# Exercise sheet ERM 9: t-test for independent samples

**Important concepts:**

* **Homogeneity of variance**: The variances of both samples in the t-test are approximately even (is being calculated automatically)
* **Degrees of freedom (df):** df =nsample1 + nsample2 -2

1. What are the prerequisites you need to calculate in order to perform a t-test?
2. What is the meaning of the „p-value“?
3. Which value does the level of significance (α) usually have?
4. How do you evaluate the statistical significance of a test with the following p-values?

|  |  |  |
| --- | --- | --- |
| p-value | significant | not significant |
| .516 |  |  |
| .039 |  |  |
| .076 |  |  |
| .991 |  |  |

1. Why is the t-test not suited for all experiment designs?
2. Why should you avoid to compare several groups using many t-tests?
3. Think of an experiment in the context of EduTech research, where a t-test would be suited in the analyses. Describe your experiment shortly.

**Use the data set “Beispieldatensatz\_A3 “:**

1. Using a t-test, calculate if there is a significant difference in the dependent variable *total number of remembered adjectives* (“ges”), depending on the independent variable *processing condition* “bed” („strukturell“ vs. „bildhaft“).

*t*(df=\_\_) = \_\_\_\_\_\_; *p*=\_\_\_\_\_\_

* There is a significant / no significant difference depending on processing condition.

1. Using a t-test, calculate if there is a significant difference in the dependent variable remembered negative adjectives (“negativ”), depending on the independent variable *processing condition* “bed” („emotional“ vs. „bildhaft“).

*t*(df=\_\_) = \_\_\_\_\_\_; *p*=\_\_\_\_\_\_

* There is a significant / no significant difference depending on processing condition.