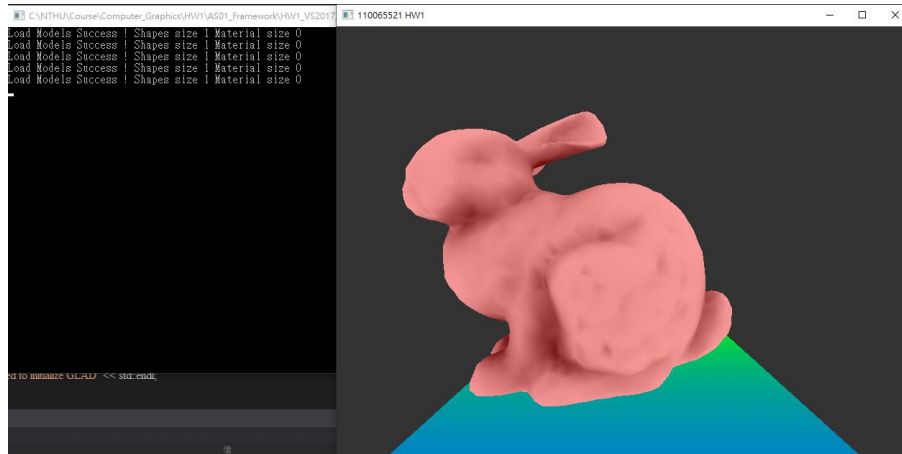


Introduction to Computer Graphics

Assignment 1 -Transformation

1. The Result of the Program



Key Mapping

- ◆ Please follow the spec bellow, or you would not get the score of item.
- ◆ You **must** make sure your key mapping is **exactly same** to ours.
- ◆ W: switch between solid and wireframe mode
- ◆ Z/X: switch the model
- ◆ O: switch to Orthogonal projection
- ◆ P: switch to NDC Perspective projection
- ◆ T: switch to translation mode
- ◆ S: switch to scale mode
- ◆ R: switch to rotation mode

Key Mapping

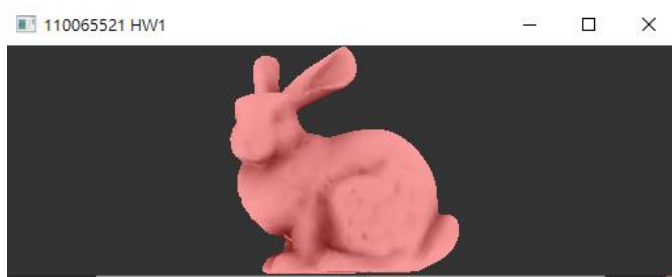
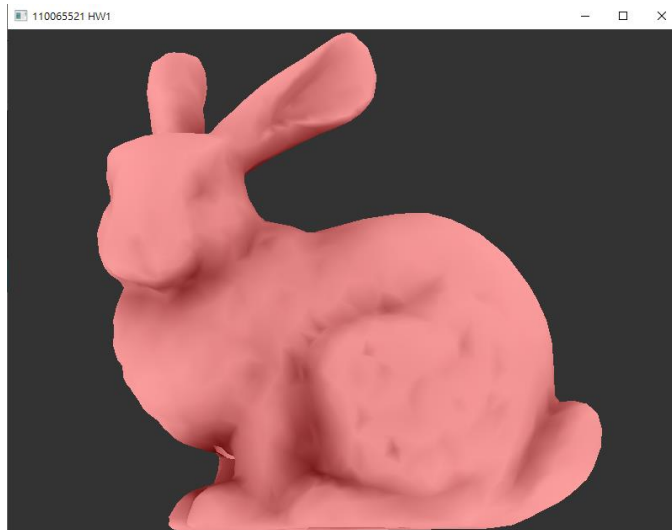
- ◆ E: switch to translate eye position mode
- ◆ C: switch to translate viewing center position mode
- ◆ U: switch to translate camera up vector position mode
- ◆ I: print information
 - ◆ Translation Matrix, Rotation Matrix, Scaling Matrix, Viewing Matrix, Projection Matrix

