

Worksheet\_set3\_statistics\_answers

1. B) Total variation = Residual Variation + Regression Variation
2. C) Collection of exchangeable binary outcomes for the same covariate data are called Binomial outcomes.
3. A) Two outcome are possible with bernoulli trial
4. A) Type - 1 error
5. A) Power of the test
6. B) Increase
7. B) Hypothesis
8. D) All of the above. Multiple testing is done so that we get to minimize statistical errors to minimize false negatives and positives.
9. A) Zero
10. Bayes theorem in simple words is something that describes the probability of an event happening based on the knowledge of all the conditions related to that particular property.

$$P(A | B) = \frac{P(B | A) \cdot P(A)}{P(B)}$$

$A, B$  = events

$P(A|B)$  = probability of A given B is true

$P(B|A)$  = probability of B given A is true

$P(A), P(B)$  = the independent probabilities of A and B

11. Z score basically tells us how much a given value differs from the standard deviation

$$Z = \frac{x - \mu}{\sigma}$$

12. T-Test a simple method to compare the mean of the two groups.

$$t_{\hat{\beta}} = \frac{\hat{\beta} - \beta_0}{\text{SE}(\hat{\beta})}$$

$t_{\hat{\beta}}$  = t-statistic

$\hat{\beta}$  = estimator of parameter

$\beta_0$  = non-random known constant

$\text{SE}(\hat{\beta})$  = standard error of the estimator

13. Percentile tells us as to how a certain score in the table is compared to all the other collective scores in the table.

14. ANOVA stands for analysis of variance and it is used to determine the difference between the means of more than two groups.

15. ANOVA is very useful because it helps us to analyze multiple groups. It makes sure that overall testing of all the groups is taking place without any issues and also tells us about the type 1 error rate.