

Computer Graphics HW1 Report

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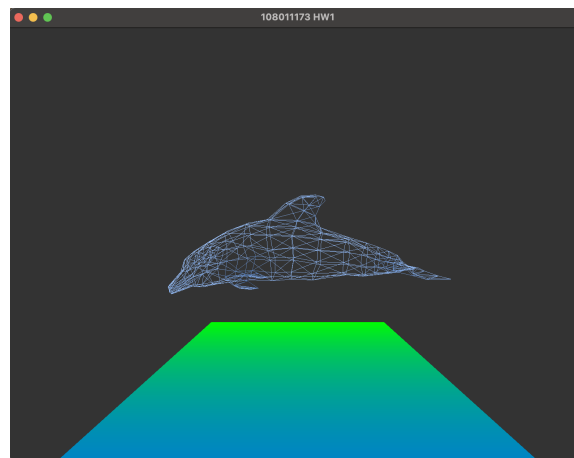
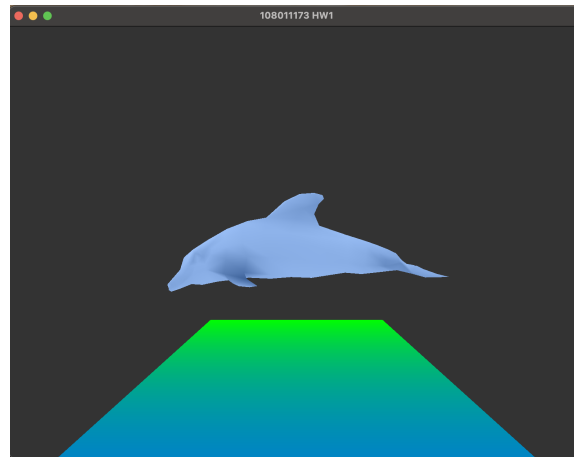
Control Instructions

1. **W**: switch between solid mode & wireframe mode

- Description :

Press “ W ” to switch between solid mode & wireframe mode.

- Screenshot :

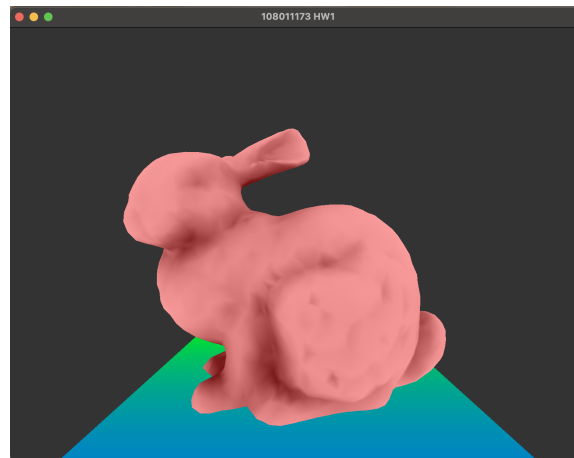
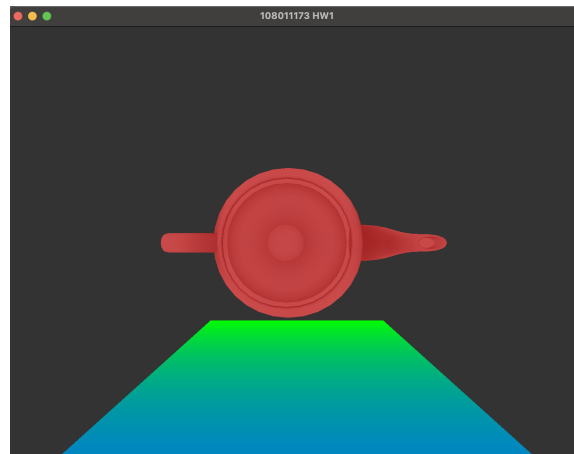


2. **Z / X** : switch to the previous or the next image

- Description :

Press “ X ” to the next image, and press “ Z ” to the previous one.

