

Computer Graphics HW3 Report

Texture Mapping

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Control Instructions

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

- Description :

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

- Screenshot:



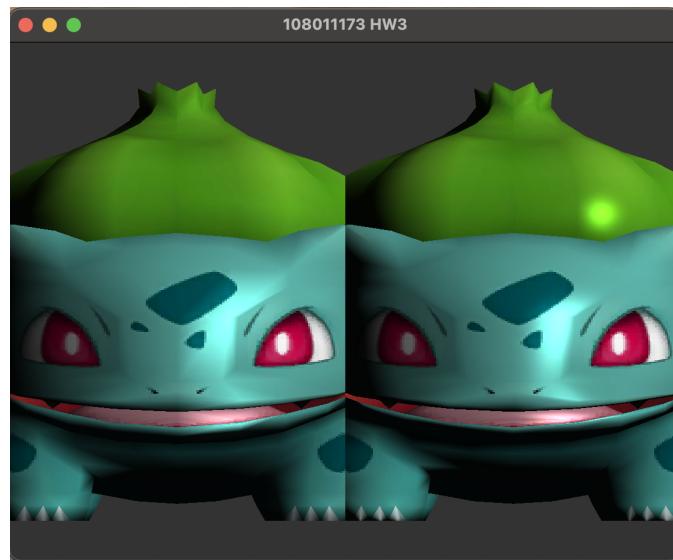


2. O / P: switch to the orthogonal mode or projection mode

- Description :

Press “ O “ to switch to the orthogonal mode and press “ P “ to switch to projection mode

- Screenshot :





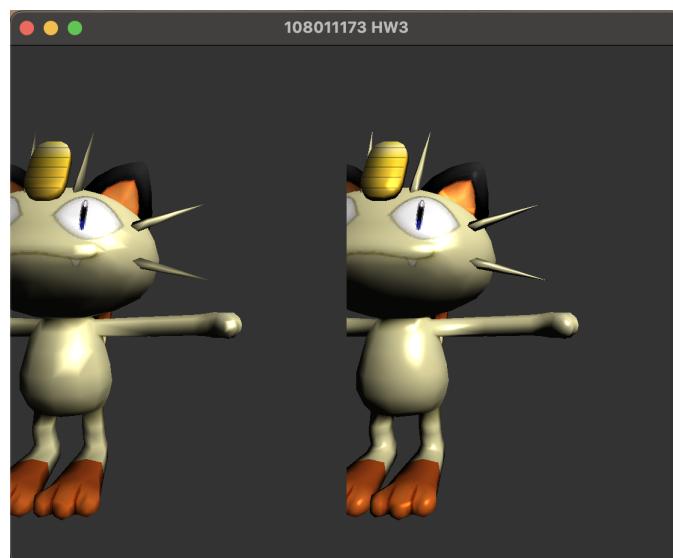
3. T : switch to translation mode

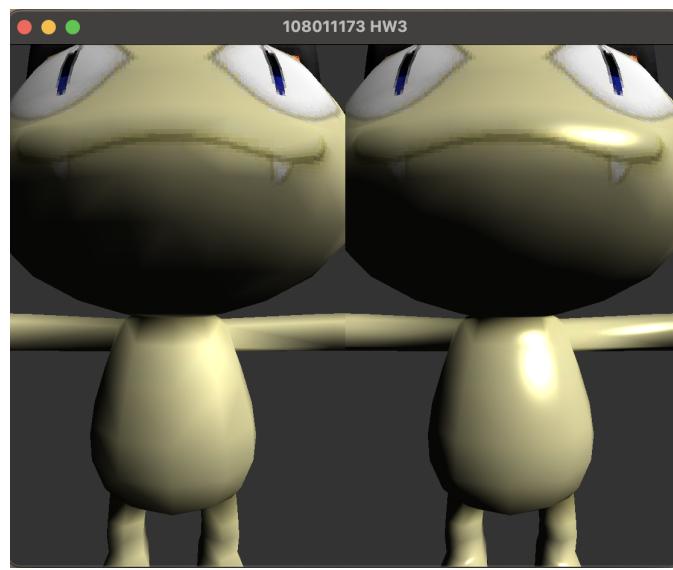
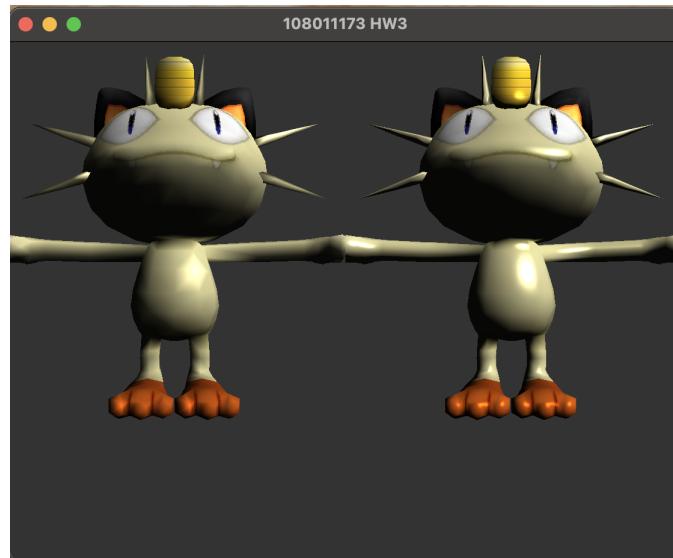
- Description :

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.

