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Grafika Komputer A

TUGAS WEB-GL
GRAFIKA KOMPUTER

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Repositori Github: https://github.com/njabdullah/Square-Box-WebGL

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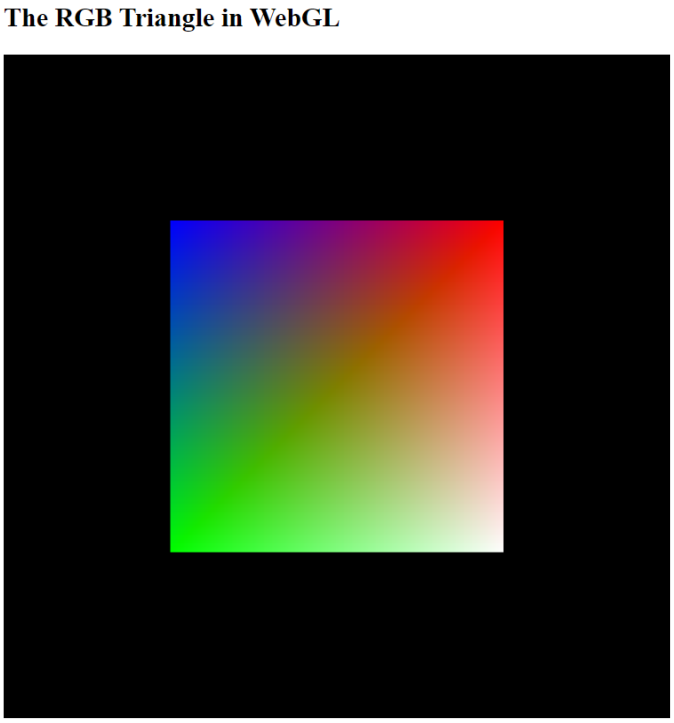
Tugas 1
Membuat sebuah persegi menggunakan dua buah segitiga menggunakan Web-GL



Bentuk tersebut saya buat dengan menggubah beberapa codingan sebagai berikut:

```
function draw() {

    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT);

    // Segitiga pertama dengan koordinat berikut
    let  coords = new Float32Array([-0.5, -0.5, -0.5, 0.5, 0.5, 0.5 ]);

    gl.bindBuffer(gl.ARRAY_BUFFER, bufferCoords);
    gl.bufferData(gl.ARRAY_BUFFER, coords, gl.STREAM_DRAW);
    gl.vertexAttribPointer(attributeCoords, 2, gl.FLOAT, false, 0, 0);
    gl.enableVertexAttribArray(attributeCoords);

    // Pewarnaan segitiga pertama (RGB)
    let  color = new Float32Array( [0,1,0, 0,0,1, 1,0,0] );

    gl.bindBuffer(gl.ARRAY_BUFFER, bufferColor);
    gl.bufferData(gl.ARRAY_BUFFER, color, gl.STREAM_DRAW);
    gl.vertexAttribPointer(attributeColor, 3, gl.FLOAT, false, 0, 0);
    gl.enableVertexAttribArray(attributeColor);

    // Menggambar segitiga
    gl.drawArrays(gl.TRIANGLES, 0, 3);

    // Segitiga kedua dengan koordinat berikut
    let  coords2 = new Float32Array([-0.5, -0.5, 0.5, -0.5, 0.5, 0.5]);
```