- Screenshot:

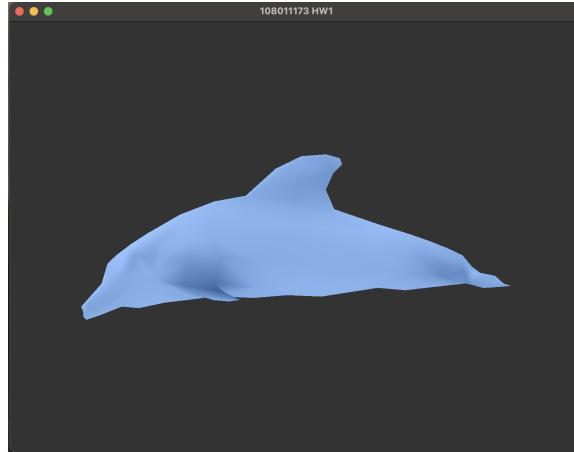


3. **O** : switch to an orthogonal projection

- Description :

Press “ O ” to switch to an orthogonal projection.

- Screenshot :

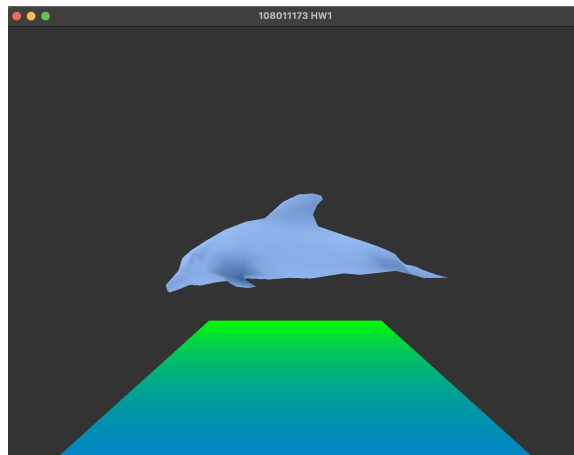


4. **P** : switch to an perspective projection

- Description :

Press “ P ” to switch to an perspective projection.

- Screenshot :



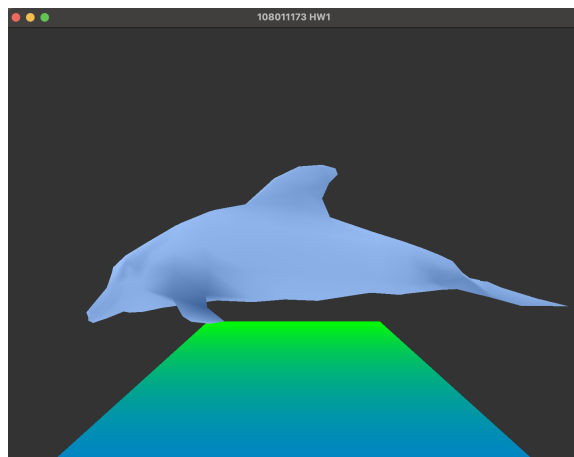
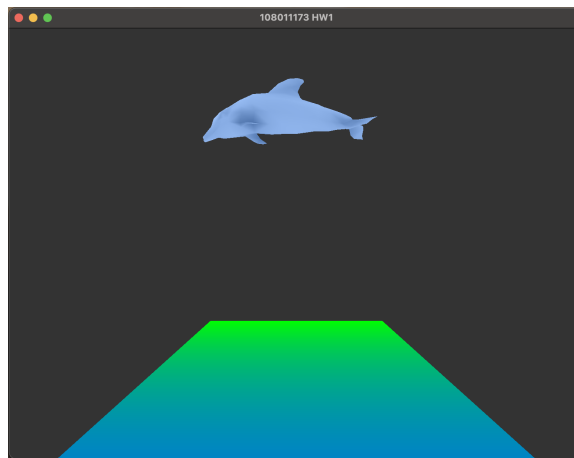
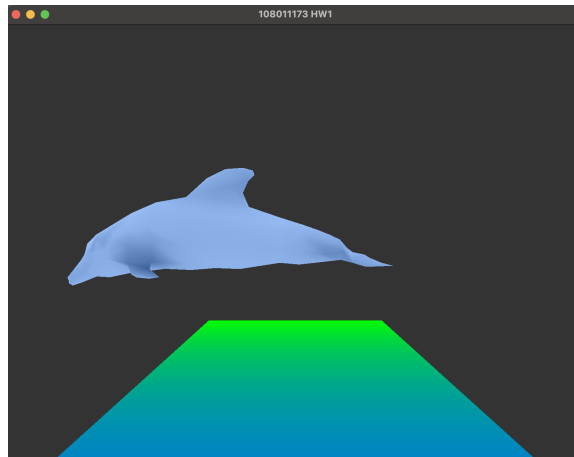
5. **T** : switch to translation mode