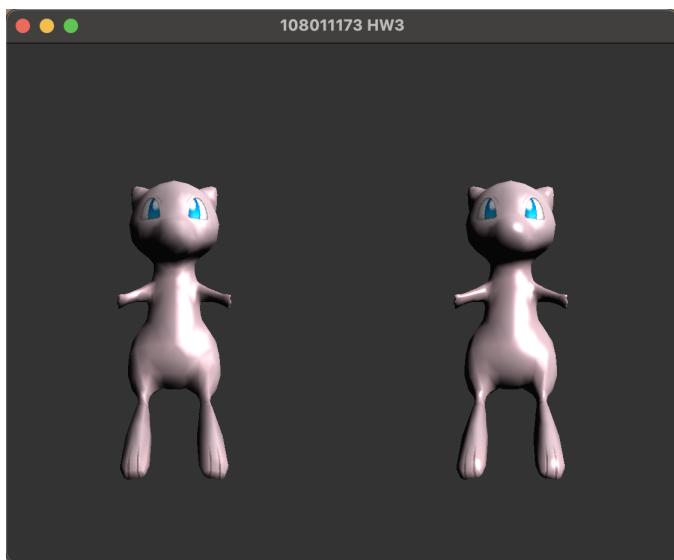
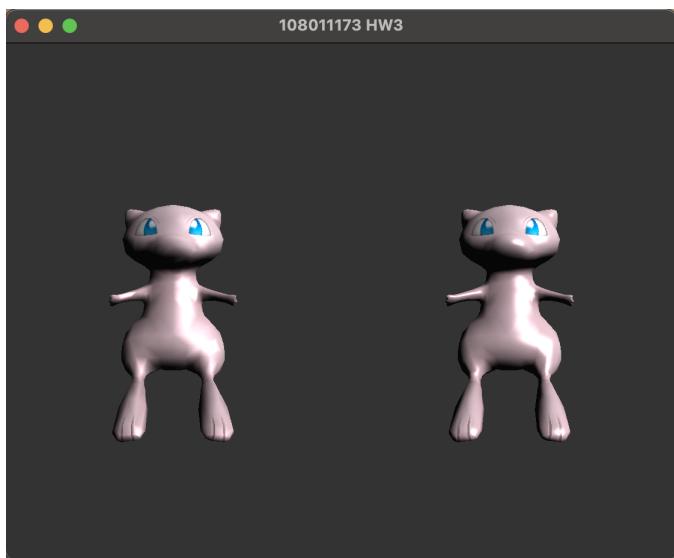
- Screenshot :





4. **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 → Shrink along x ; For y: down drag → Shrink along y)
 - Scroll the mouse wheel, and we can do the scaling along the z-axis.
- Screenshot :





