

## Computer Graphics, Lab Assignment 2

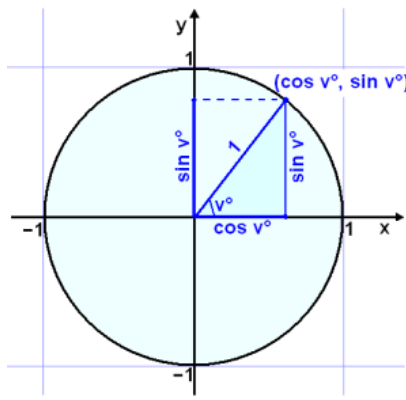
Handed out: March 23, 2022

**Recommended due: 11:00**, March 23, 2022

**Hard due: 23:59**, March 29, 2022 **(NO SCORE for late submissions!)**

1. Write down a Python program to draw a regular 12-sided polygon (dodecagon, 정 12 각형).
  - A. Set the window title to **[studentID]-[assignment#]-[prob#]** (e.g. **2017123456-2-2**) and the window size to (480,480).
  - B. Use `np.linspace()` (or `np.arange()`), `np.cos()`, `np.sin()` to compute the positions of vertices.
  - C. Do not hardcode the position of each vertex.
  - D. The 12 vertices should be specified counterclockwise starting from the vertex on the x-axis.

E.



(Hint)

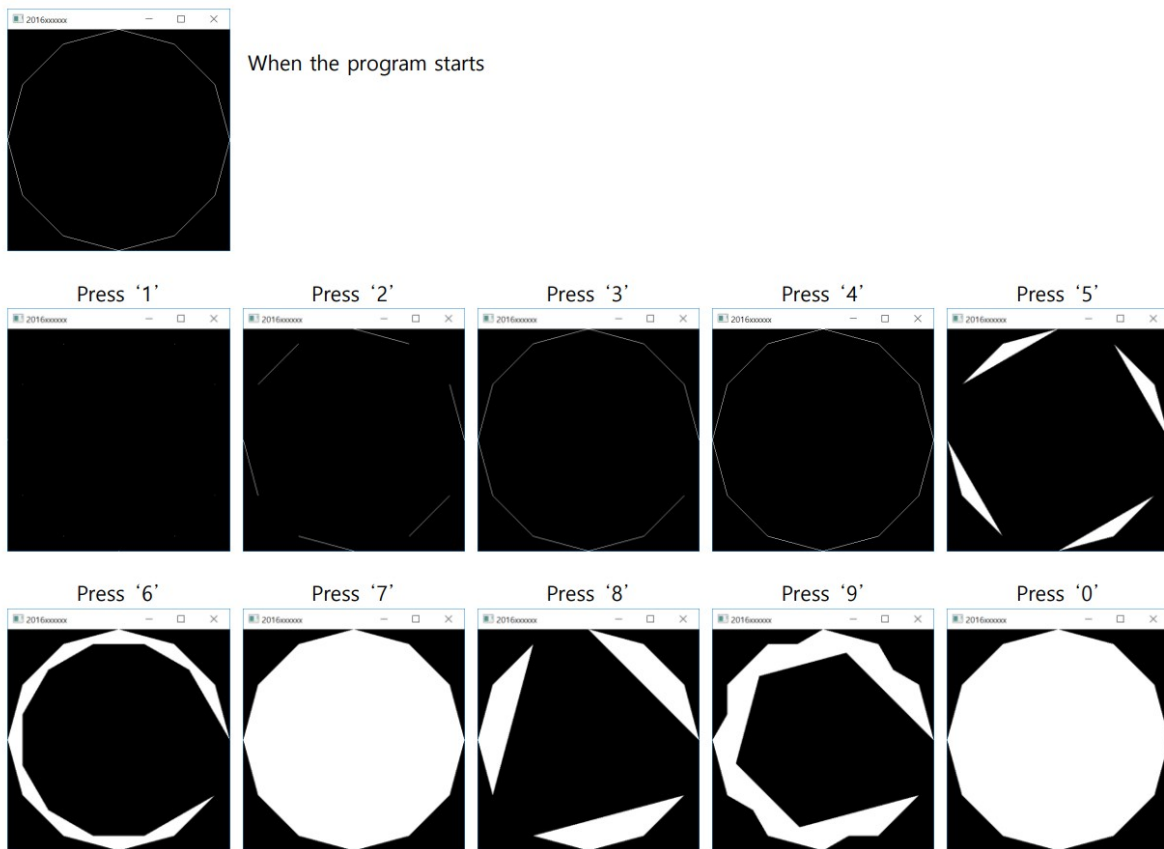
- F. If the keys 1, 2, 3, ... 9, 0 are entered, the primitive type should be changed.
  - i. Hint: Use a global variable to store the primitive type

Key	Primitive Type
1	GL_POINTS
2	GL_LINES
3	GL_LINE_STRIP
4	GL_LINE_LOOP
5	GL_TRIANGLES
6	GL_TRIANGLE_STRIP
7	GL_TRIANGLE_FAN
8	GL_QUADS
9	GL_QUAD_STRIP
10	GL_POLYGON

- A. Submit a single .py file - **[studentID]-[assignment#]-[prob#].py** (e.g. **2017123456-2-**

2.py)

B. Expected result:



1. Write down a Python program to draw a rotating triangle.

- Set the window title to **[studentID]-[assignment#]-[prob#]**. (e.g. **2017123456-3-1**) and the window size to (480,480).
- Draw a triangle using `render()` function below (DO NOT modify it!).

```
def render(T):
    glClear(GL_COLOR_BUFFER_BIT)
    glLoadIdentity()
    # draw coordinate
    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()
```

(e.g. **2017123456-3-**

- i. Do not mind the initial angle of the triangle.