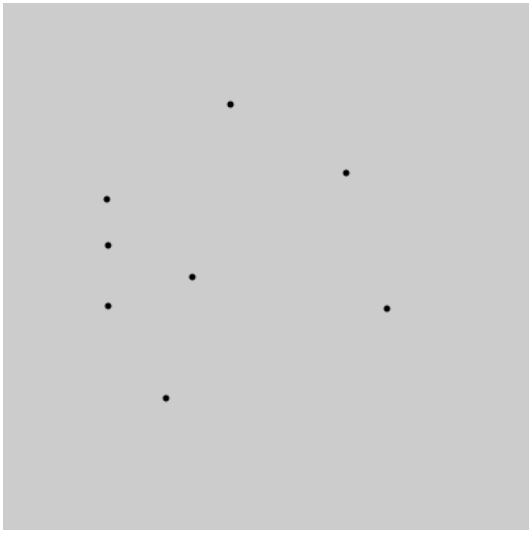
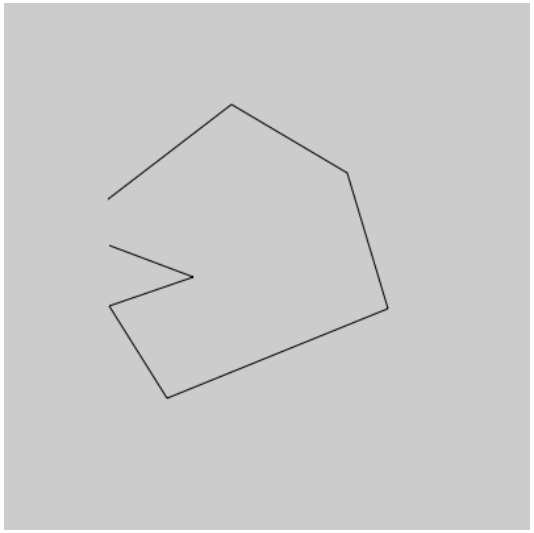
CMSC427
Rendering polylines