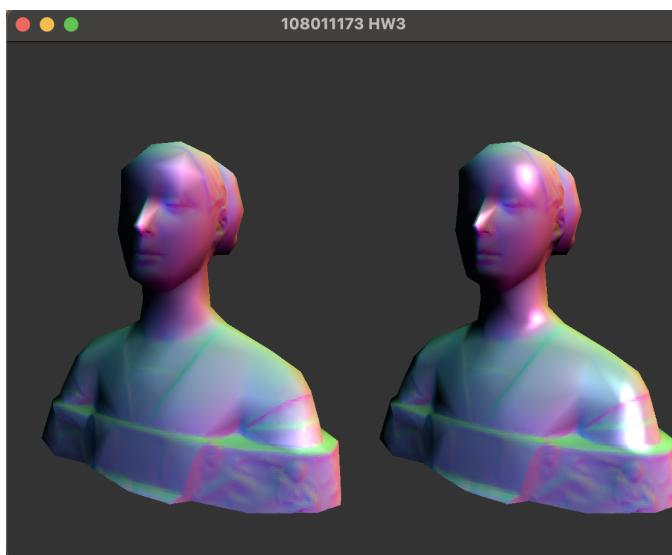
5. **R** : switch to rotation mode

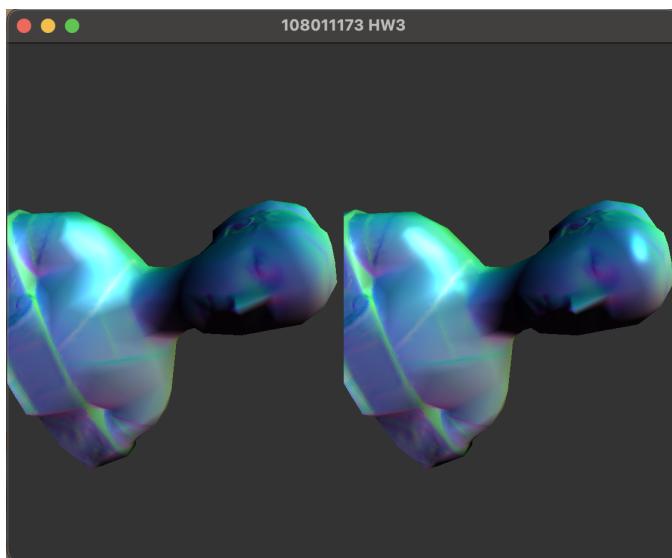
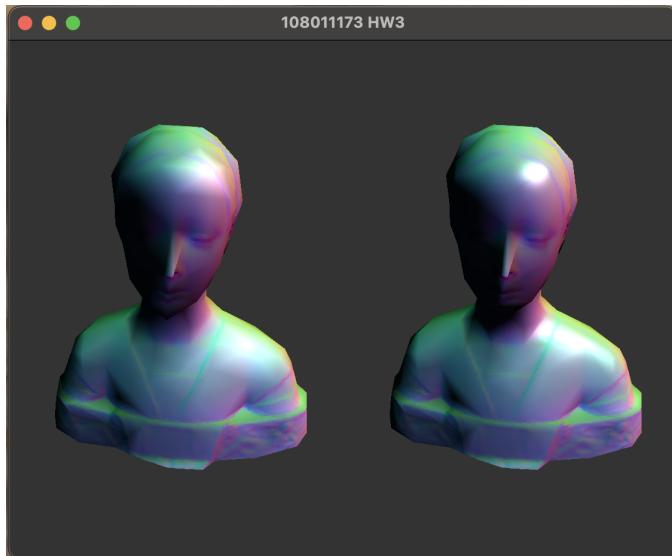
- Description :

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 :





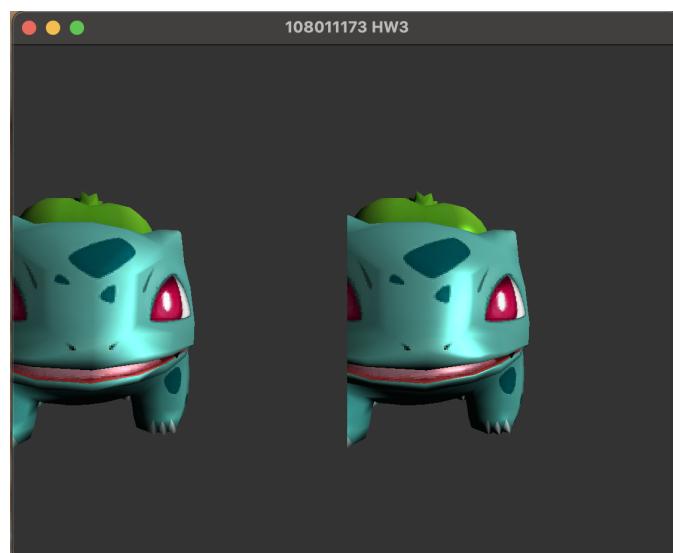
2. C : switch to translate viewing center position mode

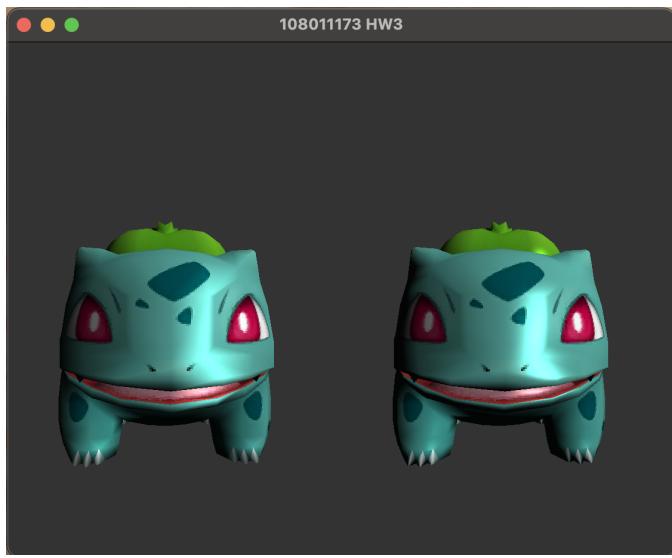
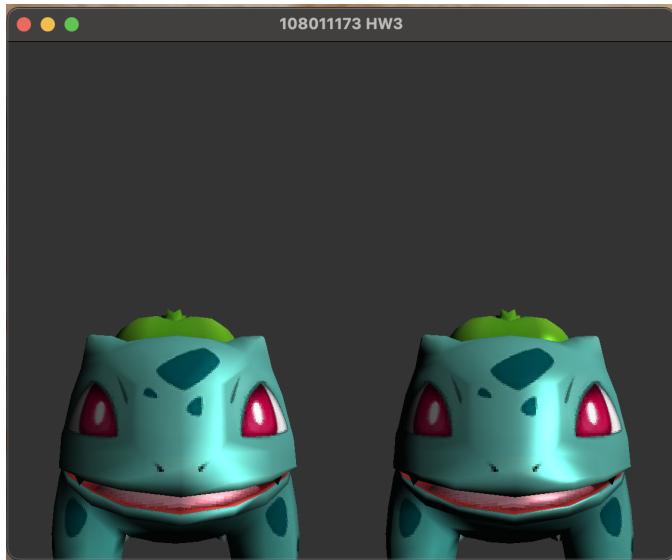
- Description :