Key Mapping

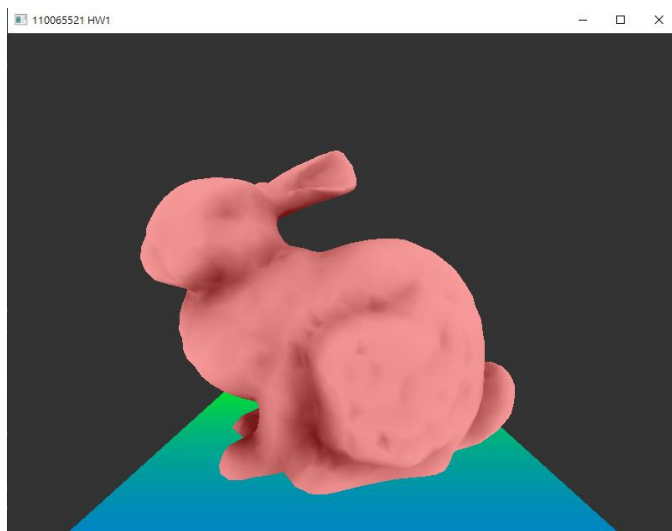
- ◆ If you switch mode by T, S, R, E, C, and U
- ◆ Apply change on **Z** axis when scroll the wheel
- ◆ Apply change on **X** axis when mouse **drag horizontally**
- ◆ Apply change on **Y** axis when mouse **drag vertically**
- ◆ Only rotation should apply X axis when mouse drag vertically, and Y axis when mouse drag horizontally

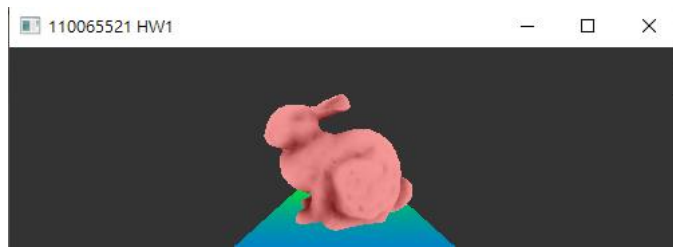
2. Results

- Correctly render model in Orthogonal projection (10%)
To switch to this orthogonal projection, we can press 'O' button, to prevent stretching, I set the width become the aspect ratio.



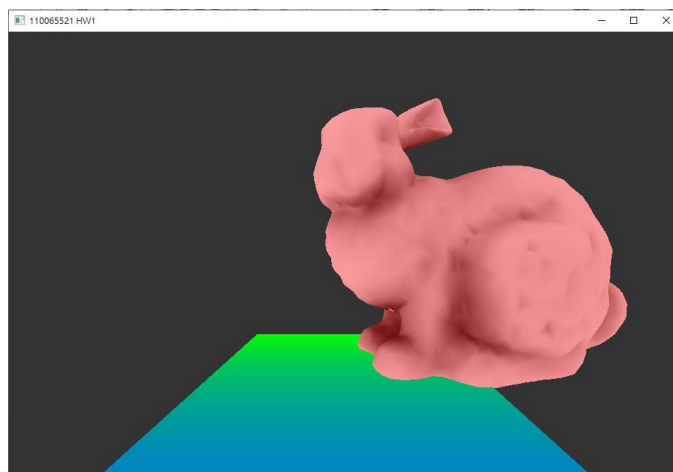
- Correctly render model in NDC perspective (10%)
To switch to this perspective projection, we can press 'P' button, to prevent stretching, I always update the projection aspect ratio variable.



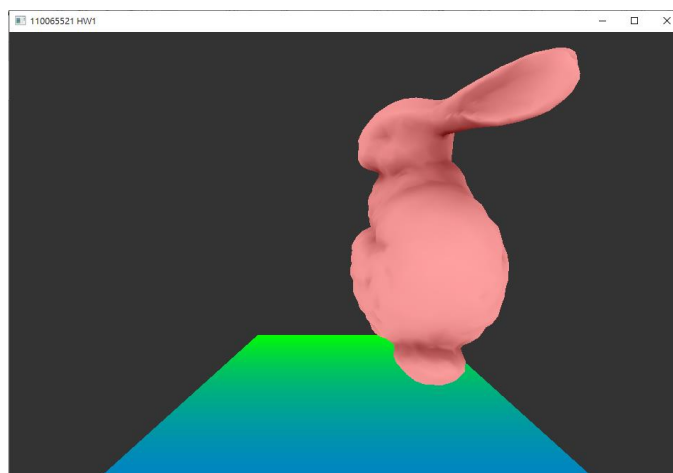


- Translation, Rotation, Scaling models (30%)

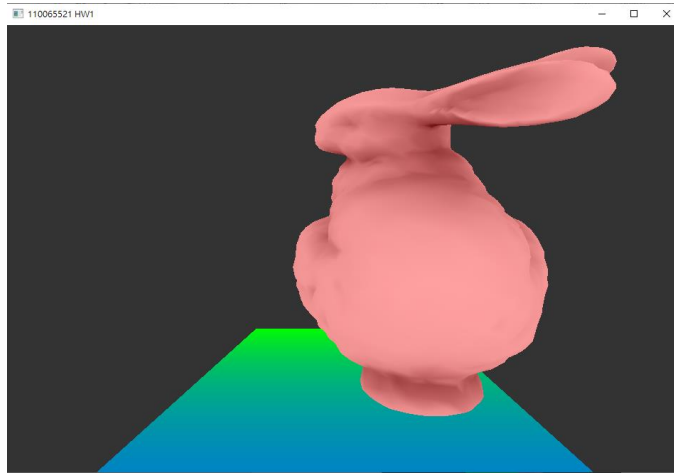
To perform translation, we can press “T” and then click, hold, and drag the model to move it.