- Description :

Press “ T ” to switch to translation mode.

- Press the left bottom of the mouse and drag it, and we can do the translation along x & y axis respectively.
- Scroll the mouse wheel, and we can do the translation along the z-axis.

- Screenshot :



6. **S** : switch to scale mode

- Description :

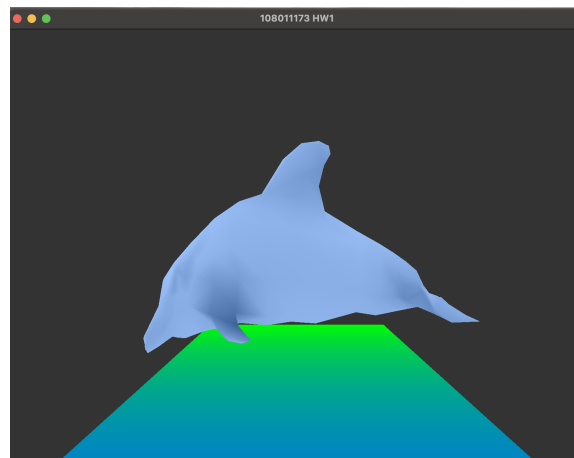
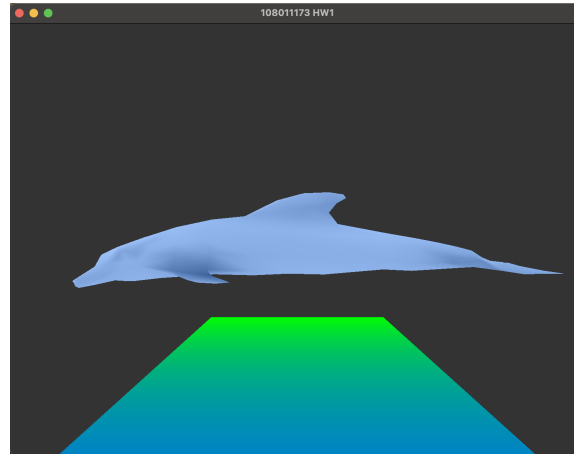
Press "S" to switch to scale mode

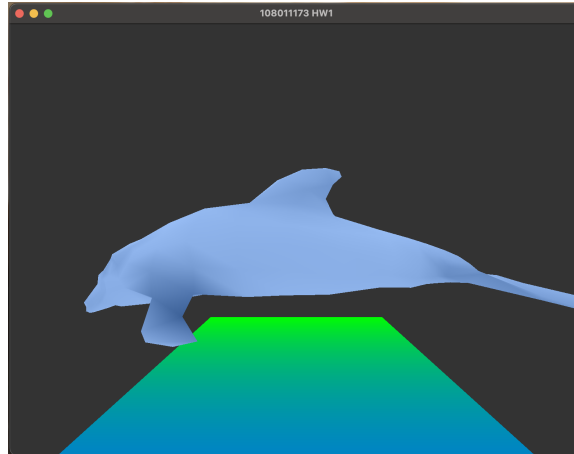
- Press the left bottom of the mouse and drag it, and we can do the scaling along the x & y axis respectively.