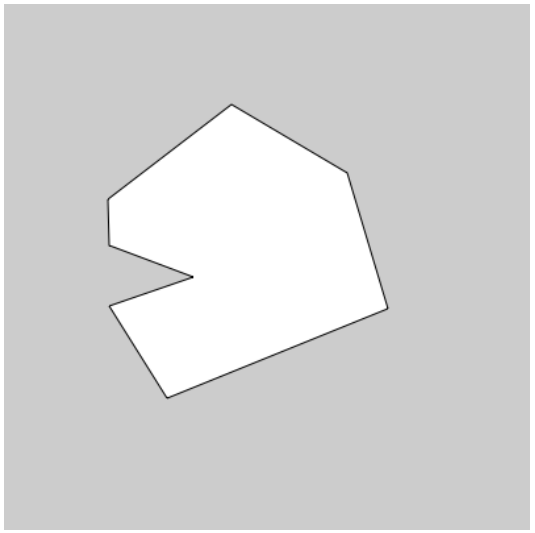
Points, polylines and polygons



Points



Polyline

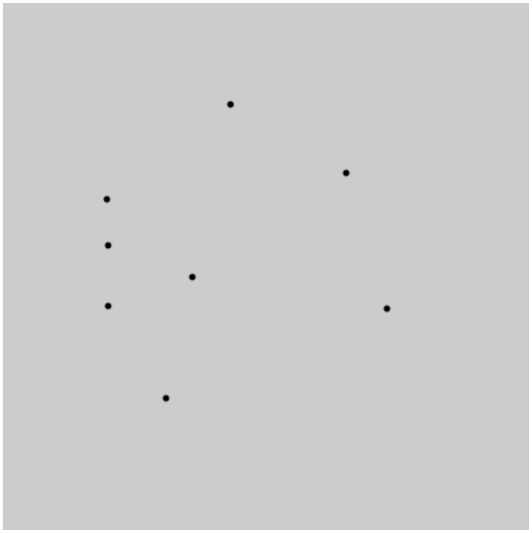


Polygon

Polyline can be rendered as each

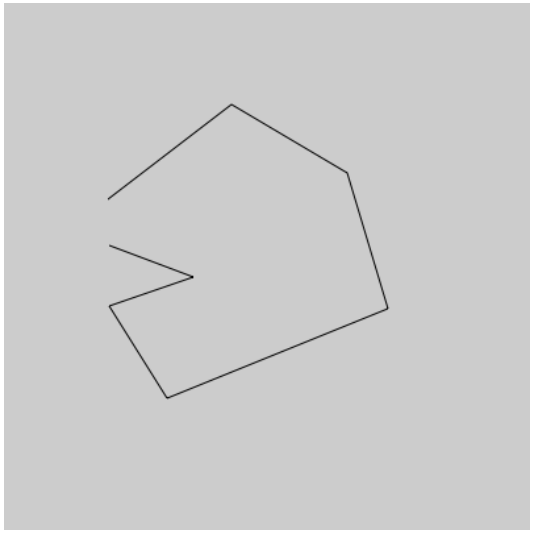
Points, polylines and polygons

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



