CMSC427
Rendering polylines
Points, polylines and polygons

Points | Polyline | Polygon

Polyline can be rendered as each
Points, polylines and polygons

https://processing.org/reference/beginShape_.html

Points

```
beginShape(POINTS);
vertex(30, 75); // v0
vertex(40, 20); // v1
vertex(50, 75); // v2
...
endShape();
```

Polyline

```
noFill();
beginShape();
vertex(30, 75); // v0
vertex(40, 20); // v1
vertex(50, 75); // v2
...
endShape();
```

Polygon

```
fill(255);
beginShape();
vertex(30, 75); // v0
vertex(40, 20); // v1
vertex(50, 75); // v2
...
endShape(CLOSE);
```
OpenGL primitives (WebGL version)

- gl.POINTS
- gl.LINES
- gl.LINE_STRIP
- gl.LINE_LOOP
- gl.TRIANGLES
- gl.TRIANGLE_STRIP
- gl.TRIANGLE_FAN
Triangle strips and efficiency

Vertex in red is shared with how many triangles?
Triangle strips and efficiency

```plaintext
beginShape(TRIANGLE_STRIP);
  vertex(30, 75); // v0
  vertex(40, 20); // v1
  vertex(50, 75); // v2
  vertex(60, 20); // v3
  vertex(70, 75); // v4
  vertex(80, 20); // v5
  vertex(90, 75); // v6
endShape(CLOSE);
```

Vertices belonging to multiple triangles not repeated.
Order of vertices to triangle strip this polygon?

A B C D E F G H I
Order of vertices to triangle strip this polygon?
Order of vertices to triangle fan this polygon?

A
B
C
D
E
F
G
H
What you should know after today

1. Polylines can be rendered in multiple ways, from points to triangles to strips to fans.
2. How to look up and use the `beginShape()` options in Processing (or similar mechanisms in OpenGL, WebGL, etc.)
3. That strips and fans allow for efficient transmission of vertices.
4. How to order vertices to make a strip or fan.
Today’s resources

• Processing
  • https://processing.org
  • Example program BeginShapeExample.pde