Some Statistical Concepts

What is a test statistics?

- The mathematical test of the distribution you choose to use in your hypotheses testing that to determine the calculated values and critical values of your test.

What is the calculated value?

- The calculated value is the single number that proves a summery of all your observation and records.

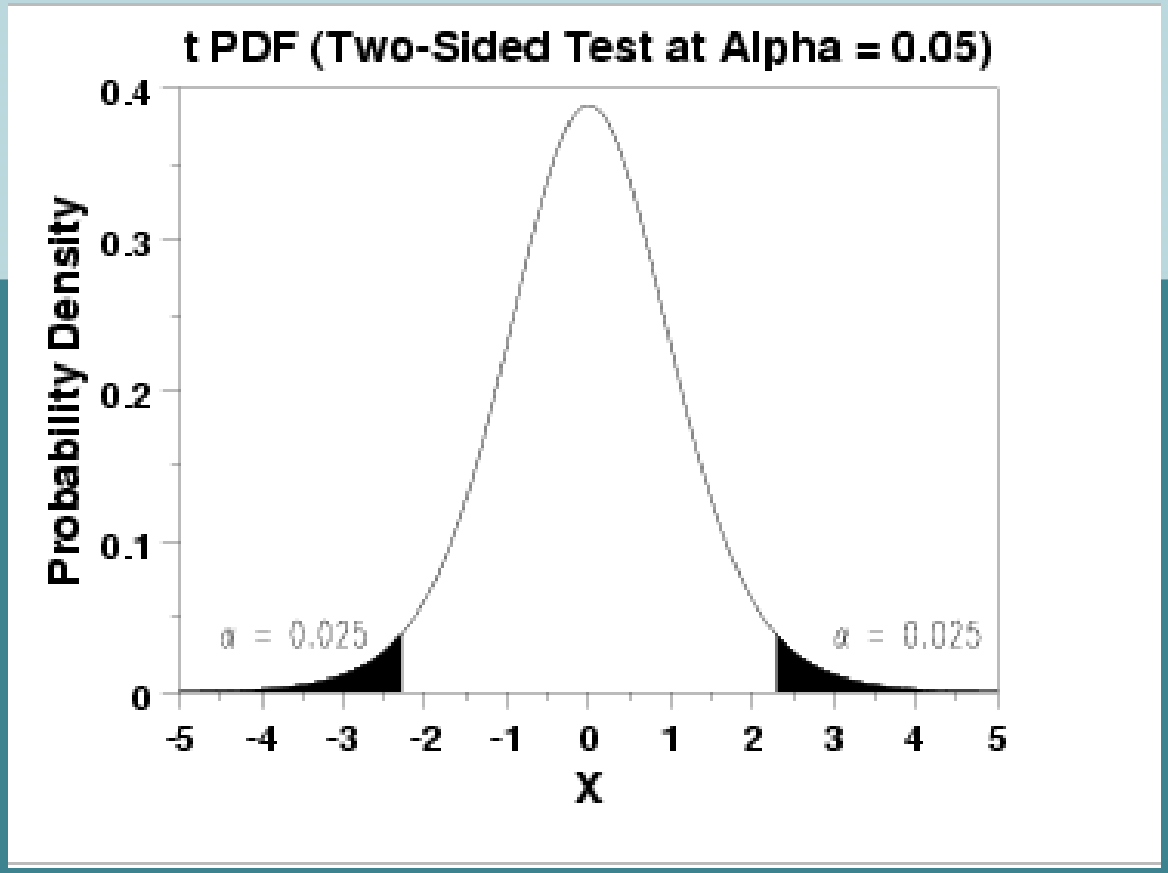
What is a critical value?

- The critical value is the tabulated value that is provided by data distribution and its already assessed for you by using the *p*-value to compare it with the calculated value:

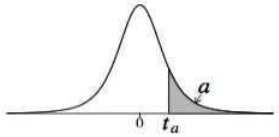
- If calculated value > critical value, in most statistical tests we reject the null hypotheses and accept the alternative one.
- If calculated value < critical value, in most statistical tests we accept the null hypotheses and reject the alternative one.
-

What is *P*-Value?

- The *P*-value is the biggest acceptable probability we base on to determine the significance of or result(s). This value is 0.05, in other words, that 95% of our data are close to the mean (mean±1).
- For normality we expect that 68% of data are close to the mean with SD=1.


t PDF (Two-Sided Test at Alpha = 0.05)
Probability Density
0.4
0.3
0.2
0.1
0
α = 0.025
α = 0.025
-5
-4
-3
-2
-1
0
1
2
3
4
5
X

A table entry is the value of t_a, having an area to the right of a under a t distribution with df degrees of freedom.



	Area to the right (a)								
df	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
1	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.3	636.6
2	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.33	31.60
3	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.21	12.92
4	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781