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 :





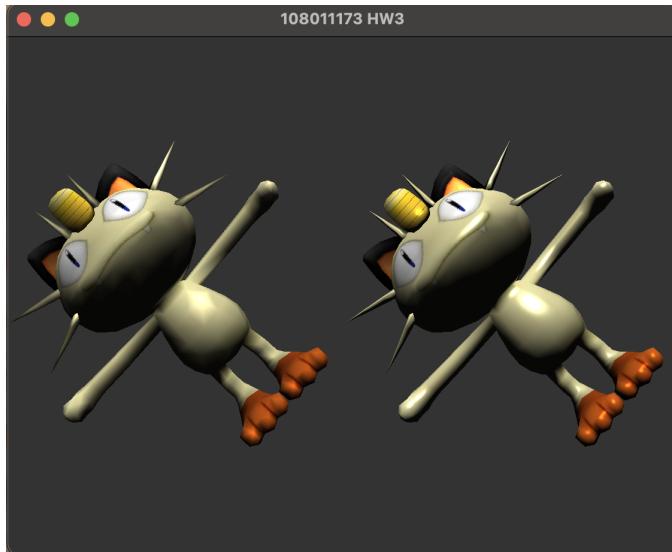
3. **U** : switch to translate camera up vector position mode

- 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
 - Screenshots :

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Matrix Value:
Viewing Matrix:
(0.999439,  0.010095,   0.0319364, -0.0250569)
(-0.013407, 0.994355,   0.105254,   0.0470271)
(-0.0306936, -0.105623, 0.993932, -2.13964)
(0, 0, 0, 1)

Projection Matrix:
(1.84296, 0, 0, 0)
(0, 1.19175, 0, 0)
(0, 0, -1.00002, -0.00200002)
(0, 0, -1, 0)

Translation Matrix:
(1, 0, 0, -0.0100003)
(0, 1, 0, 0.0675)
(0, 0, 1, -0.0699986)
(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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Lighting

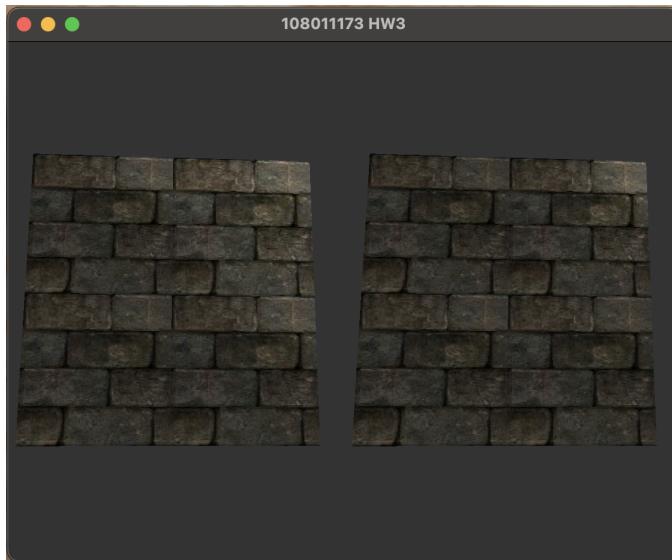
1. L : switch between directional light, point light, and spotlight

- Description :

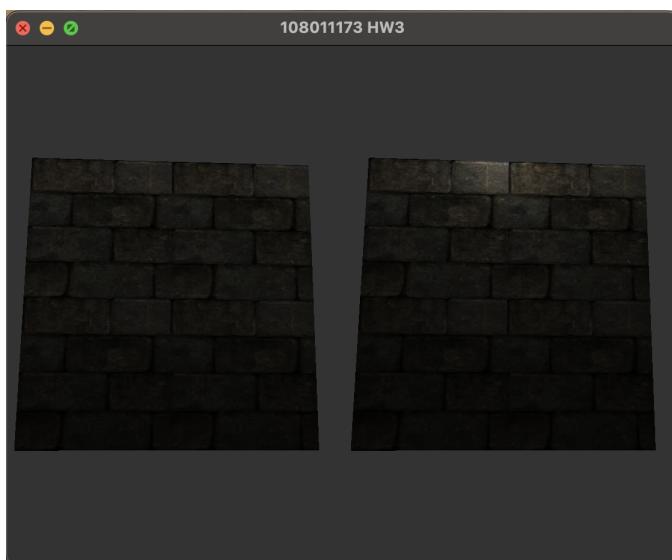
Press “L” to switch between different light sources

