

# CS380

## Programming Assignment #3

**Objective:** Understand how to perform transformations in terms of viewing space.

**Provided materials:** Two header files(.h), two source files(.cpp), two modeling files(.obj), one sample binary(.exe)

**Procedure:**

- 1) Implement this assignment from the result of PA#2.
- 2) Provide two key maps, “m” and “v” to differential transformations defined in the modeling space and viewing space.
  - a. All the transformations implemented in PA#2 are now performed after you type “m”.
  - b. If you type “v”, all the transformations (, which will be described in 3) and 4) in this spec.) are performed in the \* viewing space \*.
- 3) Provide translation function along x, y, z directions in the viewing space.
  - a. The amount of translations is determined by the mouse movement.
  - b. If you type “x” or “y”, the cow model translates in the \* viewing x-y space \*; the cow should follow the mouse cursor pointer.
  - c. If you type “z”, then the cow model translates along the z-direction in the \* viewing space \*.
- 4) Rotate the cow around the x-axis in the viewing space when you type “r”. The center of the rotation is at the center of the modeling space.
  - a. The rotation amount is computed based on the mouse movement.

**Deliveries:**

- 1) Binary (\*.exe) and source codes (SimpleScene.cpp) of your solutions.
- 2) A report (\*.pdf) that specifies the files you made/changed.  
(The report should contain the following 3 images.)
  - a. Attach two images of cow translation in the viewing x-y, z space, respectively.
  - b. Attach one image of rotating cow around the x-axis in the viewing space.

**Scoring criteria (30 pts):**

- 1) Mode change (“m”: modeling space, “v”: viewing space) (2 pts)
- 2) Translation
  - a) cow translation in the viewing x-y, z space (9 pts)
  - b) toggle “x”, “y”, or “z” (5 pts)
- 3) Rotation
  - a) cow rotation around the x-axis in viewing space (9 pts)
  - b) toggle key “r” (5 pts)

- ❖ Compile error will get 0 point.
- ❖ Implementation outside of implementing area is not allowed.
- ❖ Use variables presented in “(Project 2, 3) Variables”.
- ❖ There are two areas for implementation. Please search “(Project 2, 3)”.

**Policies:**

1. Do not edit any other files than “SimpleScene.cpp”.