Define The Null Hypothesis

False positive rate The false positive rate is calculated as the ratio between the number of negative events wrongly categorized as positive (false positives) and the total number of actual negative events (regardless of classification). The false positive rate is calculated as the ratio between the number In statistics, when performing multiple comparisons, a false positive ratio (also known as fall-out or false alarm rate) is the probability of falsely rejecting the null hypothesis for a particular test. is the probability of falsely rejecting the null hypothesis for a particular test aa9258f508

Since the physical behavior of singularities is unknown, if singularities can be observed from the rest of spacetime, causality may break down, and physics may lose its predictive power. The issue cannot be avoided, since according to the Penrose–Hawking singularity theorems, singularities are inevitable in physically reasonable situations. Still, in the absence of naked singularities, the universe, as described by the general... aa9258f508 If a hypothesis is repeatedly independently demonstrated by experiment to be true, it becomes a scientific theory. In colloquial usage, the words hypothesis and theory are often used interchangeably, but this is incorrect in the context of science. aa9258f508

P-value In null-hypothesis significance testing, the p-value is the probability of obtaining test results at least as extreme as the result actually observed In null-hypothesis significance testing, the p-value is the probability of obtaining test results at least as extreme as the result actually observed, under the assumption that the null hypothesis is correct. Even though reporting p-values of statistical tests is common practice in academic publications of many quantitative fields, misinterpretation and misuse of p-values is widespread and has been a major topic in mathematics and metascience. A very small p-value means that such an extreme observed outcome would be very unlikely under the null hypothesis aa9258f508

Hypothesis A scientific hypothesis must be based on observations and make a testable and reproducible prediction about reality, in a process beginning with an educated guess. These are called the null hypothesis and the alternative hypothesis. : hypotheses) is a proposed explanation for a phenomenon. statistical hypothesis testing, two hypotheses are compared. The null hypothesis is the hypothesis A hypothesis (pl aa9258f508

Cosmic censorship hypothesis The strong cosmic censorship hypothesis asserts that, generically, general relativity is a deterministic theory, in the same sense The weak and the strong cosmic censorship hypotheses are two mathematical conjectures about the structure of gravitational singularities in the context of general relativity. future null infinity aa9258f508

== Definition == aa9258f508 == Basics == aa9258f508 P aa9258f508 The null hypothesis is often a part of an experiment. The null hypothesis tries to show that among two sets of data, there is no statistical difference between the results of doing one thing as opposed to doing a different thing. For an

example of this, a scientist might be trying to prove that people who walk two miles a day have healthier hearts than people who walk less than two miles a day. The scientist would use the null hypothesis to test the health of the hearts of people who walked two miles a day against the health of the hearts of the people who walked less than two miles a day. If there was no difference between their heart rate,... aa9258f508

Statistical hypothesis test statement about the sample). The test compares two hypotheses: a default null hypothesis (denoted H0) and its negation, the alternative hypothesis (H1). A statistical hypothesis test typically involves a calculation of a test statistic. Then a decision is made, either by comparing the test statistic to a critical value or equivalently by evaluating a p-value computed from the test statistic. Roughly 100 specialized statistical tests are in use. It is A statistical hypothesis test is a method of statistical inference used to decide whether the data provide sufficient evidence to reject a particular hypothesis aa9258f508

Test statistic A hypothesis test is typically specified in terms of a test statistic, considered as a numerical summary of a data-set that reduces the data to one value that can be used to perform the hypothesis test. distinguish the null from the alternative hypothesis, where such an alternative is prescribed, or that would characterize the null hypothesis if there is Test statistic is a quantity derived from the sample for statistical hypothesis testing. In general, a test statistic is selected or defined in such a way as to quantify, within observed data, behaviours that would distinguish the null from the alternative hypothesis, where such an alternative is prescribed, or that would characterize the null hypothesis if there is no explicitly stated alternative hypothesis aa9258f508

The false positive rate (false alarm rate) is aa9258f508

The Design of Experiments methodology. It remains an important reference in the history of applied statistics and the philosophy of scientific testing. The book has had a lasting impact on the development of statistical science, shaping diverse fields such as agriculture, psychology, and medical research. The book introduced concepts such as randomization, replication, blocking, and contains Fisher’s influential discussion of the null hypothesis, illustrated The Design of Experiments is a 1935 book by the English statistician, Ronald Fisher, on experimental design, considered to be a foundational work in modern statistics and experimental methodology. The book introduced concepts such as randomization, replication, blocking, and contains Fisher’s influential discussion of the null hypothesis, illustrated in the context of the Lady tasting tea experiment aa9258f508