- Screenshots :

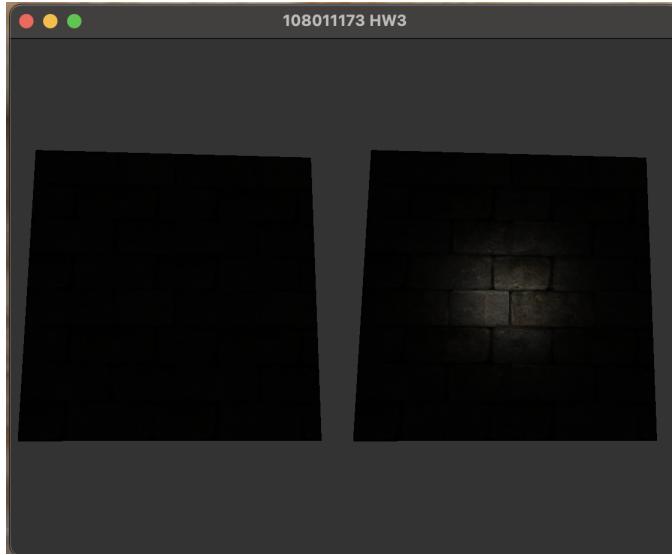
Directional light



Point light



Spotlight



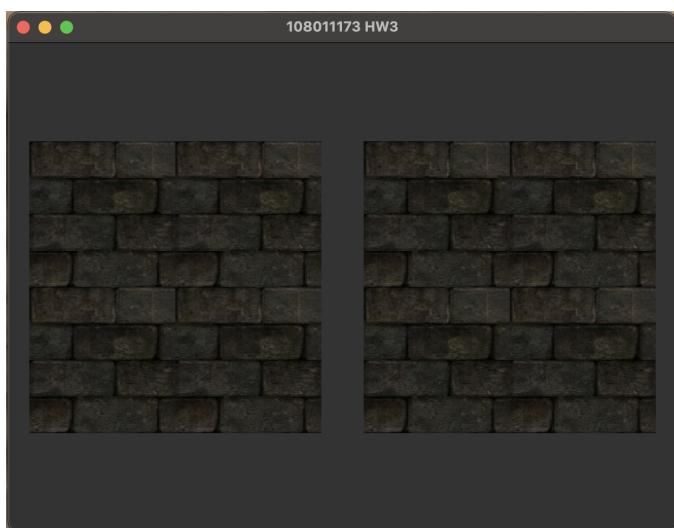
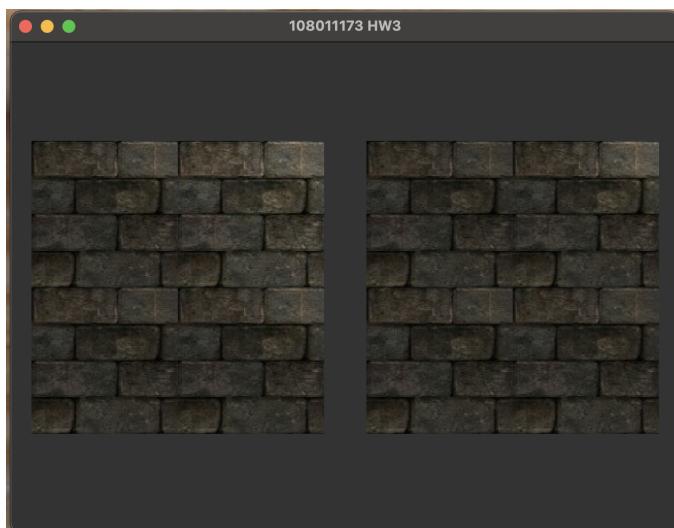
2. K : switch to light editing mode

- Description :

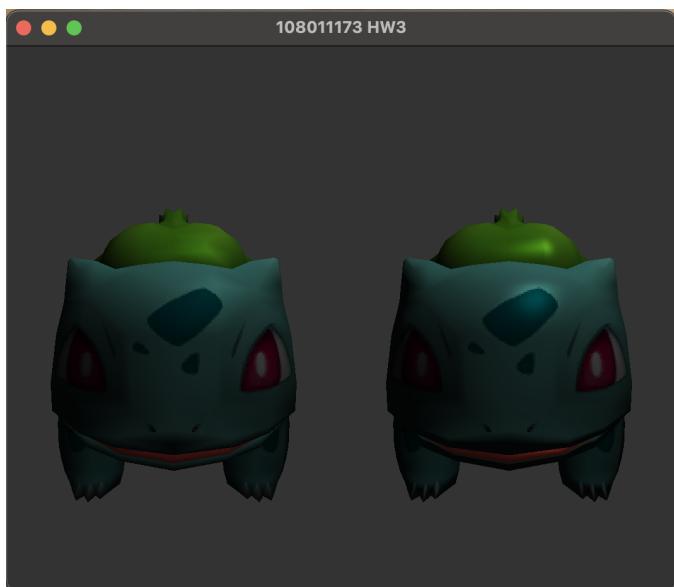
Press “K” to do the light editing, and press the left bottom of the mouse and drag it, we can change the position of the light sources.

