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Visual Computing Institute | RWTH AACHEN UNIVERSITY

Basic Techniques in Computer Graphics

Assignment 1

Date Published: October 15th 2019, Date Due: October 22th 2019

- All assignments (programming and text) have to be completed in teams of 3–4 students. Teams with fewer than 3 or more than 4 students will receive no points.
- Hand in **one solution per team per assignment**.
- Every team must work independently. Teams with identical solutions will receive no points.
- Solutions are due 14:30 on October 22th 2019. Late submissions will receive zero points. No exceptions!
- Instructions for **programming assignments**:
  - Download the solution template (a zip archive) through the Moodle course room.
  - Complete the solution.
  - Prepare a new zip archive containing your solution. It must contain exactly those files that you changed. **Only change those files you are explicitly asked to change in the task description.** The directory layout must be the same as in the archive you downloaded.
  - Upload your zip archive through Moodle before the deadline. Use the Moodle group submission feature. Only in the first week (when Moodle groups have not been created yet), list all members of your group in the file `assignmentXX/MEMBERS.txt`. Remember, only one submission per group.
  - Your solution must compile and run correctly **on our lab computers** using the exact same `Makefile` provided to you. Do not include additional libraries and do not change code outside of the specified sections. If it does not compile on our machines, you will receive no points.
- Instructions for **text assignments**:
  - Prepare your solution as a single pdf file per group. Submissions on paper will not be accepted.
  - If you write your solution by hand, write neatly! Anything we cannot decipher will receive zero points. No exceptions!
  - Add the names and student ID numbers of all team members to every pdf.
  - Unless explicitly asked otherwise, always justify your answer.
  - Be concise!
  - Submit your solution via Moodle, together with your coding submission.

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Exercise 1 Preparation [20 Points]

Make yourself familiar with the framework we are going to use for the practical assignments.

(a) Download the Archives

Go to the Moodle course room and download `libs.zip` and `assignment01.zip`. The contents of `libs.zip` will be required for the present and all future programming assignments. The contents of `assignment01.zip` are only required for the present assignment.

(b) Unpack all Files

Create a new folder on your system and unzip both files into it. Your folder now contains two sub-folders: `assignment01` and `libs`.

(c) Compile

Compile the source code and execute the resulting program as explained in the tutorial course. (On Linux or Mac, `cd` into `assignment01` and type `make`. To run the assignment enter `./assignment`.)

Though not required, we suggest that every student individually compiles and runs the application on the computer they intend to use for future programming assignments in order to get acquainted with our programming framework. (Yet, only one solution must be submitted per team.)

(d) Add Debug Output

In the file `assignment.cpp`, inside the function `drawScene(...)` print the current scene id and time to `std::cout`.

(e) Specify Group Members

In this course, we will use the Moodle group submission feature. However, we have to initially create those groups for you. For this reason, fill out the file `MEMBERS.txt` and include all student ids and names of your group. This step is necessary only once in this first assignment. Afterwards, you can manage your group directly in Moodle. Please remember, that only submissions groups of 3-4 students are allowed. In case your group looses members, please regroup! Leaving and joining groups will be possible in Moodle after the first assignment.

(f) Submit Your Solution

Follow the general instructions for programming assignments laid out on the previous page and also explained in the tutorial course. This includes correctly submitting your solution through Moodle. Since you changed code inside the file `assignment.cpp` your solution zip archive will contain exactly two files: `assignment01/MEMBERS.txt` and `assignment01/assignment.cpp`. Only one group members has to submit!

Note: The test program demonstrates that you can compile a simple OpenGL program with the C++ development environment of you choice. It also gives you information about your computer's graphics card and drivers.

For the rare case that your system does not meet the requirements to run our programming assignments (i.e. your GPU does not support OpenGL 3.2 or higher), we prepared a virtual machine for you as a fallback. Please only use the machine as a last resort, since it has very limited performance! (OpenGL will be emulated in software.) You can download the machine from the course website `https://www.graphics.rwth-aachen.de/course/173/`.

If even that fails, you can get an account for our lab computers. **If you need an account for our lab, request it as early as possible!**