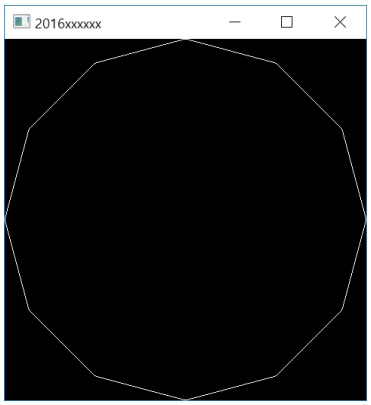
Computer Graphics, Lab Assignment 2

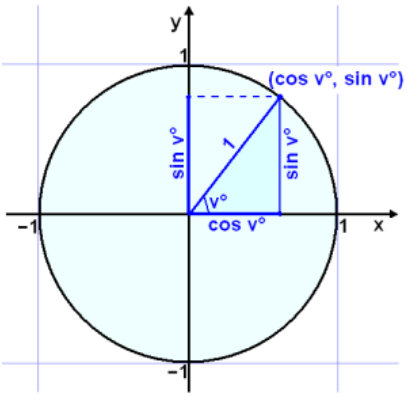
Handed out: April 2, 2019

Due: 23:59, April 9, 2019 **(NO SCORE for late submissions!)**

Submit your assignment only through Computer Graphics course page on Blackboard.

1. Write down a Python program to draw a regular 12-sided polygon (dodecagon, 정12각형).
   A. Set the window title to **CG_weekly_practice_03-1_studentID** (e.g. **CG_weekly_practice_03-1_2017123456**) and the window size to (480,480).
   B. Use np.linspace() (or np.arrange()), 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)





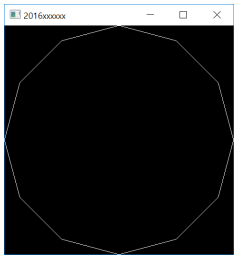
   F. If the keys 1, 2, 3, … 9, 0 are entered, the primitive type should be changed.
      i. Hint: Use a global variable to store the primitive type

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

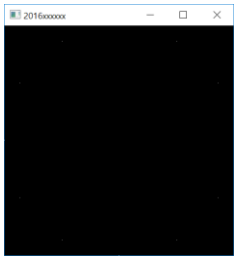
G. Submit a single .py file - **CG_weekly_practice_03-1_studentID.py** (e.g. **CG_weekly_practice_03-1_studentID.py**)

H. Expected result:

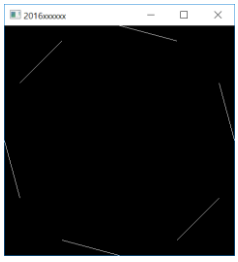


When the program starts

Press ‘1’



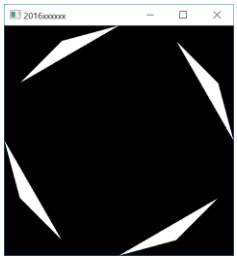
Press ‘2’



Press ‘3’

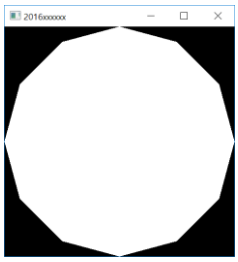
Press ‘4’

Press ‘5’

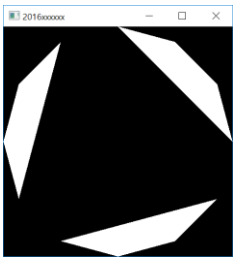


Press ‘6’

Press ‘7’

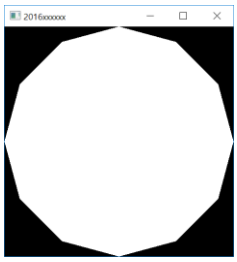


Press ‘8’



Press ‘9’

Press ‘0’



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

   A. Set the window title to **CG_weekly_practice_03-2_studentID**. (e.g. **CG_weekly_practice_03-2_studentID)** and the window size to (480,480).

   B. Draw a triangle using render() function below (DO NOT modify it!).

```
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()
```

   C. Submit a single .py file - **CG_weekly_practice_03-2_studentID.py.** (e.g. **CG_weekly_practice_03-2_studentID.py**)

   D. Expected result: CG_weekly_practice_03-2_sample.mp4 (uploaded)

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