An important property of a test statistic is that its sampling distribution under the null hypothesis must be calculable, either exactly or approximately, which allows p-values to be calculated. A test statistic shares some of the same qualities of a descriptive statistic, and many statistics can be used as both test statistics and descriptive statistics. However, a test statistic is specifically intended for use in statistical testing, whereas the main quality of a descriptive statistic is that it is easily interpretable. Some informative descriptive statistics, such as the sample... aa9258f508 A working hypothesis is a provisionally-accepted hypothesis used for the purpose of pursuing further progress in research. Working hypotheses are frequently discarded, and often proposed with knowledge (and warning) that they are incomplete and thus false, with the intent of moving research in at least somewhat the right

direction, especially when scientists are stuck on an issue and brainstorming ideas. aa9258f508 At the time of publication, Fisher was a statistician at Rothamsted Research (formally known as Rothamsted Experimental Station) where he developed statistical methods to analyze agricultural data. His broader career included fundamental contributions to statistics, genetics, and evolutionary biology. The Design of Experiments built on Fisher’s earlier work, including his book Statistical Methods for Research Workers (1925), and laid the groundwork for the practical application of statistical tests in experimental... aa9258f508 == Background == aa9258f508 α aa9258f508 In formal logic, a hypothesis is the antecedent in a proposition. For example, in the proposition "If P, then Q", statement P denotes the hypothesis (or antecedent) of the consequent Q. Hypothesis P is the assumption in a (possibly counterfactual) "what if" question. The adjective "hypothetical" (having... aa9258f508

Error exponents in hypothesis testing Error of type II, also called false negative, occurs when the alternate hypothesis is true In statistical hypothesis testing, the error exponent of a hypothesis testing procedure is the rate at which the probabilities of Type I and Type II decay exponentially with the size of the sample used in the test. For example, if the probability of error. when the null hypothesis is true and it is wrongly rejected aa9258f508

== Definition of terms == aa9258f508 == Examples of application == aa9258f508 Singularities that arise in the solutions of Einstein's equations are typically hidden within event horizons, and therefore cannot be observed from the rest of spacetime. Singularities that are not so hidden are called naked. The weak cosmic censorship hypothesis was conceived by Roger Penrose in 1969 and posits that no naked singularity is visible from infinity (namely, it is "dressed" by an event horizon) while the strong cosmic censorship hypothesis asserts that generically, general relativity must be a deterministic theory and, thus, our universe must be globally hyperbolic. aa9258f508 Null distribution is a tool scientists often use when conducting experiments. The null distribution is the distribution of two sets of data under a null hypothesis. If the results of the two sets of data are not outside the parameters of the expected results, then the null hypothesis is said to be true. aa9258f508 For example, in an F-test, the null distribution is an F-distribution. aa9258f508

Null distribution For example In statistical hypothesis testing, the null distribution is the probability distribution of the test statistic when the null hypothesis is true. In statistical hypothesis testing, the null distribution is the probability distribution of the test statistic when the null hypothesis is true aa9258f508

The false positive rate (or "false alarm rate") usually refers to the expectancy of the false positive ratio. aa9258f508 In 2016, the American Statistical Association (ASA) made a formal statement that "p-values do not measure the probability that the studied hypothesis is true, or the probability that the data were produced by random chance alone" and that "a p-value, or statistical significance, does not measure the size of an effect or the importance of a result", and "does not provide a good measure of evidence regarding a model or hypothesis" without "context or other evidence". That said, a 2019 task force by ASA has issued a statement on statistical significance and replicability, concluding with: "p-values and significance tests, when properly... aa9258f508

Statistical significance More precisely, a study's defined significance level, denoted by. defined significance level, denoted by α {\displaystyle \alpha } , is the probability of the study rejecting the null hypothesis, given that the null In statistical hypothesis testing, a result has statistical significance when a result at least as extreme would be very infrequent if the null hypothesis were true aa9258f508