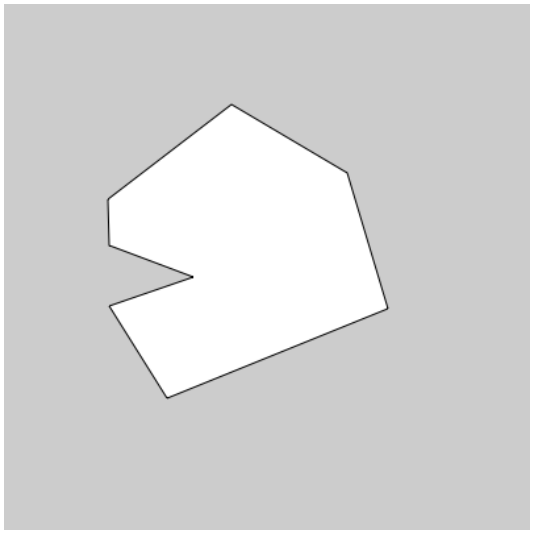
Points

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



Polyline

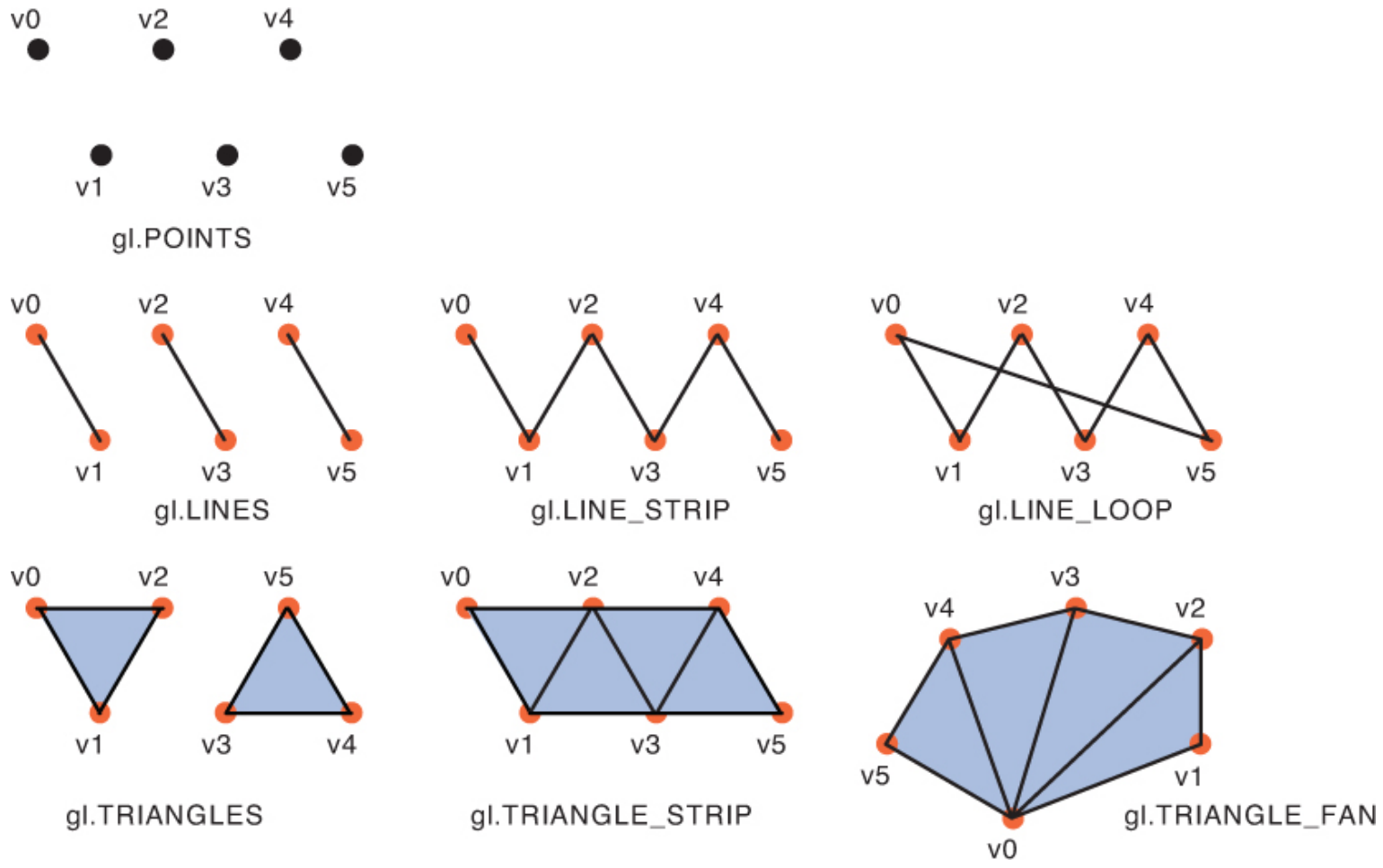
```
noFill();
beginShape();
  vertex(30, 75); // v0
  vertex(40, 20); // v1
  vertex(50, 75); // v2
   ...
endShape();
```



