

1. How are you going to figure out the average heights of all the trees in Karnataka?

Arithmetic mean using direct method formula is  $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$

2. What is hypothesis testing and how does it work?

Hypothesis testing is used to assess the plausibility of a hypothesis by using sample data. The test provides evidence concerning the plausibility of the hypothesis, given the data. Statistical analysts test a hypothesis by measuring and examining a random sample of the population being analyzed.

3. Explain the differences between Alpha and Beta errors. Which inaccuracy is the most hazardous?

#### THE NULL HYPOTHESIS AND TYPE 1 AND 2 ERRORS

When statisticians refer to Type I and Type II errors, we're talking about the two ways we can make a mistake regarding the null hypothesis ( $H_0$ ). The null hypothesis is the default position, akin to the idea of "innocent until proven guilty." We begin any hypothesis test with the assumption that the null hypothesis is correct.

We commit a Type 1 error if we reject the null hypothesis when it is true. This is a false positive, like a fire alarm that rings when there's no fire.

A Type 2 error happens if we fail to reject the null when it is not true. This is a false negative—like an alarm that fails to sound when there *is* a fire.

4. What is the significance of the p-value?

The smaller the p-value, the stronger the evidence that you should reject the null hypothesis. A p-value less than 0.05 (typically  $\leq 0.05$ ) is statistically significant. It indicates strong evidence against the null hypothesis, as there is less than a 5% probability the null is correct (and the results are random).

5. What is the Probability Distribution Function and how does it work?

The Probability Density Function(PDF) defines the probability function representing the density of a continuous random variable lying between a specific range of values. In other words, the probability density function produces the likelihood of values of the continuous random variable.