

# Statistical Data Analysis - Empirical study 1. part

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## 1 Research questions

Our research question is defined as follows:

Is the time spent typing on a keyboard with layout **A** equal to the time spent typing on a keyboard with layout **B**?

Layouts **A** and **B** are displayed below.

Q	F	U	M	C	K	Z
space		O	T	H	space	
B	S	R	E	A	W	X
space		I	N	D	space	
J	P	V	G	L	Y	

Figure 1: Layout **A**

Q	W	E	R	T	Y	U	I	O	P
A	S	D	F	G	H	J	K	L	
Z	X	C	V	B	N	M			
space									

Figure 2: Layout **B**

## 2 Hypotheses

Our null and the alternative hypotheses are defined as follows:

$H_0$ : The time spent typing on a keyboard with layout **A** is equal to the time spent typing on a keyboard with layout **B**.

$H_a$ : The times spent typing on keyboards with the two respective layouts are not equal.

## 3 Independent/dependent/other variables

### 3.1 Independent variables

The (binary) independent variable is the keyboard layout: **A** or **B**.

### **3.2 Dependent variables**

The dependent variable is the duration of typing:  $t$ .

### **3.3 Other variables**

Other variables I can think of could be for example: tiredness of participants, position of participants while typing (whether they were standing or sitting) or previous experience with layout **A** (because layout **B** is common). These variables were ignored and not controlled at all, except for position of participants while typing - participants were sitting.

## **4 Participants**

Population of this experiment were all computer users from which all needed to have the ability to operate keyboard on any (at least basic) level.

## **5 Counter balancing**

One half of the participants started with layout **A** and then moved on to layout **B**, the other started with layout **B** and then moved on to layout **A**.

## **6 Procedure**

Our testing procedure consisted set of of participants what were asked to type the same sentence 5 times for each keyboard layout. The sentence was “the quick brown fox jumps over the lazy dog”. Typos were ignored. The performance of each participant was measured - from the time when the participant says “start” to the time when participant says “stop” after he types the last letter.

## **7 Validity classification**

In my opinion, the experiment is not fully valid, because majority of the participants comes from the same background - we all are CS students.