to a cheat sheet
v) Make a choice
vi) Explain the Result

6) Define Sampling?

Sampling is the process of selecting a smaller group or subset from a large population or collection it's like taking a small taste or portion of something to get an idea to what the whole thing is like.

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if you want to know if a bag of Candies is sweet, you don't need to eat the entire bag. You can just try a few Candies from it. It helps you make judgment or decisions about the entire group based on Smaller Part of it.

7) Define alternative hypothesis

Ans The alternative hypothesis in statistics is a statement suggesting that there is a significant difference, effect, or relationship between variables in a population against null hypothesis.

8) Define Correlation?

Ans. Correlation is a way to see if two things are related to each other. It helps us understand if changes in one thing are linked to changes in another thing, and how strong that link is.

Stat Past Papers
2022

(Question #1)

i) Define inferential statistics?

Ans Inferential statistic is a branch of statistics that involves drawing conclusions or making inferences about the population based on a sample of data.

ii) Define sample space?

Ans A set ~~of~~ consisting of all possible outcomes that can result from a random experiment is defined to be a sample space for the experiment. And it is denoted by letter S.

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iii) State the additive law of Probability of two mutually exclusive events :- ?

Ans When two events can't both happen at the same time (they are mutually exclusive), you can find the Probability of either one happening by simply adding their individual Probabilities.

e.g :-

If events A and B are mutually exclusive, the Probability of A happening OR B happening is the sum of Probabilities of A and B individually.

$P(A \text{ or } B) = P(A) + P(B)$.

iv) Why we Prefer CV over Variance ?

v) we Prefer the coefficient of Variation (CV) in Statistics beacuse it tells us the Percentage of Variation relative to the average which makes it easier to Compare data with different units and understand level of relative variability. In Contrast, variance doesn't Provide ~~that~~ this clear Percentage- based Comparison

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v) Write two advantages of sampling

1) Saves time and money :- Sampling helps you learn quickly and without spend most time and money. It's like trying a bite of food to see if you like it, rather than eating the whole meal.

2) Good for Big groups :- When there are too many things to check, sampling lets you study just a few. It's like knowing what a whole forest is like by looking at the couple of trees.

vi) Define type-1 error.

Ans A type-1 error in Statistics happen when you wrongly believe something in true when it's not true. It's like crying wolf when there's no wolf.

vii) Write the hypothesis to test the variations among the life of five laptop brands?

As. There are significant variation in the life of laptops. These differences can be build quality, ~~or~~ manufacturing Process, and overall Product design.

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viii) Define Discrete random variable:-

A random variable 'x' is defined to be discrete if it can assume values which are finite or Countably infinite

ix) Define P-value:-

A P-value is like a number that helps us understand wheather something is real or just a coincidence. If the P-value is very small, it means that what we observed is likel real and not random.

But if the p-value is loose, it suggests that what we observed is not real/could easily be due to chance

2) Write any two properties of the least squares estimator?

Ans 1) Best Fit:-

The least squares estimator is like finding the perfect line or curve that matches the data point as closely as possible.

2) Balancing errors:-

It's like a balance scale, making sure the errors above the

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line and below the line are as small as possible, so the line or curve is a good match for all the data.

xi) Write the names of tests to test the equality of two population variances and more than two population proportions :-

Ans:

i) Testing for equal spread of two groups :-

This test checks if two groups are equally consistent or if one is more all over the place than the other.

a) Test for More than Population Proportions :-
This test helps us to see if more than two groups have different Pieces of the same Pie ... like who gets ... how much ...

xii) Write two Properties of mathimatical expectation :-

Ans

i) Mathematical expectation tells us the average or ~~etc~~ expected outcome of a random event or experiment. It's like making a guess about the most likely result.

ii) The mathematical expectation follows a rule called linearity. This means if you have two or more random events, you can find the expectation of their sum by adding the expectation of each event.