Assignment 1 - Introduction and Overloading

- The problems of this assignment must be solved in C++.
- The TAs are grading solutions to the problems according to the following criteria: https://grader.eecs.jacobs-university.de/courses/320142/2018_2r2/Grading-Criteria-C++.pdf

Problem 1.1 *Install CodeLite & Write simple program* (1 point)

Presence assignment, due by 18:30 h today

Install CodeLite or some other IDE (Integrated Development Environment) suitable for C++ on your system.
Go to http://codelite.org/LiteEditor/HelloWorld and read the instructions on how to create a project.
Write a program that reads your first name from the standard input (i.e., keyboard) and prints it on the standard output (i.e., screen) using `cin` and `cout`.
You can safely assume that the input will be valid and will not contain any spaces.

Problem 1.2 *Using different variables* (1 point)

Presence assignment, due by 18:30 h today

Write a program which read one integer value into a variable `nr`, one float value into a variable `val` and a string into a variable `s` from the keyboard. Then `val` and `s` should be printed on the screen (separated by space with a newline after the string). This printing should be repeated `nr` times.
You can safely assume that the input will be valid and the string will not contain spaces.

Problem 1.3 *Sign function* (1 point)

Consider the `sign` function, which determines whether a given number is positive, negative or the number 0. The function returns the following values:

$$\texttt{sign(x)} = \begin{cases} -1 & \text{for} \quad \texttt{x} < 0, \\ 1 & \text{for} \quad \texttt{x} > 0, \\ 0 & \text{for} \quad \texttt{x} = 0. \end{cases}$$

Write a function which determines and returns the sign of an integer parameter. Then write a `main()` function which calls the function from above and prints on the screen the returned value. You may not use any library functions related to the sign.
You can safely assume that the input will be valid.

Problem 1.4 *Function overloading* (1 point)

Write a program that provides two overloaded functions named `mycount(...)`. This function either computes the difference between the first and second parameter if integers are passed or counts the number of occurrences of a character if a string and character is passed.
For example, `mycount(7, 3)` should return 4 and `mycount("this is a string", 'i')` should return 3. In case of no occurrence -1 should be returned.
Write a simple `main()` function which calls the function and demonstrates the above described behavior.
You can safely assume that the input will be valid.

Problem 1.5 *Concatenating loop* (1 point)

Write a program which reads characters one by one from the keyboard until the character `'q'` is entered. Use a loop with a `bool` variable for exiting the loop. At the end a string containing all entered characters (except spaces, tabs or newlines) should be printed on the screen (also excepting the `'q'` at the end).
You can safely assume that the input will be valid.

Problem 1.6 *A guessing game* (2 points)

Write a simple program for implementing the guessing game as outlined in the slides (Lecture 1&2, slides $50 - 51$).
You can safely assume that the input will be valid.

How to submit your solutions

- Your source code should be properly indented and compile with `g++` without any warnings (You can use `g++ -Wall -o program program.cpp`). Insert suitable comments (not on every line ...) to explain what your program does.
- Please name the programs according to the suggested filenames (they should match the description of the problem) in Grader.
  Each program **must** include a comment on the top like the following:

```
/*
   CH08-320142
   a1_p1.cpp
   Firstname Lastname
   myemail@jacobs-university.de
*/
```

- You have to submit your solutions via *Grader* at
  `https://grader.eecs.jacobs-university.de`.
  If there are problems (but **only** then) you can submit the programs by sending mail to `k.lipskoch@jacobs-university.de` **with a subject line that begins with CH08-320142**.
  It is important that you do begin your subject with the coursenumber, otherwise I might have problems to identify your submission.
- Please note, that after the deadline it will not be possible to submit any solutions. It is useless to send late solutions by mail, because they will not be accepted.

This assignment is due by Tuesday, November 20th, 10:00 h.