(For x: left drag → Amplify along x ; For y: down drag → Shrink along y)

- Scroll the mouse wheel, and we can do the scaling along the z-axis.

- Screenshot :





7. **R** : switch to rotation mode

- Description :

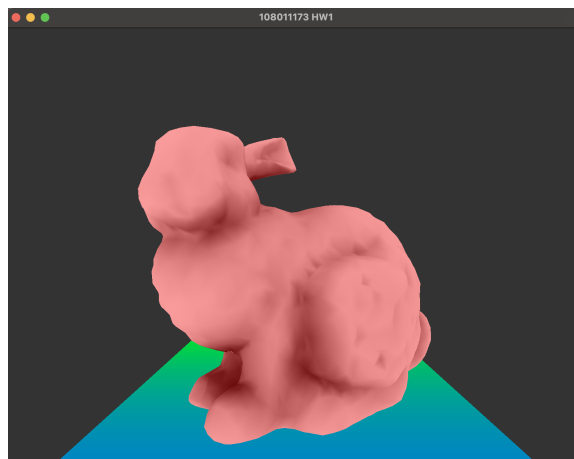
Press "R" to switch to rotation mode

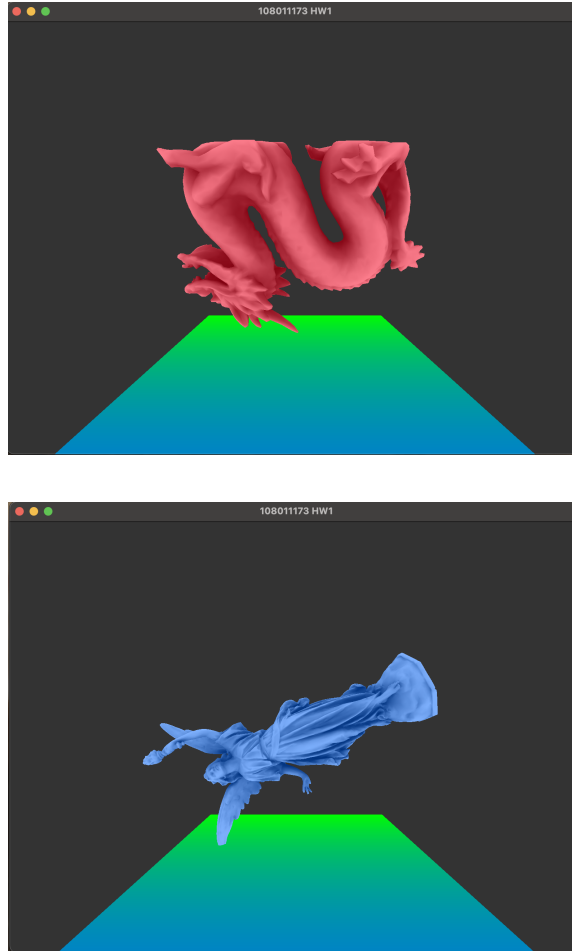
- Press the left bottom of the mouse and drag it, and we can do the rotation along the x & y axis respectively.

(For x: left drag → Rotate along x ; For y: down drag → Rotate along y)

- Scroll the mouse wheel, and we can do the rotation along the z-axis.