To perform rotation, we can press “R” and then click, hold, and drag the model to rotate it.

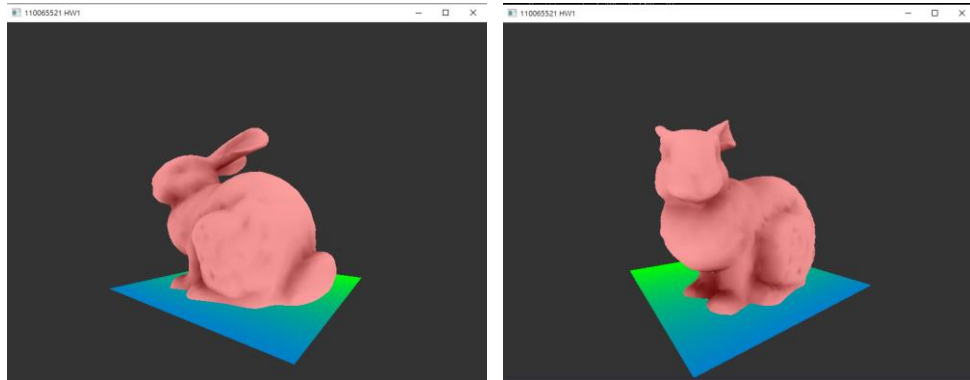


To perform scaling, we can press “S” and then click, hold, and drag the model to scale it.

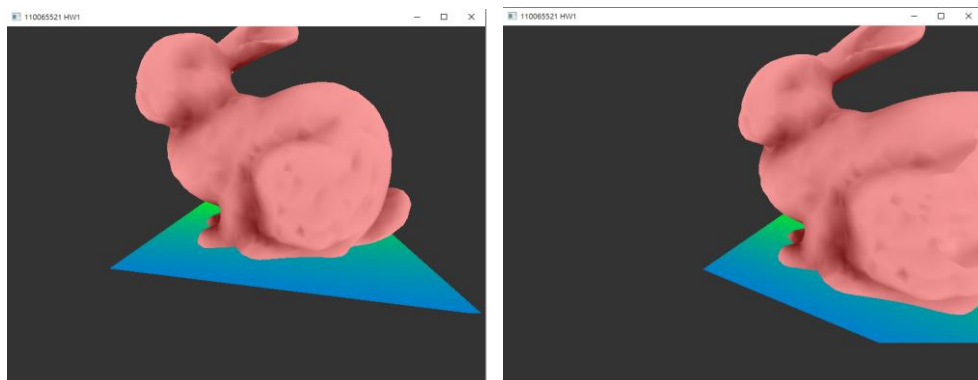


- **Camera Control (30%)**

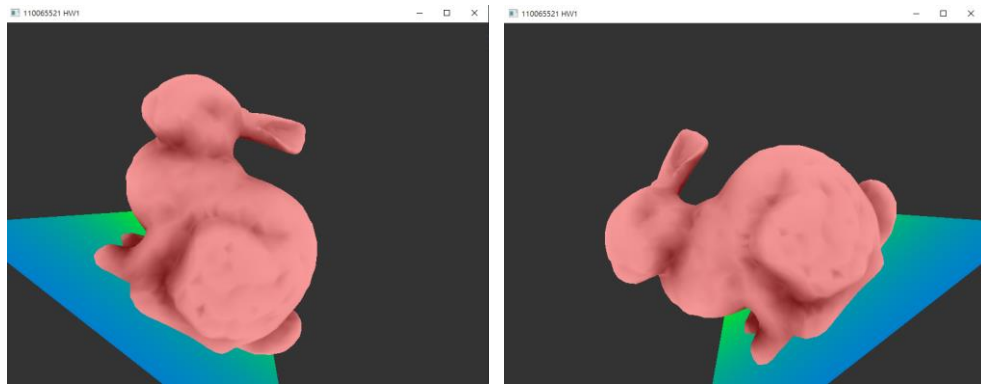
Press “E” to switch to translate eye position mode and then click, hold, and drag the model to move it.