Polygon

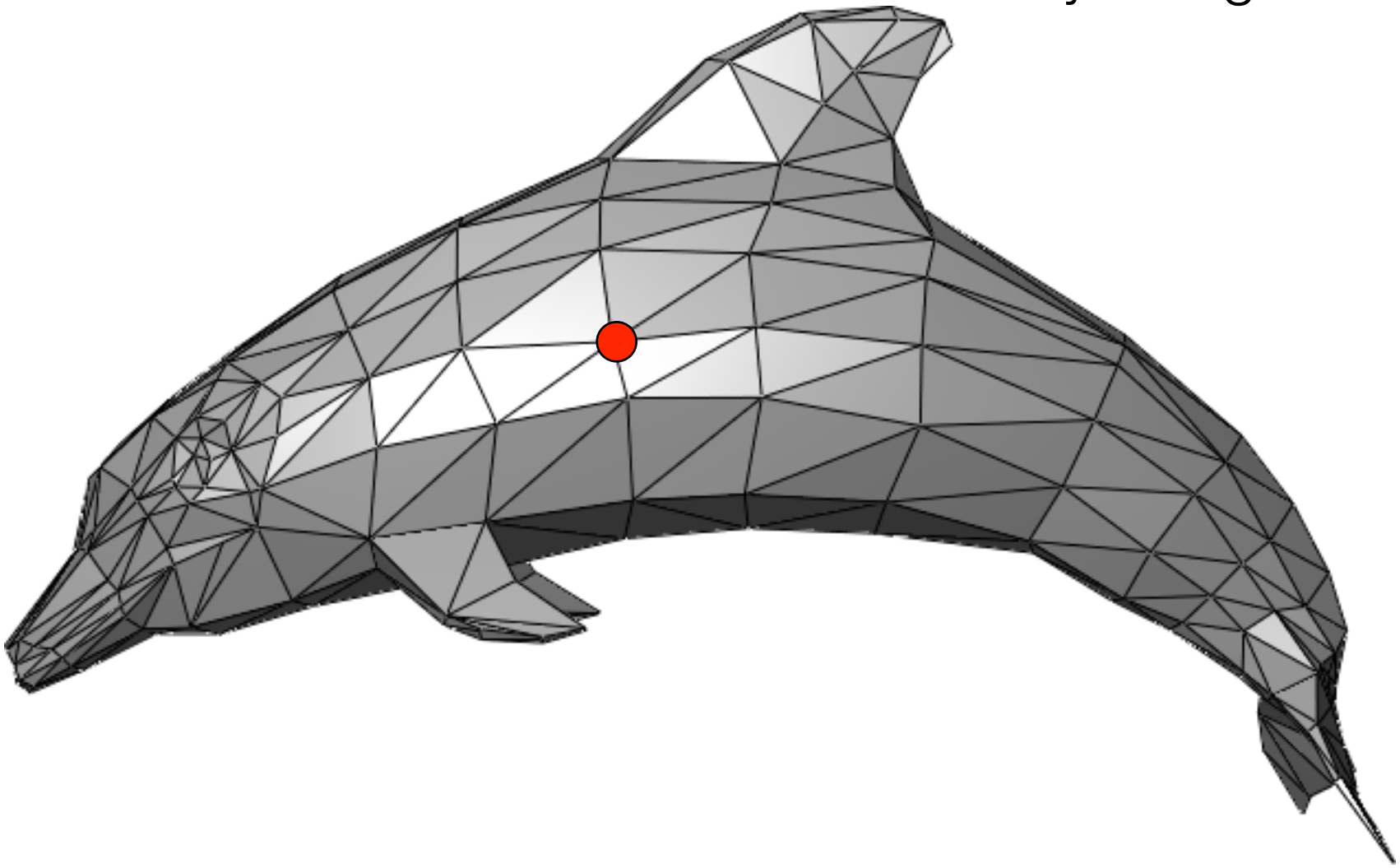
```
fill(255);
beginShape();
  vertex(30, 75); // v0
  vertex(40, 20); // v1
  vertex(50, 75); // v2
   ...
endShape(CLOSE);
```

OpenGL primitives (WebGL version)



Triangle strips and efficiency

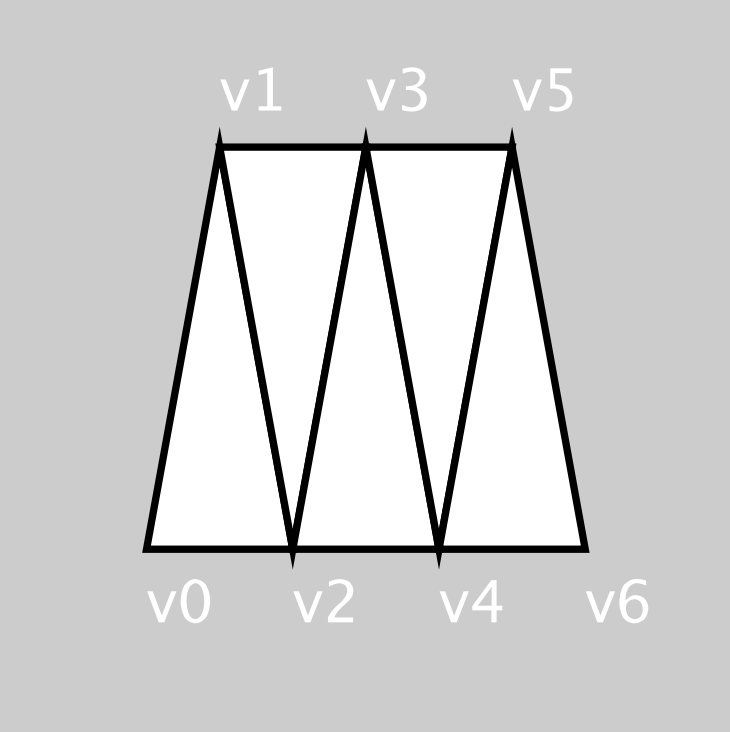
Vertex in red is shared with how many triangles?



