Types of Statistical Tests

1. **Z-test**: A z-test is a statistical test used to determine whether two population means are different when the variances are known and the sample size is large. In z-test mean of the population is compared. The parameters used are population mean and population standard deviation. Z-test is used to validate a hypothesis that the sample drawn belongs to the same population.
2. **T-test**: In t-test the mean of the two given samples are compared. A t-test is used when the population parameters (mean and standard deviation) are not known.
3. **ANOVA Test**: Analysis of variance (ANOVA) is a statistical technique that is used to check if the means of two or more groups are significantly different from each other. ANOVA checks the impact of one or more factors by comparing the means of different samples. If we use a t-test instead of ANOVA test it won’t be reliable as number of samples are more than two and it will give error in the result.
4. **Chi-square test( χ2 test)**: chi-square test is used to compare two categorical variables. Calculating the Chi-Square statistic value and comparing it against a critical value from the Chi-Square distribution allows to assess whether the observed frequency are significantly different from the expected frequency.
5. **Paired T-Test**: Tests for the difference between two variables from the same population( pre- and post test score). For example- In a training program performance score of the trainee before and after completion of the program.
6. **Independent T-test**: The independent t-test which is also called the two sample t-test or student’s t-test, is a statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups. For example -comparing boys and girls in a population.
7. **One sample t-test**: The mean of a single group is compared with a given mean. For example-to check the increase and decrease in sales if the average sales is given.

t = (x1 — x2) / (σ / √n1 + σ / √n2),

where x1 and x2 are mean of sample 1 and sample 2 respectively.