INFORMATION VISUALIZATION 1

Universität Konstanz **WS'16**
Fachbereich Informatik & Informationswissenschaft
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Organize in teams of 2 people, return the exercise by Mon, Nov 14, 2016 (08:00 AM) using ILIAS (only one **pdf**-file – no screenshots from sourcecode)

A s s i g n m e n t 1

Exercise 1: Register in ILIAS & StudIS (0 points)

Registration in **StudIS** is mandatory for taking part in the final written exam!
Registration in **ILIAS** is mandatory for receiving information, e-mails etc. and submitting the exercises.

Exercise 2: Submission in groups of two persons (0 points)

Exercises must be submitted in ILIAS in groups of two persons every Monday until 08:00 am. There will be **NO** extensions!
Only one of the partners should submit the solution **BUT** please name both partners with their respective student-ID.

Exercise 3: R-Project (2 point)

For some submissions you will have to use the R-Software. Download and install the open-source software (http://www.r-project.org).

Create 10 random values in the range of 0 and 10.
HINT: *R-code: runif(#, lower, upper)*

Submission: Screenshot of your R-Console showing the 10 values.

Exercise 4: Visualization Techniques (3 points)

Name and explain briefly in your own words the three goals of visualizations. Make sure the differences between the goals are clearly described.

Submission: Text

Exercise 5: Visualization: Human vs. Computer (4 points)

Comment on the following questions:

a) Some of the best visualizations have been created without the use of computers. Does it make sense to teach „Information Visualization“ in a computer-science course?
b) On the other hand there is the possibility to use the computer to automatically extract information out of the data. Does it make sense to visualize the data/results?

Submission: Text

Exercise 6: R-Getting Started (5 point)

a) Create a vector containing values from 0 to 50 with a distance of 0.5.

HINT: *Have a look at the function seq()*

b) Calculate the square root for each of these values and add this vector to the other vector as a second column.

HINT: *Have a look at the functions sqrt() and cbind()*

c) Visualize the result with the plot() function.
d) Calculate the logarithm (base 2 and 10) for each of the values calculated in a).

HINT: *Have a look at the function log()*

e) Add the two logarithmic curves to your plot visualized in c). Use different colors for the curves.

HINT: *Have a look at the function lines()*

Submission: Code for tasks a), b), c), d) and e) Screenshots of the results c) and e)

Exercise 7: R-Vector Comparison (3 points)

a) Create the following vector vec: 2^n with $n \in N\{1,2,3,\ldots,50\}$
b) Create the following vector vec: n^2 with $n \in N\{1,2,3,\ldots,50\}$
c) Which index positions contain identical values? ($2^n == n^2$)
    a. Print the values
    b. Print the index positions
    c. Count the number of identical index positions

Submission: Code for the tasks a), b) and c). Results for each subtask of c)