 - For directional & point light: Scroll the mouse wheel, and we can change the brightness of the light sources respectively.
 - For spotlight: Scroll the mouse wheel, and we can change the range to be illuminated of the object.
- Screenshots :

Directional light



Point light



Spotlight

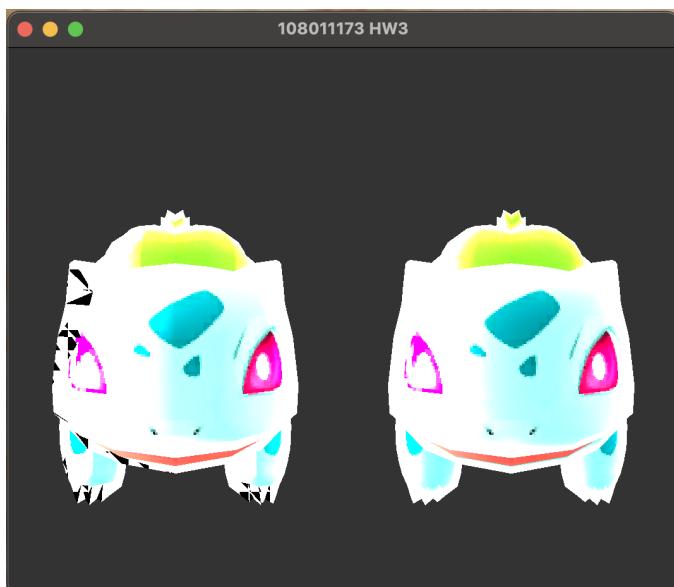
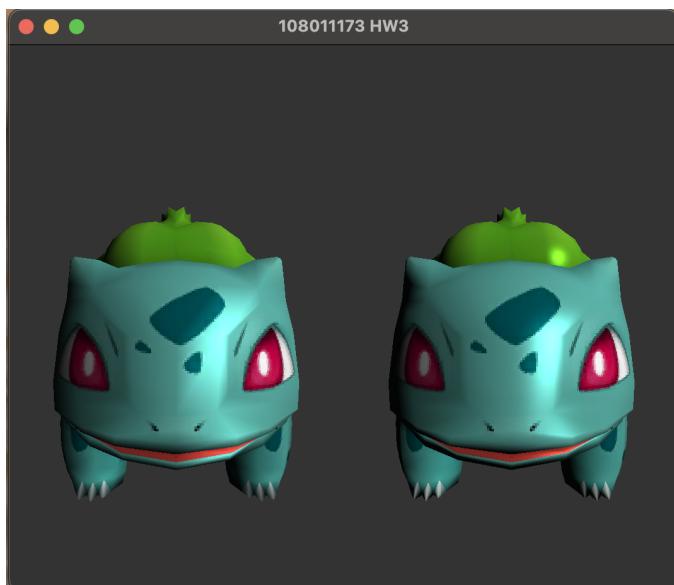


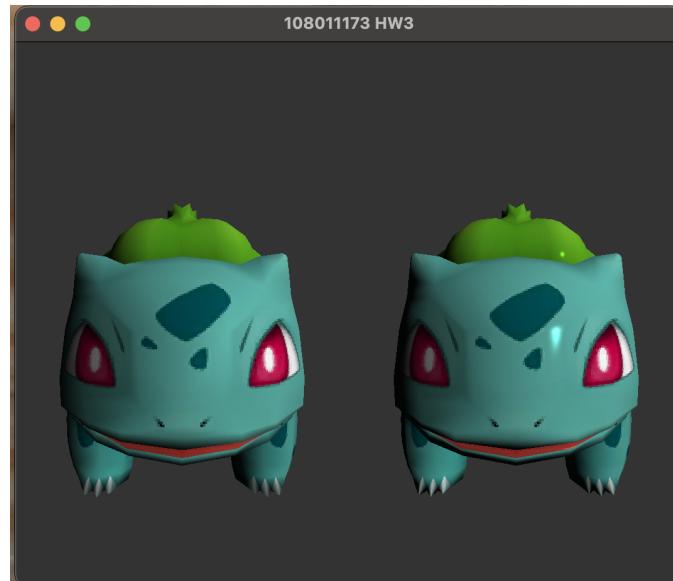
3. J : switch to shininess editing mode

- Description :

After pressing “J” button, we can do the shininess editing by scrolling the wheel of the mouse.