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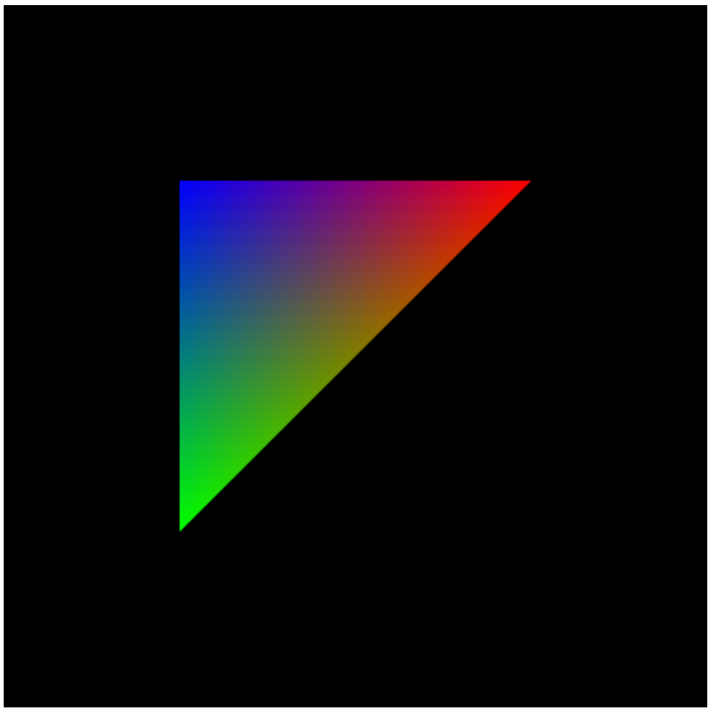
```
    gl.bindBuffer(gl.ARRAY_BUFFER, bufferCoords);
    gl.bufferData(gl.ARRAY_BUFFER, coords2, gl.STREAM_DRAW);
    gl.vertexAttribPointer(attributeCoords, 2, gl.FLOAT, false, 0, 0);
    gl.enableVertexAttribArray(attributeCoords);

    // Pewarnaan segitiga kedua (RGB)
    let  color2 = new Float32Array( [0,1,0, 1,1,1, 1,0,0] );

    gl.bindBuffer(gl.ARRAY_BUFFER, bufferColor);
    gl.bufferData(gl.ARRAY_BUFFER, color2, gl.STREAM_DRAW);
    gl.vertexAttribPointer(attributeColor, 3, gl.FLOAT, false, 0, 0);
    gl.enableVertexAttribArray(attributeColor);

    gl.drawArrays(gl.TRIANGLES, 0, 3);
}
```

Segitiga pertama dibuat dengan koordinat ([-0.5, -0.5, -0.5, 0.5, 0.5, 0.5])



Segitiga kedua dibuat dengan koordinat ([-0.5, -0.5, 0.5, -0.5, 0.5, 0.5])

