**Statistics for Beginners**

**Symbols for Elementary Statistics**



A lot of stats beginners are confused about stats symbols. You could misunderstand questions or select wrong formulas because of using wrong symbols. A good method to clarify various elementary stats notations is to list all of them in a summary symbol table so that you can see the difference among them right away. Especially, when we read a question, we need to be careful about whether it is **a population variable or a sample variable (see link “Population Variables vs. Sample Variables”)** because they help us to decide which formula to apply. Of course, different instructors and textbooks might use different symbols for the same variables or meaning. You could make your own symbol table for your specific stats class. Here is an example of a symbol table for PSYC 2126 at Nipissing as follows:

|  |  |  |
| --- | --- | --- |
|  | Population | Sample |
| Mean |  µ |  Μ |
| Standard Deviation  |  σ |  S |
| Variance  |  σ² |  S² |

|  |  |
| --- | --- |
| Σ | capital sigma: summation |
| Σx | sum of the values |
| Σx² | sum of the squares of the values |
| (Σx)² | square of the sum of all values |
| Σxy | sum of the products of each x value multiplied by the corresponding y value  |
| SS | sum of squares |
| p | probability of an event of the population propotion |
| q | probability of proportion equal to 1 - p |
| f | frequency |
| cf | cumulative frequency |
| C% | cumulative percentage |
| Z | Z-score, standard score |
| t | t-score, t distribution |
| Z α/2 | critical value of Z |
| t α/2 | critical value of t |
| Ho | null hypothesis |
| H1 | alternative hypothesis |
| α | alpha level/significance level: probability of a type I error or the area of the critical region |
| C.L | Confidence level, C.L= 1- α |
| β | beta: probability of a type II error |
| df | degrees of freedom |
| σM | standard error of M |
| SM | estimated standard error |
| S(M1-M2) | estimated standard error of M1 – M2 |
| SMD | estimated standard error for MD |
| Sp² | pooled variance |
| D | difference scores |
| MD | mean of sample of difference scores |
| µD | mean of a population of difference scores |
| d | Cohen’s d |
| r² | effect size |