- Screenshot :





Texture Mapping

1. G : switch between linear & nearest in magnification texture filtering mode

- Description :

Press G to switch between linear & nearest in magnification texture filtering mode

Notice: 可以由傑尼龜的龜殼處觀得差異

- Screenshot :



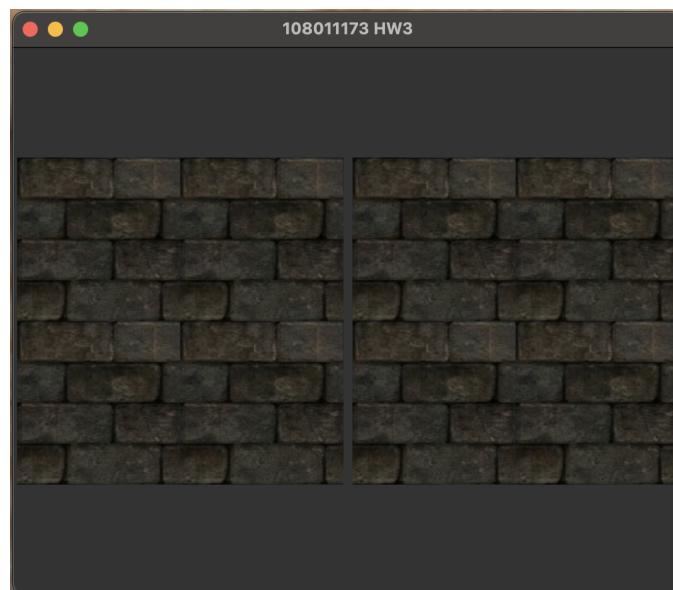


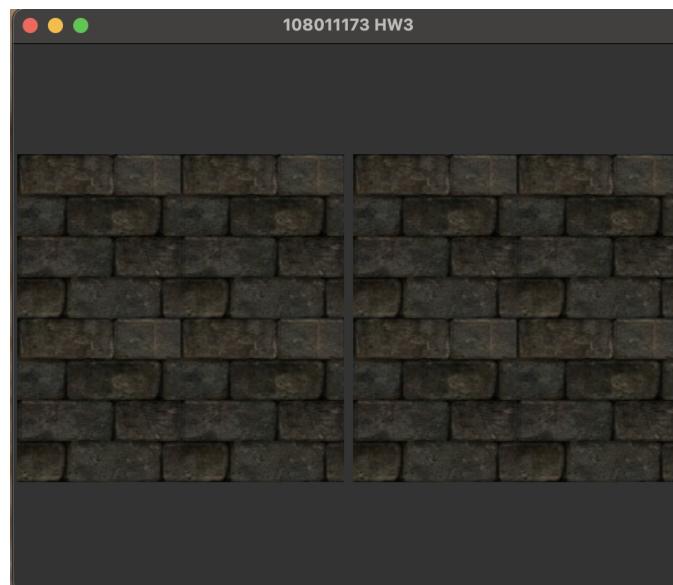
2. B : switch between linear_mipmap_linear & nearest_mipmap_linear in minification texture filtering mode

- Description :

Press B to switch between linear_mipmap_linear & nearest_mipmap_linear in minification texture filtering mode

- Screenshot :