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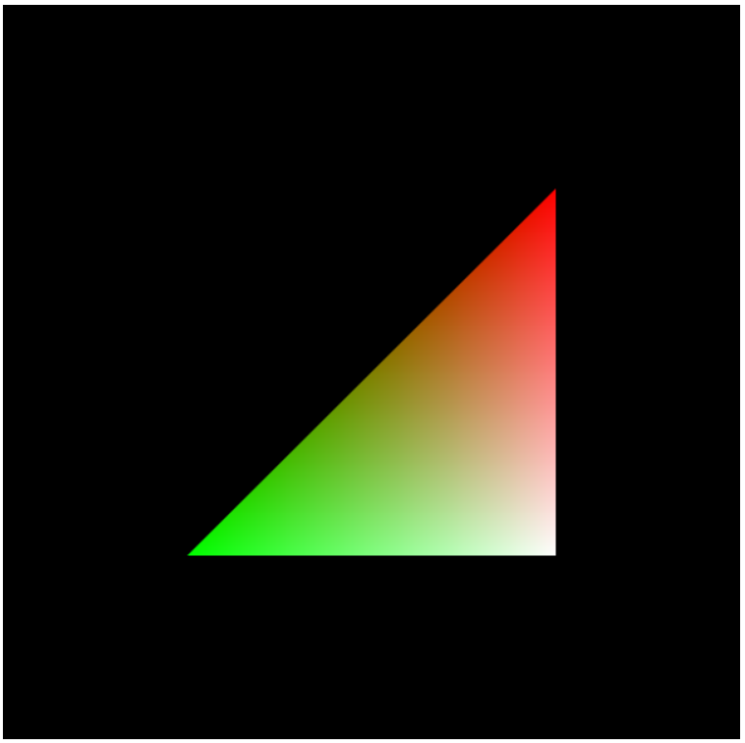
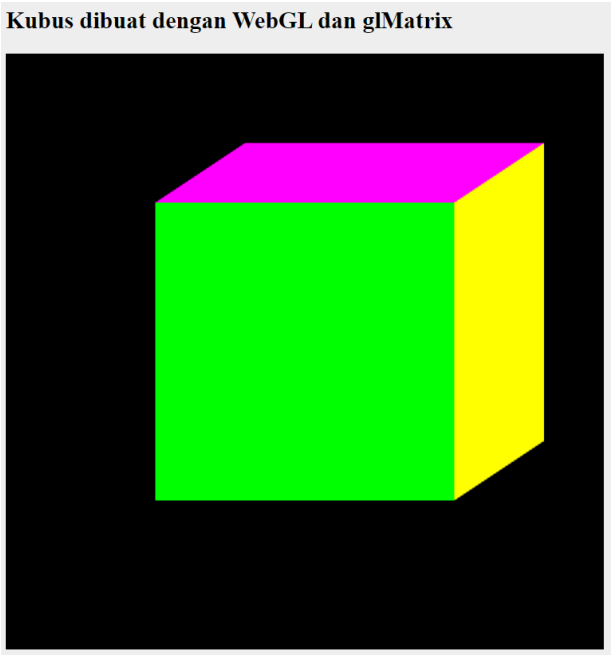


Tugas 2
Membuat sebuah cube. Berikut merupakan cube yang sudah saya buat.



Cube tersebut dibuat menggunakan draw triangle pada setiap sisinya. Dalam satu sisi cube tersebut dibutuhkan 2 segitiga. Berikut adalah code yang telah saya modifikasi

```
function draw()
```

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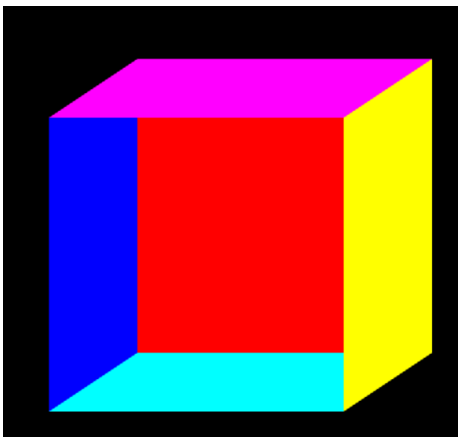
```
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

    /* Draw the six faces of a cube, with different colors. */

         drawPrimitive(  gl.TRIANGLE_FAN,  [0,1,0,1],  [-0.5,-0.5,-0.5,
-0.5,0.5,-0.5, 0.5,0.5,-0.5, 0.5,-0.5,-0.5]); // Depan
          drawPrimitive(  gl.TRIANGLE_FAN,  [1,0,1,1],  [0.5,0.5,-0.5,
-0.5,0.5,-0.5, -0.2,0.7,0.5, 0.8, 0.7, 0.5]); // Atas
         drawPrimitive(  gl.TRIANGLE_FAN,  [1,0,0,1],  [-0.2,-0.3,0.5,
-0.2,0.7,0.5, 0.8,0.7,0.5, 0.8,-0.3,0.5]); // Belakang
         drawPrimitive(  gl.TRIANGLE_FAN,  [0,0,1,1],  [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5, -0.2,-0.3,0.5, -0.2,0.7,0.5]); // Kiri
          drawPrimitive(  gl.TRIANGLE_FAN,  [1,1,0,1],  [0.5,0.5,-0.5,
0.5,-0.5,-0.5, 0.8,-0.3,0.5, 0.8,0.7,0.5]); // Kanan
         drawPrimitive(  gl.TRIANGLE_FAN,  [0,1,1,1],  [-0.5,-0.5,-0.5,
-0.2,-0.3,0.5, 0.8,-0.3,0.5, 0.5,-0.5,-0.5]); // Bawah
}
```