Press “C” to switch to translate viewing center position mode and then click, hold, and drag the model to move it.

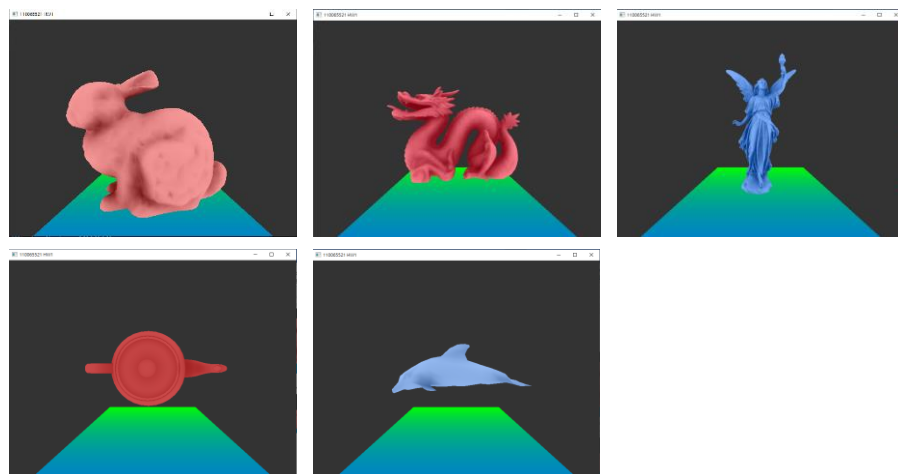


Press “U” to switch to translate camera up position mode and then click, hold, and drag the model to move it.

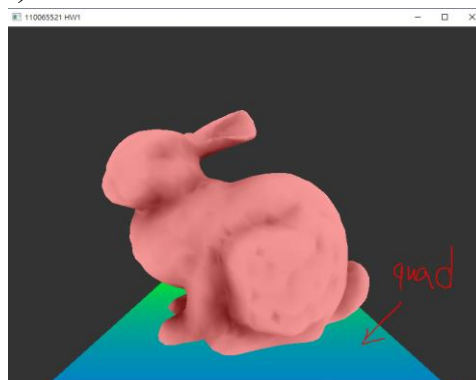


- Switch Models (5%)

To switch model, we can press Z/X

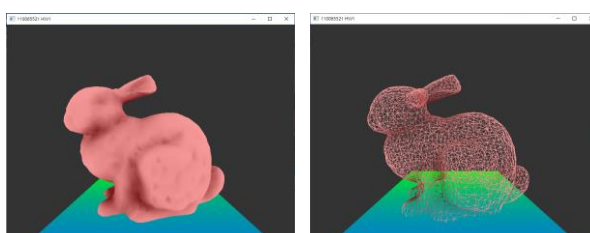


- Render quad (5%)



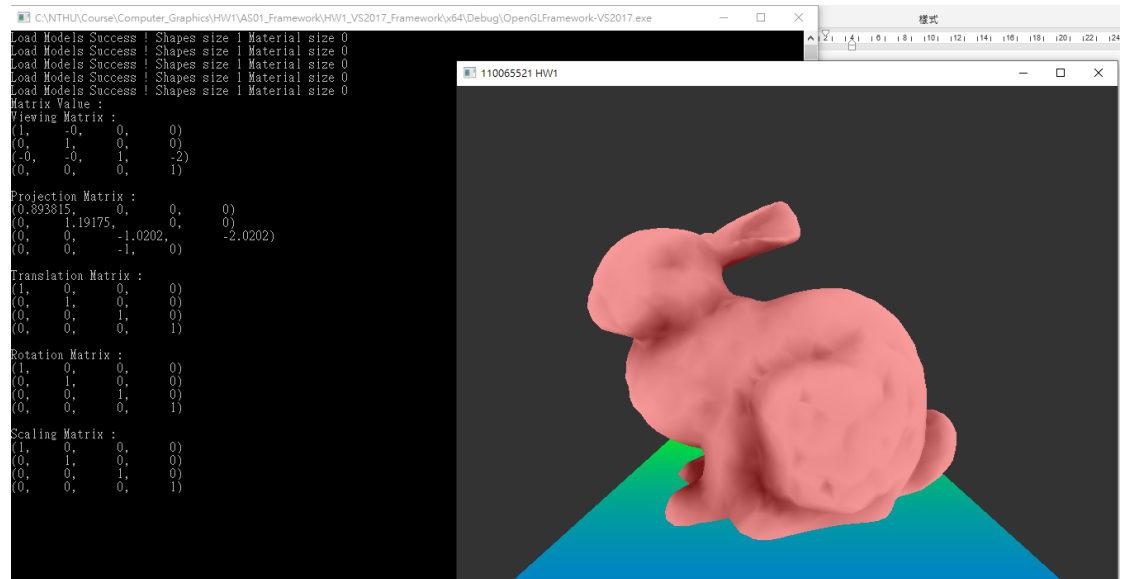
- Switch between solid and wireframe mode (5%)

Press "W" to switch between wireframe and solid mode.