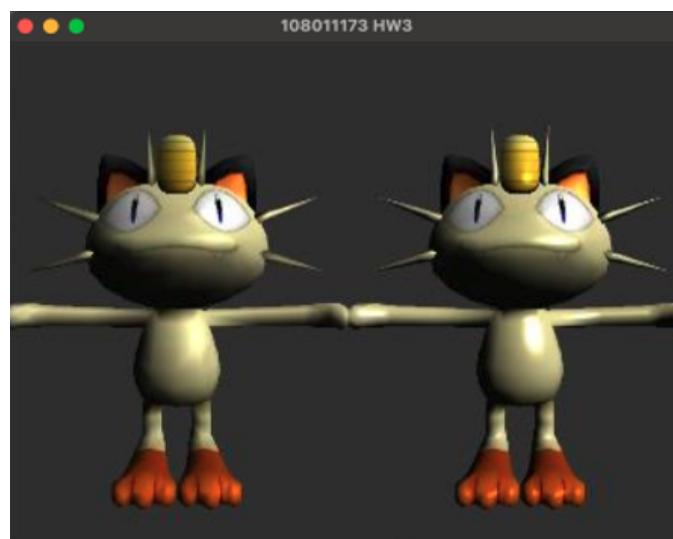
3. left & right : 更換寶可夢的表情

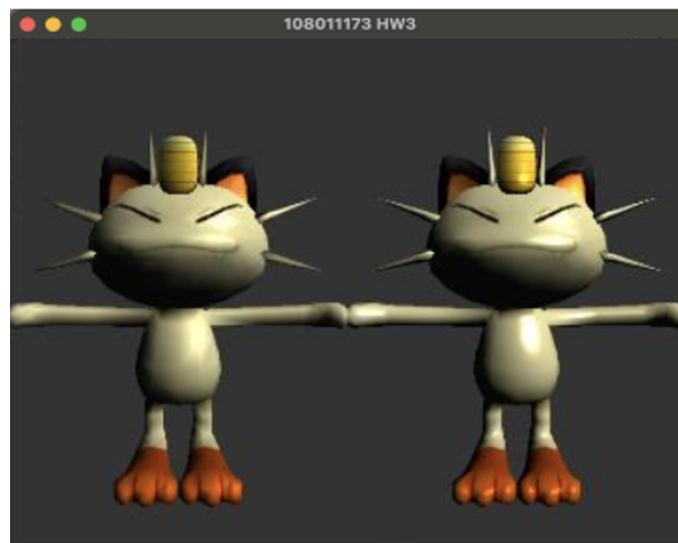
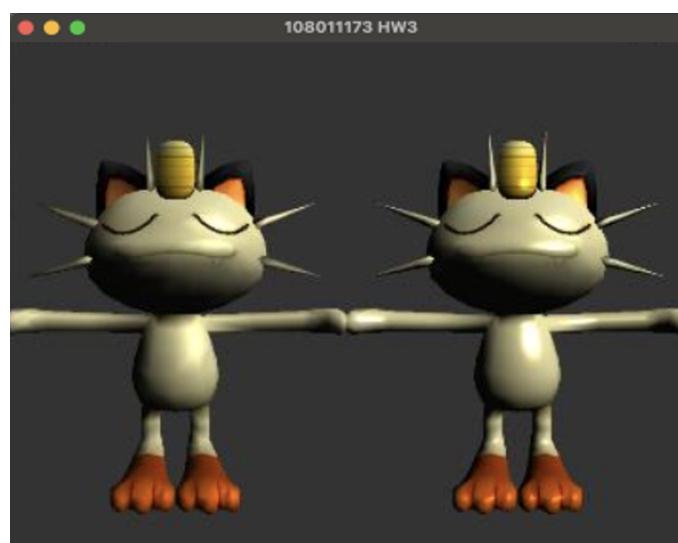
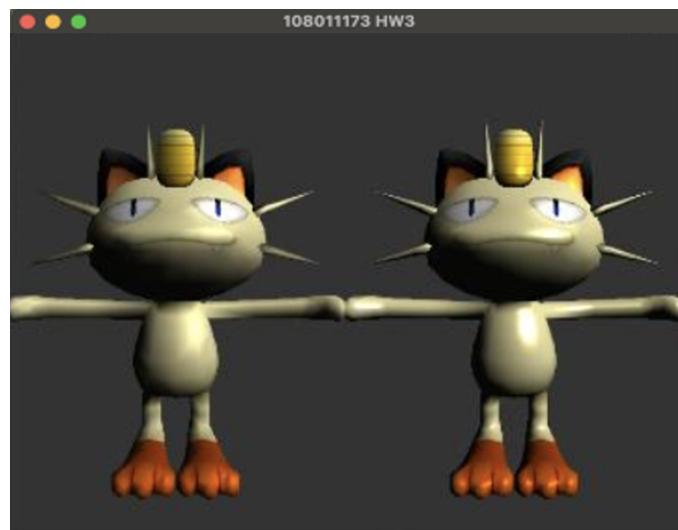
- Description :

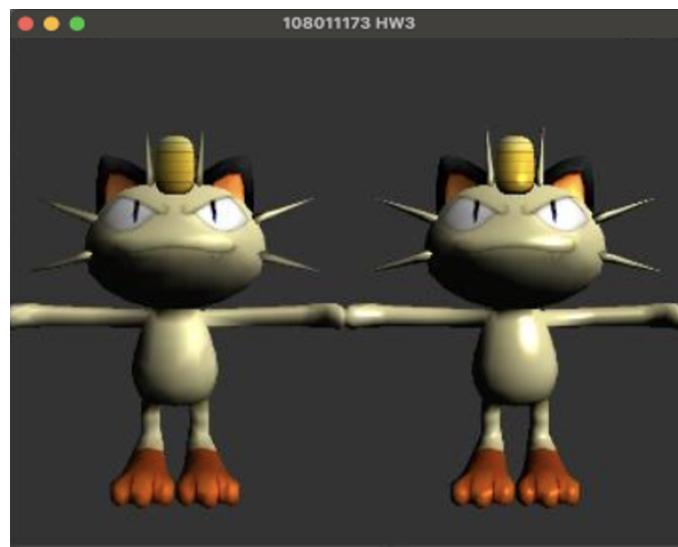
Press left → reverse order

Press right → normal order

- Screenshot :







4. Esc : Press “ esc “ button to close the window