Dalam pembuatan cube tersebut, dapat divisualisasikan beberapa tampilan, seperti

a. Tanpa sisi depan



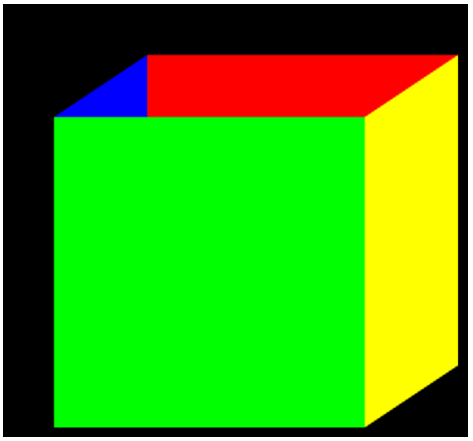
```
function draw()
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

    /* Draw the six faces of a cube, with different colors. */

              //    drawPrimitive(    gl.TRIANGLE_FAN,    [0,1,0,1],
[-0.5,-0.5,-0.5, -0.5,0.5,-0.5, 0.5,0.5,-0.5, 0.5,-0.5,-0.5]); //
Depan
       drawPrimitive( gl.TRIANGLE_FAN, [1,0,1,1], [0.5,0.5,-0.5,
-0.5,0.5,-0.5, -0.2,0.7,0.5, 0.8, 0.7, 0.5]); // Atas
      drawPrimitive( gl.TRIANGLE_FAN, [1,0,0,1], [-0.2,-0.3,0.5,
-0.2,0.7,0.5, 0.8,0.7,0.5, 0.8,-0.3,0.5]); // Belakang
      drawPrimitive( gl.TRIANGLE_FAN, [0,0,1,1], [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5, -0.2,-0.3,0.5, -0.2,0.7,0.5]); // Kiri
       drawPrimitive( gl.TRIANGLE_FAN, [1,1,0,1], [0.5,0.5,-0.5,
0.5,-0.5,-0.5, 0.8,-0.3,0.5, 0.8,0.7,0.5]); // Kanan
```

```
      drawPrimitive( gl.TRIANGLE_FAN, [0,1,1,1], [-0.5,-0.5,-0.5,
-0.2,-0.3,0.5, 0.8,-0.3,0.5, 0.5,-0.5,-0.5]); // Bawah
}
```

b. Tanpa sisi atas



```
function draw()
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

    /* Draw the six faces of a cube, with different colors. */

      drawPrimitive( gl.TRIANGLE_FAN, [0,1,0,1], [-0.5,-0.5,-0.5,
-0.5,0.5,-0.5, 0.5,0.5,-0.5, 0.5,-0.5,-0.5]); // Depan
     // drawPrimitive( gl.TRIANGLE_FAN, [1,0,1,1], [0.5,0.5,-0.5,
-0.5,0.5,-0.5, -0.2,0.7,0.5, 0.8, 0.7, 0.5]); // Atas
      drawPrimitive( gl.TRIANGLE_FAN, [1,0,0,1], [-0.2,-0.3,0.5,
-0.2,0.7,0.5, 0.8,0.7,0.5, 0.8,-0.3,0.5]); // Belakang
      drawPrimitive( gl.TRIANGLE_FAN, [0,0,1,1], [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5, -0.2,-0.3,0.5, -0.2,0.7,0.5]); // Kiri
       drawPrimitive( gl.TRIANGLE_FAN, [1,1,0,1], [0.5,0.5,-0.5,
0.5,-0.5,-0.5, 0.8,-0.3,0.5, 0.8,0.7,0.5]); // Kanan
      drawPrimitive( gl.TRIANGLE_FAN, [0,1,1,1], [-0.5,-0.5,-0.5,
-0.2,-0.3,0.5, 0.8,-0.3,0.5, 0.5,-0.5,-0.5]); // Bawah
}
```