- Screenshot :





Camera Control

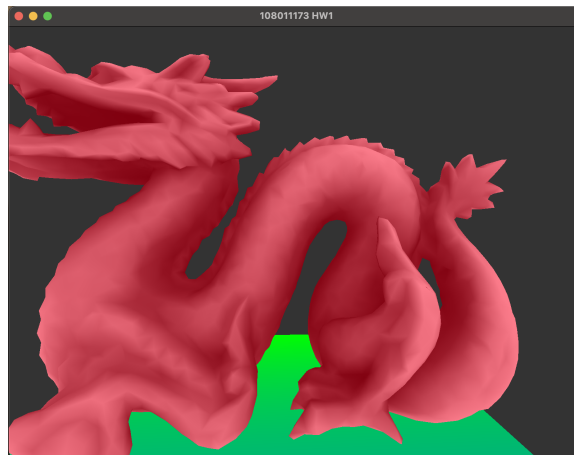
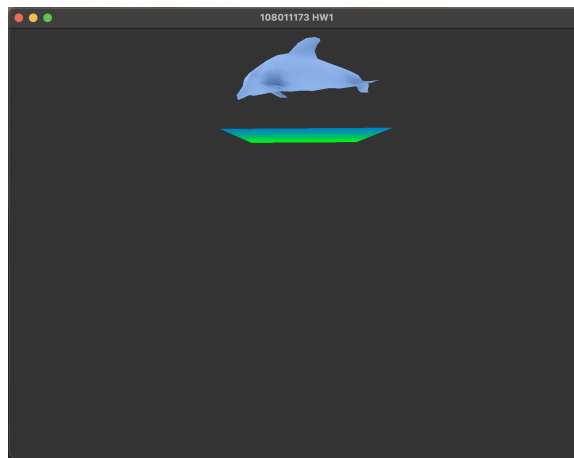
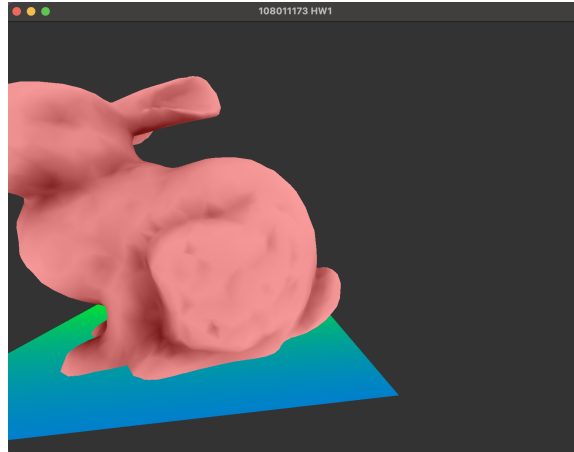
1. **E** : switch to translate eye position mode

- Description :

Press "E" to switch to translate eye position mode

- Press the left bottom of the mouse and drag it, and we can change the eye position of the x & y axis respectively.
- Scroll the mouse wheel, and we can change the eye position of the z-axis.

- Screenshot :

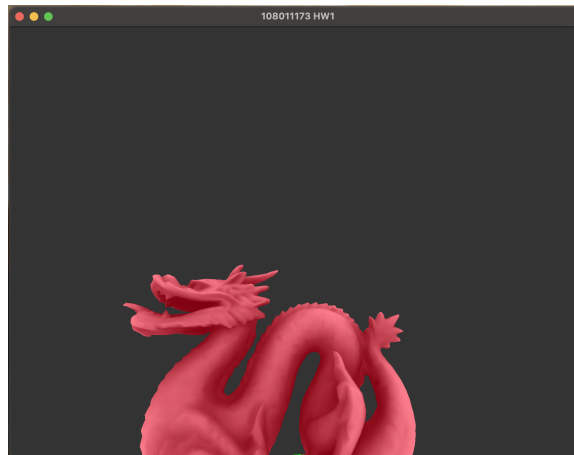
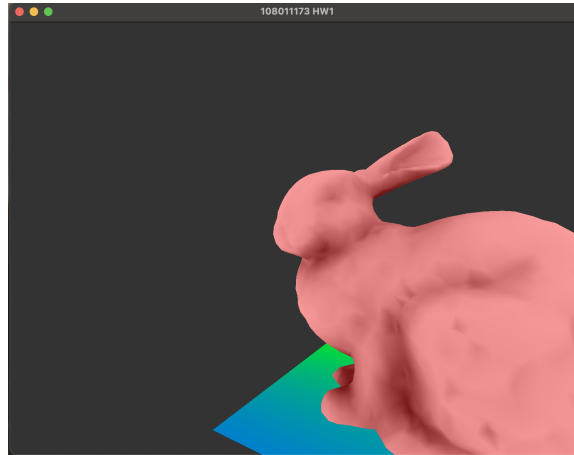