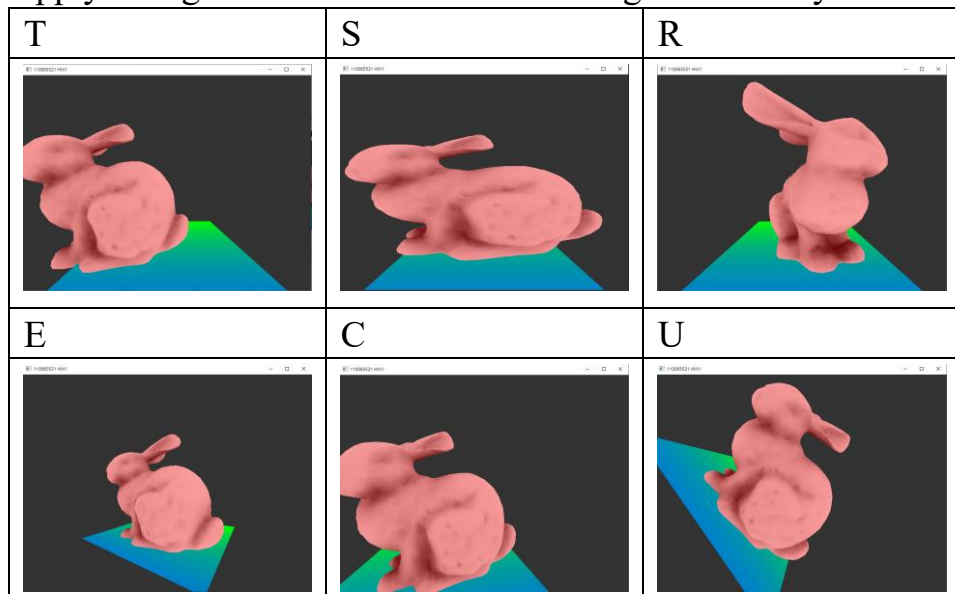


- Print information (5%)

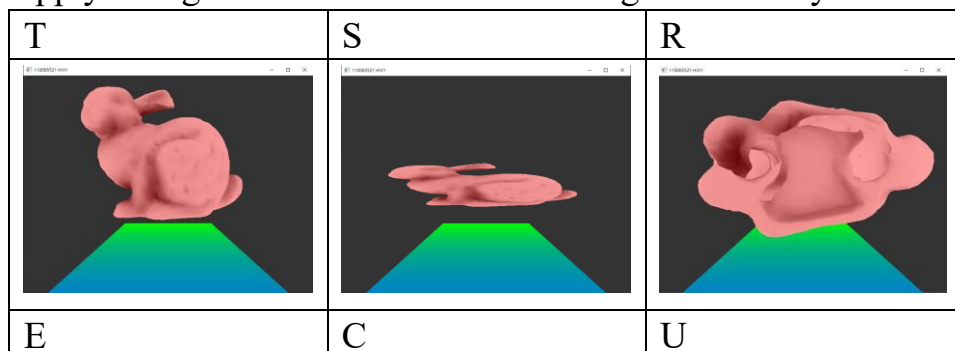
Press “I” button to print out the matrices information.

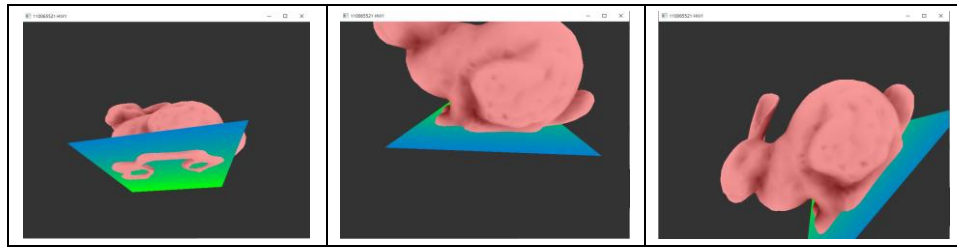


- Apply change on X axis when mouse drag horizontally



- Apply change on Y axis when mouse drag horizontally





- Apply change on Z axis when mouse drag horizontally