c. Tanpa sisi samping kanan

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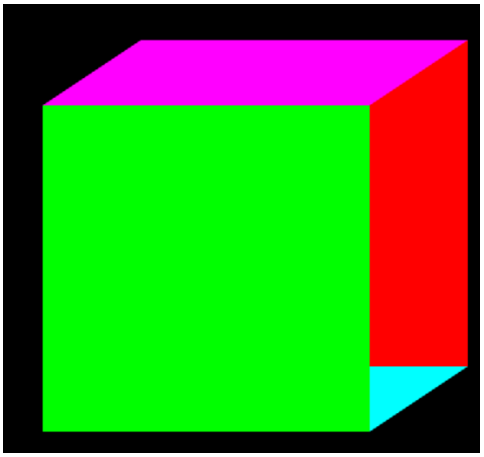

```
function draw()
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

    /* Draw the six faces of a cube, with different colors. */

      drawPrimitive( gl.TRIANGLE_FAN, [0,1,0,1], [-0.5,-0.5,-0.5,
-0.5,0.5,-0.5, 0.5,0.5,-0.5, 0.5,-0.5,-0.5]); // Depan
       drawPrimitive( gl.TRIANGLE_FAN, [1,0,1,1], [0.5,0.5,-0.5,
-0.5,0.5,-0.5, -0.2,0.7,0.5, 0.8, 0.7, 0.5]); // Atas
      drawPrimitive( gl.TRIANGLE_FAN, [1,0,0,1], [-0.2,-0.3,0.5,
-0.2,0.7,0.5, 0.8,0.7,0.5, 0.8,-0.3,0.5]); // Belakang
      drawPrimitive( gl.TRIANGLE_FAN, [0,0,1,1], [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5, -0.2,-0.3,0.5, -0.2,0.7,0.5]); // Kiri
     // drawPrimitive( gl.TRIANGLE_FAN, [1,1,0,1], [0.5,0.5,-0.5,
0.5,-0.5,-0.5, 0.8,-0.3,0.5, 0.8,0.7,0.5]); // Kanan
      drawPrimitive( gl.TRIANGLE_FAN, [0,1,1,1], [-0.5,-0.5,-0.5,
-0.2,-0.3,0.5, 0.8,-0.3,0.5, 0.5,-0.5,-0.5]); // Bawah
}
```

d. Tanpa sisi depan dan kanan

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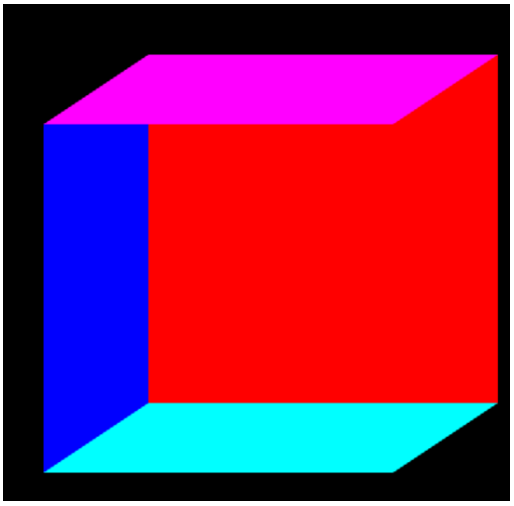

```
function draw()
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

    /* Draw the six faces of a cube, with different colors. */

              //    drawPrimitive(    gl.TRIANGLE_FAN,    [0,1,0,1],
[-0.5,-0.5,-0.5,  -0.5,0.5,-0.5,  0.5,0.5,-0.5,  0.5,-0.5,-0.5]); //
Depan
       drawPrimitive(  gl.TRIANGLE_FAN,  [1,0,1,1],  [0.5,0.5,-0.5,
-0.5,0.5,-0.5,  -0.2,0.7,0.5,  0.8,  0.7,  0.5]); // Atas
      drawPrimitive(  gl.TRIANGLE_FAN,  [1,0,0,1],  [-0.2,-0.3,0.5,
-0.2,0.7,0.5,  0.8,0.7,0.5,  0.8,-0.3,0.5]); // Belakang
      drawPrimitive(  gl.TRIANGLE_FAN,  [0,0,1,1],  [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5,  -0.2,-0.3,0.5,  -0.2,0.7,0.5]); // Kiri
     // drawPrimitive(  gl.TRIANGLE_FAN,  [1,1,0,1],  [0.5,0.5,-0.5,
0.5,-0.5,-0.5,  0.8,-0.3,0.5,  0.8,0.7,0.5]); // Kanan
      drawPrimitive(  gl.TRIANGLE_FAN,  [0,1,1,1],  [-0.5,-0.5,-0.5,
-0.2,-0.3,0.5,  0.8,-0.3,0.5,  0.5,-0.5,-0.5]); // Bawah
}
```

e. Sisi samping kanan

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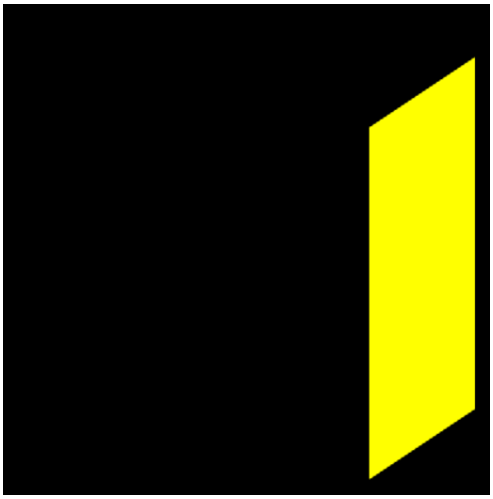

```
function draw()
{
    gl.clearColor(0,0,0,1);
    gl.clear(gl.COLOR_BUFFER_BIT | gl.DEPTH_BUFFER_BIT);

            //    drawPrimitive(    gl.TRIANGLE_FAN,    [0,1,0,1],
[-0.5,-0.5,-0.5,  -0.5,0.5,-0.5,  0.5,0.5,-0.5,  0.5,-0.5,-0.5]); //
Depan
     // drawPrimitive( gl.TRIANGLE_FAN, [1,0,1,1], [0.5,0.5,-0.5,
-0.5,0.5,-0.5,  -0.2,0.7,0.5,  0.8,  0.7,  0.5]); // Atas
    // drawPrimitive( gl.TRIANGLE_FAN, [1,0,0,1], [-0.2,-0.3,0.5,
-0.2,0.7,0.5,  0.8,0.7,0.5,  0.8,-0.3,0.5]); // Belakang
    // drawPrimitive( gl.TRIANGLE_FAN, [0,0,1,1], [-0.5,0.5,-0.5,
-0.5,-0.5,-0.5,  -0.2,-0.3,0.5,  -0.2,0.7,0.5]); // Kiri
       drawPrimitive(  gl.TRIANGLE_FAN,  [1,1,0,1],  [0.5,0.5,-0.5,
0.5,-0.5,-0.5,  0.8,-0.3,0.5,  0.8,0.7,0.5]); // Kanan
            //    drawPrimitive(    gl.TRIANGLE_FAN,    [0,1,1,1],
[-0.5,-0.5,-0.5,  -0.2,-0.3,0.5,  0.8,-0.3,0.5,  0.5,-0.5,-0.5]); //
Bawah
}
```