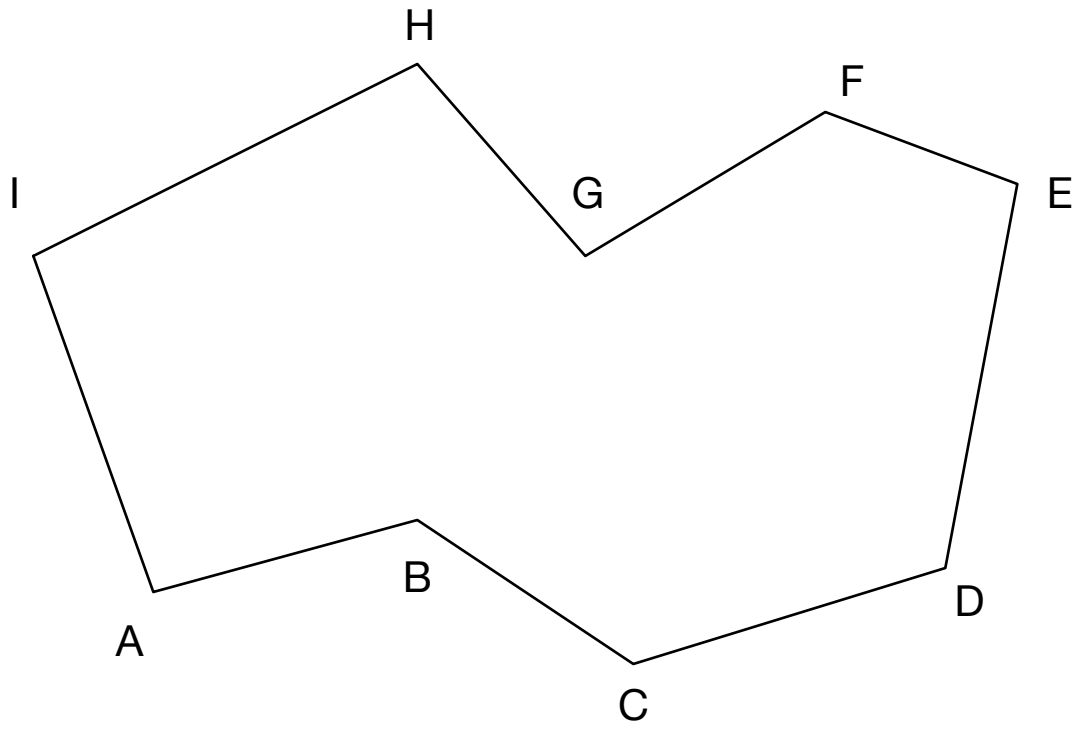
Triangle strips and efficiency

```
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);
```

