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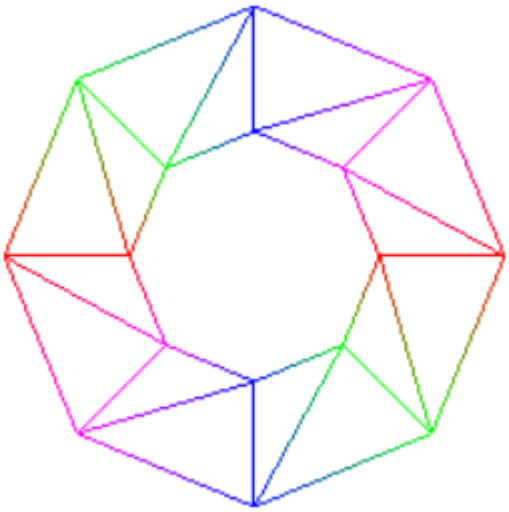
Grupa 351

Laborator 4

Exercițiu 3

Rezultat:



Cod:

→ definim vârfurile (ne folosim de indicația din enunț)

```
// Coordonatele varfurilor;
static const GLfloat Vertices[] =
{
    /*
    -15.0f, -15.0f,  0.0f,  1.0f,
     15.0f, -15.0f,  0.0f,  1.0f,
     15.0f,  15.0f,  0.0f,  1.0f,
    -15.0f,  15.0f,  0.0f,  1.0f
    */
    -minRadius, 0.0f,  0.0f,  1.0f,
     -minRadius * cos, minRadius* sin,  0.0f,  1.0f,
     0.0f,  minRadius,  0.0f,  1.0f,
     minRadius* cos, minRadius* sin,  0.0f,  1.0f,
     minRadius, 0.0f,  0.0f,  1.0f,
     minRadius* cos, -minRadius * sin,  0.0f,  1.0f,
     0.0f,  -minRadius,  0.0f,  1.0f,
     -minRadius * cos, -minRadius * sin,  0.0f,  1.0f,

     -maxRadius, 0.0f,  0.0f,  1.0f,
     -maxRadius * cos, maxRadius* sin,  0.0f,  1.0f,
     0.0f,  maxRadius,  0.0f,  1.0f,
     maxRadius* cos, maxRadius* sin,  0.0f,  1.0f,
     maxRadius, 0.0f,  0.0f,  1.0f,
     maxRadius* cos, -maxRadius * sin,  0.0f,  1.0f,
     0.0f,  -maxRadius,  0.0f,  1.0f,
     -maxRadius * cos, -maxRadius * sin,  0.0f,  1.0f,
```

unde minRadius, maxRadius, cos, sin au fost definite anterior

```
float minRadius = 10;
float maxRadius = 20;
float cos = 0.7071;
float sin = 0.7071;
```

→ definim culorile

```
//  Culorile ca atribute ale varfurilor;
static const GLfloat Colors[] =
{
    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,

    1.0f, 0.0f, 0.0f, 1.0f,
    0.0f, 1.0f, 0.0f, 1.0f,
    0.0f, 0.0f, 1.0f, 1.0f,
    1.0f, 0.0f, 1.0f, 1.0f,
```

→ definim indicii

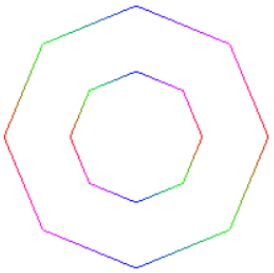
```
//  Indicii care determina ordinea de parcurgere a varfurilor;
static const GLuint Indices[] =
{
    0, 1, 2, 3, 4, 5, 6, 7, // contur exterior
    8, 9, 10, 11, 12, 13, 14, 15, // contur interior

    // segmentele care unesc cele doua contururi
    8, 0,
    9, 1,
    10, 2,
    11, 3,
    12, 4,
    13, 5,
    14, 6,
    15, 7

};
```

→ în RenderFunction():

```
//  Functia de desenarea a graficii pe ecran;
void RenderFunction(void)
{
    glClear(GL_COLOR_BUFFER_BIT);           //  Se curata ecranul OpenGL pentru a fi desenat noul continut;
    //  Transmiterea variabilei uniforme pentru MATRICEA DE TRANSFORMARE spre shadere;
    myMatrix = resizeMatrix;
    glUniformMatrix4fv(myMatrixLocation, 1, GL_FALSE, &myMatrix[0][0]);
    //  Desenarea primitivelor
    //  Functia glDrawElements primeste 4 argumente:
    //    - arg1 = modul de desenare;
    //    - arg2 = numarul de varfuri;
    //    - arg3 = tipul de date al indicilor;
    //    - arg4 = pointer spre indici (EBO): pozitia de start a indicilor;
    glDrawElements(GL_LINE_LOOP, 8, GL_UNSIGNED_INT, (void*)(0));
    glDrawElements(GL_LINE_LOOP, 8, GL_UNSIGNED_INT, (void*)(8 * sizeof(int)));
    glDrawElements(GL_LINE_LOOP, 16, GL_UNSIGNED_INT, (void*)(16 * sizeof(int)));
    //  EXERCITIU: De realizat desenul folosind segmente de dreapta;
    glFlush();                              //  Asigura rularea tuturor comenzilor OpenGL apelate anterior;
}
```

primul glDrawElements() desenează conturul exterior dat de cele 8 puncte pe cerc

al doilea glDrawElements() desenează conturul interior



al treilea glDrawElements() unește punctele de la conturul interior și cel exterior