Assignment 3-1

- Write down a Python program to..
- Draw a triangle using the render() function in the next slide (DO NOT modify it!)
  - Use **homogeneous coordinates**!
- If you press (not release or repeat) a key, the triangle should be transformed as shown in the Table:
- All transformations should be **accumulated** unless you press '1'.
  - You'll need a global variable to store current accumulated transformation

Key	Transformation
Q	Translate by -0.1 in x direction **w.r.t global coordinate**
E	Translate by 0.1 in x direction **w.r.t global coordinate**
A	Rotate by 10 degrees counterclockwise **w.r.t local coordinate**
D	Rotate by 10 degrees clockwise **w.r.t local coordinate**
1	Reset the triangle with identity matrix

Assignment 3-1

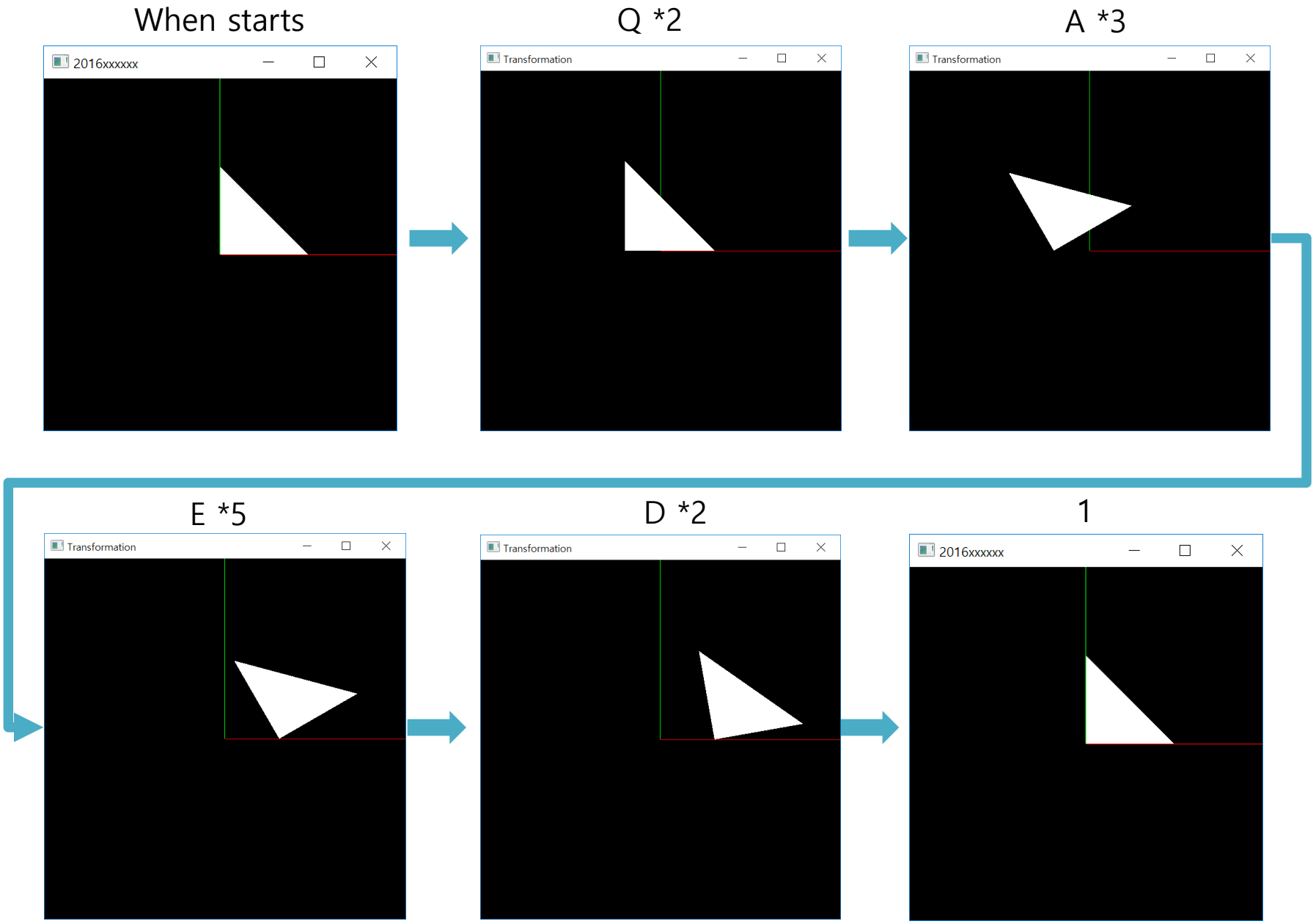
- render()

```
def render(T):
    glClear(GL_COLOR_BUFFER_BIT)
    glLoadIdentity()

    # draw cooridnate
    glBegin(GL_LINES)
    glColor3ub(255, 0, 0)
    glVertex2fv(np.array([0.,0.]))
    glVertex2fv(np.array([1.,0.]))
    glColor3ub(0, 255, 0)
    glVertex2fv(np.array([0.,0.]))
    glVertex2fv(np.array([0.,1.]))
    glEnd()

    # draw triangle
    glBegin(GL_TRIANGLES)
    glColor3ub(255, 255, 255)
    glVertex2fv( (T @ np.array([.0,.5,1.]))[:-1] )
    glVertex2fv( (T @ np.array([.0,.0,1.]))[:-1] )
    glVertex2fv( (T @ np.array([.5,.0,1.]))[:-1] )
    glEnd()
```

An example sequence of continuous transformation



How to Submit

- What you have to submit:
  - Only **one** .py file: ***main.py***
- Write down all your code to ***main.py***
- `> py -3 main.py` or `$ python3 main.py` should show your glfw window.

How to Submit

- Submit your assignment **only through the Assignment (과제) menu of the lecture home** at portal.hanyang.ac.kr.

- **Due date: Oct 9, 23:59**