

# Neuroscience Center Zurich

## University of Zurich

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### Exercises for chapter 4 (more in course)

In Class: 1

Homework; to hand in until Sunday evening 2359: 2, 3

1. Let  $\mathcal{H}_0$  be  $\mathcal{N}(0, 1)$ . We have  $n = 1$  to keep the maths easy. Choose  $\alpha = 0.05$  and test against
  - a)  $\mathcal{H}_1$  being  $\mathcal{N}(1, 1)$  and compute the  $\beta$  too.
  - b)  $\mathcal{H}_1$  being  $\mathcal{N}(2, 1)$  and compute the  $\beta$  too.
  - c)  $\mathcal{H}_1$  being  $\mathcal{N}(3, 1)$  and compute the  $\beta$  too.
  - d)  $\mathcal{H}_1$  being  $\mathcal{N}(4, 1)$  and compute the  $\beta$  too.
  - e) Summarize results from a)-d). Does it make sense?

Obviously: 1.64 and 1.96 are very important numbers for statisticians!

2. Medical treatment: You have 51 patients, measure blood pressure before treatment and after treatment. Data at hand is difference:  $x_1, \dots, x_{51}$ . Pharmaceutical company claims, blood pressure is lower with treatment than without.  $\sigma$  has been estimated to be 8.4;  $\bar{x} = -2.3$ . Make a statistical test, once with  $\alpha = 2.5 \%$ , once with  $\alpha = 5 \%$ .

3. Tablettts are weighted. We got the following weight in grams:

1.19, 1.23, 1.18, 1.21, 1.27, 1.17, 1.15, 1.14.

- a) Test, whether the average weight is 1.2 g (two-sided) at 5 %
- b) Test, whether the average weight is less than 1.2 g (one-sided) at 5 %

Give precisely the two hypothesis.

### Homework: