

Računarska grafika



Čas 01 - Uvod

Profesori i asistenti

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Pitanja i zakazivanje konsultacija putem mail-a.

Projektni zadatak

- 50 pts
- Dve kontrolne tačke
- Vodi se računa o (ne)radu

Tehnologija

Programabilni pipeline u OpenGL-u i GLSL-u. Upotrebljene biblioteke:

- GLEW,
- GLFW,
- GLM

Ukoliko postoji interesovanje za drugu tehnologiju / okruženje, javiti se na ivosevic.jovan@uns.ac.rs.

Literatura

- Red book <http://www.glprogramming.com/red/>
- Materijal sa vežbi
- learnopengl.com
- Samostalno istraživanje (YT kanali poput OGLdev, TheCherno, Casey Muratori, ...)

OpenGL

Open Graphics Library - grafički API niskog nivoa za iscrtavanje 2D i 3D vektorske grafike s ciljem ostvarenja hardverski ubrzanog iscrtavanja; realizovan kao automat stanja.

OpenGL istorija

- Nastao kao otvorena alternativa IrisGL-u iz potrebe za standardizacijom
- Inkrementalne revizije:
 - OpenGL 1.1 - glBindTexture
 - OpenGL 2.0 - GLSL
 - OpenGL 3.2 - Deprekacije, core i compatibility konteksti
 - ...

OpenGL vs DirectX

- Otvoren standard
- Khronos group (Google, Intel, Nvidia, ...)
- Multi-platformska biblioteka

- Zatvoren (proprietary) standard
- Microsoft
- Isključivo na Microsoft platformama

OpenGL nomenklatura

Većinom ispoštovana nomenklatura funkcije:

```
glNazivFunkcije{1234}{b s i i64 f d ub us ui ui64}{v}
```



glVertex3fv(p)



p je pokazivač ka nizu

Primer upotrebe

```
// Set the color
glColor3f(0.5f, 0.5f, 0.5f);

// Output vertices
glVertex3f(2.0f, 3.0f, 4.0f);
glVertex4f(2.0f, 1.0f, 10.0f,
1.0f);

...

// Set polygon mode
glPolygonMode(GL_FRONT, GL_FILL);
```



v1

v0

v2

v3

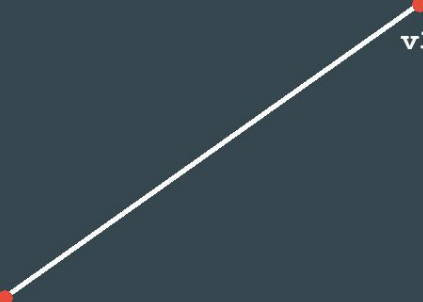
GL_POINTS

v1 v0



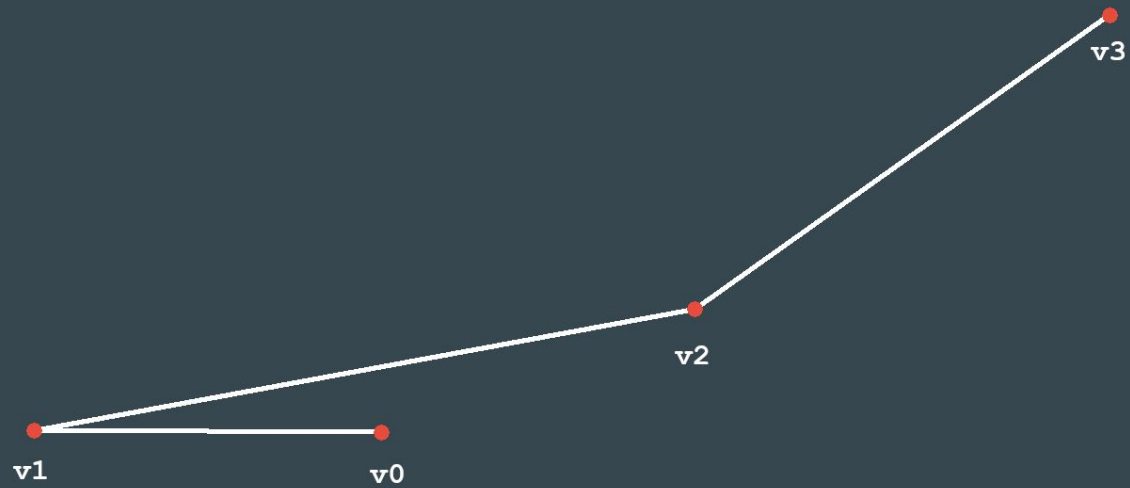
A horizontal line segment is drawn between two red dots. The dot on the left is labeled 'v1' and the dot on the right is labeled 'v0'.

v2 v3

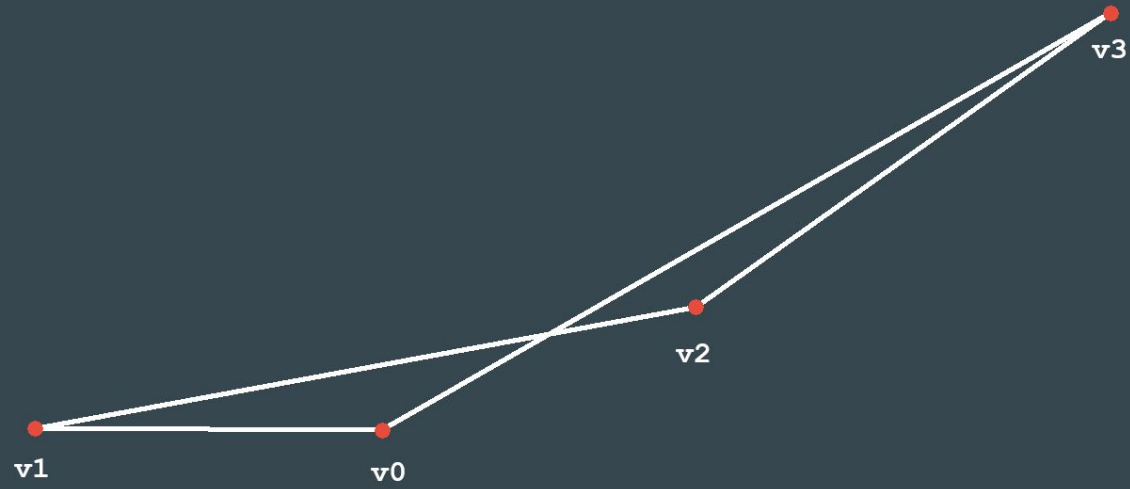


A diagonal line segment is drawn between two red dots. The dot at the bottom-left is labeled 'v2' and the dot at the top-right is labeled 'v3'.

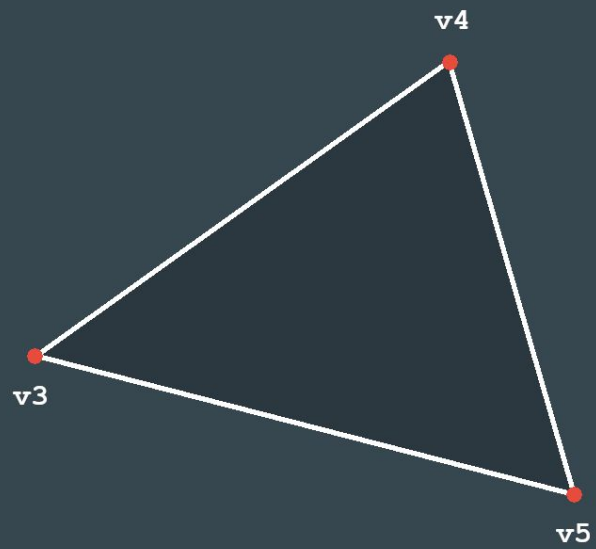
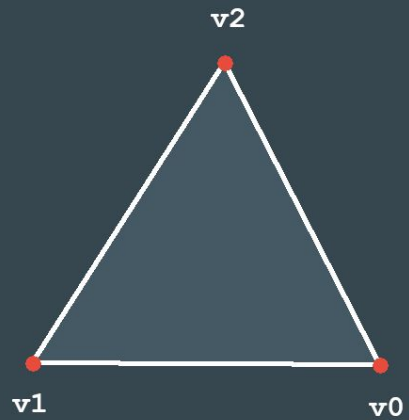
GL_LINES



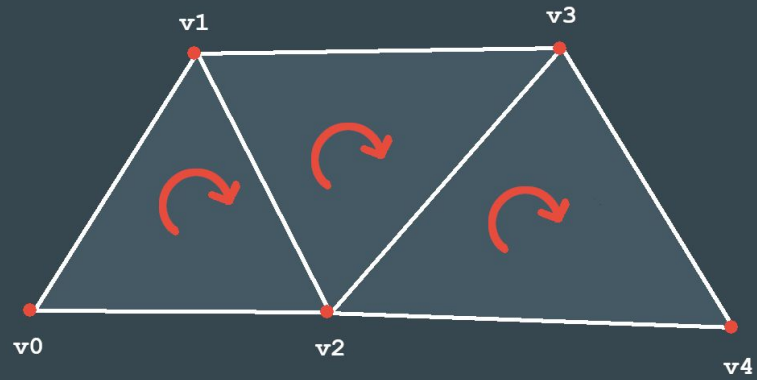
`GL_LINE_STRIP`



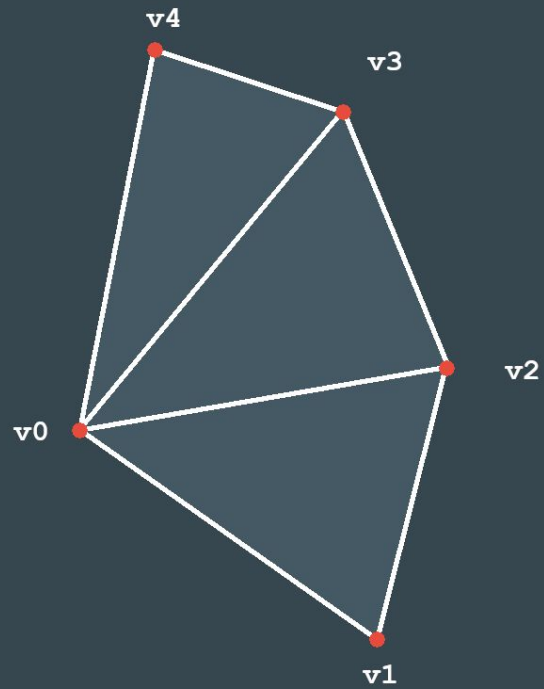
`GL_LINE_LOOP`



GL_TRIANGLES



`GL_TRIANGLE_STRIP`



GL_TRIANGLE_FAN