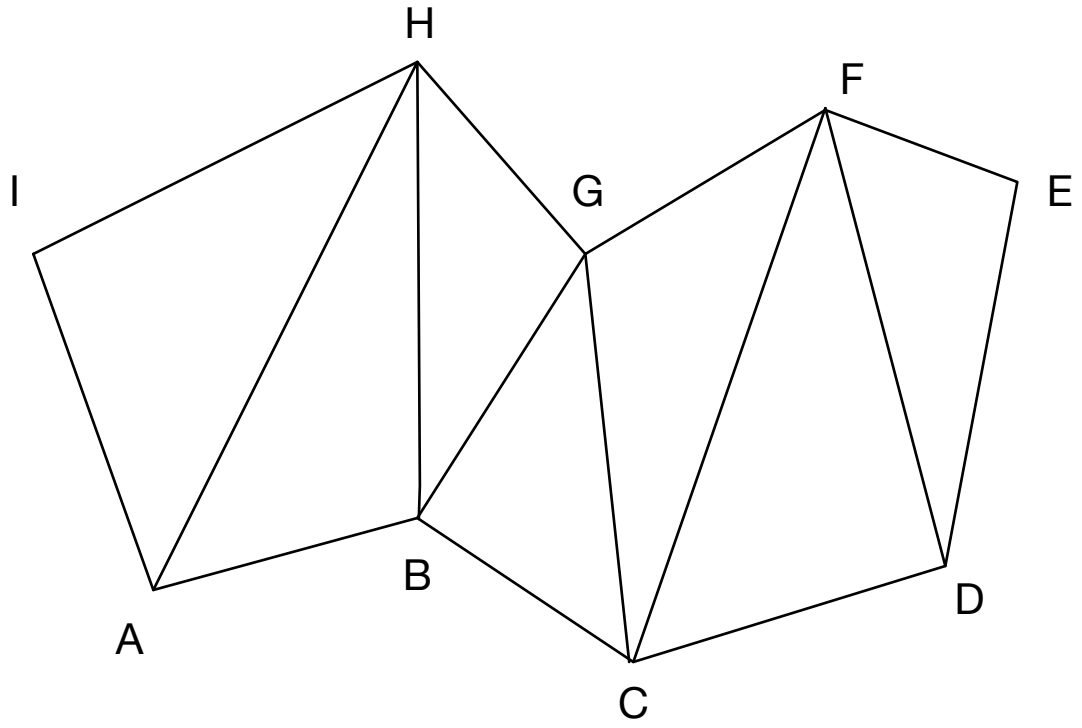
Vertices belonging to multiple triangles not repeated.



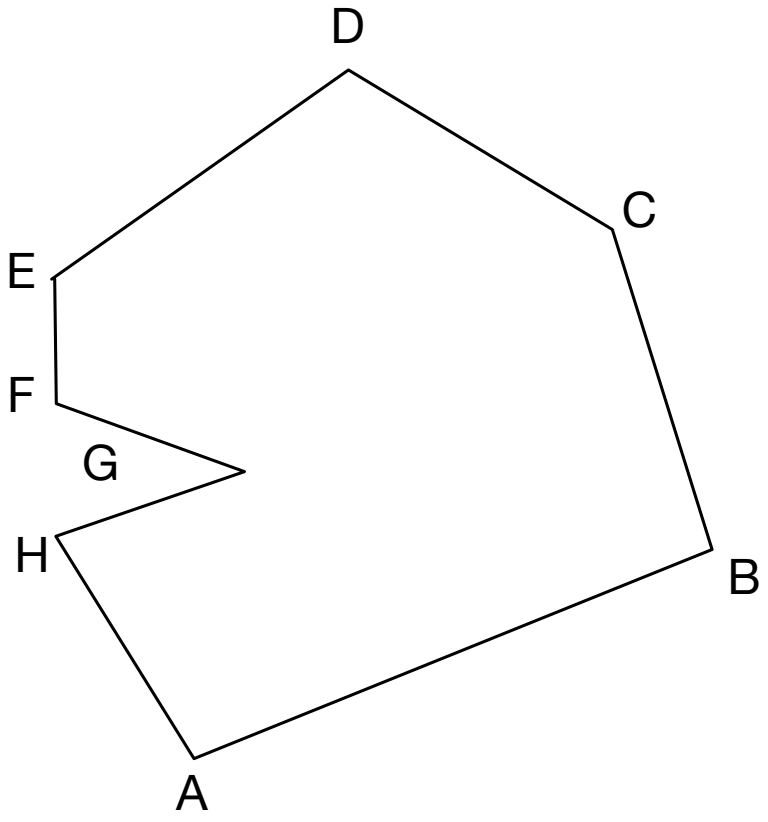
Order of vertices to triangle strip this polygon?



Order of vertices to triangle strip this polygon?



Order of vertices to triangle fan this polygon?



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 TriStripLabeled.pde