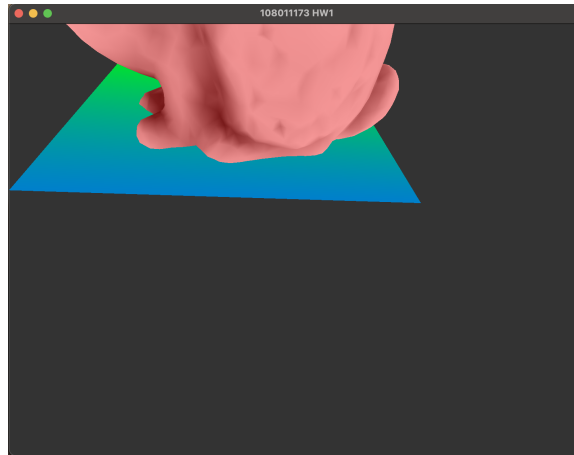
2. **C** : switch to translate viewing center position mode

- Description :

Press "C" to switch to translate the viewing center position mode

- Press the left bottom of the mouse and drag it, and we can change the viewing center position of the x & y axis respectively.
- Scroll the mouse wheel, and we can change the viewing center position of the z-axis.
- Screenshot :





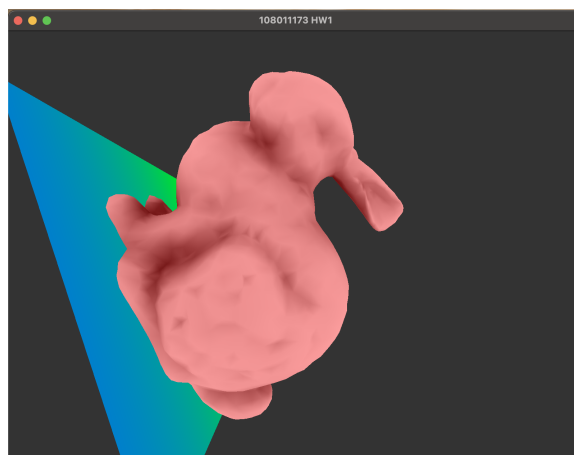
3. **U** : switch to translate camera up vector position mode

- Description :

Press “U” to switch to translate the camera up vector position mode

- Press the left bottom of the mouse and drag it, and we can change the camera up vector position of the x & y axis respectively.
- Scroll the mouse wheel, and we can change the camera up vector position of the z-axis.

- Screenshot :



Print Information

1. **I** : print out the information of the matrix

- Translation Matrix, Rotation Matrix, Scaling Matrix, Viewing Matrix, Projection Matrix

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Matrix Value:
Viewing Matrix:
(0.999712, -0.024, 0, 0)
(0.024, 0.999712, 0, 0)
(0, 0, 1, -2)
(0, 0, 0, 1)

Projection Matrix:
(0.893815, 0, 0, 0)
(0, 1.19175, 0, 0)
(0, 0, -1.00002, -0.00200002)
(0, 0, -1, 0)

Translation Matrix:
(1, 0, 0, 0)
(0, 1, 0, 0)
(0, 0, 1, 0)
(0, 0, 0, 1)

Rotation Matrix:
(1, 0, 0, 0)
(0, 1, 0, 0)
(0, 0, 1, 0)
(0, 0, 0, 1)

Scaling Matrix:
(1, 0, 0, 0)
(0, 1, 0, 0)
(0, 0, 1, 0)
(0, 0, 0, 1)

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Bonus for Window Resize

- If we adjust or resize the window size, the distortion won't happen for the object.

