Crowdsourcing Marching Cubes

Hank Childs, University of Oregon
Isosurfacing

Quiz: where should the isosurface go?
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This is our last two cells, side by side
Uh oh ... ambiguous case is causing problem
Problem case: ambiguity!!

2D Solution: just pick one and go with it.

3D: nope, that doesn’t work here
Uh oh ... ambiguous case is causing problem
Isosurfacing

Let’s try to make something consistent
Let's try to make something consistent.

Quiz: how many triangles will we need?
Let's try to make something consistent

No! This is got us into trouble before!
Let’s try to make something consistent
Let’s try to make something consistent
Let’s try to make something consistent
From a different angle...
Project 8: What should we do?

• Our choices:
  – Figure out those conventions and reproduce them perfectly
    • Correct and additional effort
  – Ignore the conventions and accept gaps
    • Incorrect, but easier

• Note: ambiguous cases don’t come up a lot in practice
Our hexahedron
How to do this project

• 1) Go to Drive location
  – [https://docs.google.com/document/d/1YCw6vHdgx7YvKuVWneRUpNRsZvMIDxcvhv7___B6n2BU/edit?usp=sharing](https://docs.google.com/document/d/1YCw6vHdgx7YvKuVWneRUpNRsZvMIDxcvhv7___B6n2BU/edit?usp=sharing)
• 2) Search for your name
• 3) Solve your cases (~5 each)
• 4) Update Drive document with answers
Hank’s case: #1

- $1 = 00000001 \rightarrow V2-V8$ are 0, $V1$ is 1
Hank's case: #1
Hank’s case: #1

Edges are at 0, 3, 8
Hank’s case: #1

Why 256?
A: 256 cases

Why 16?
A: 5 triangles max, means 15 vertices
--and -- I want a “-1” at the end to make my code easier

static int lookupTable[256][16] = {
{-1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1}, // 0: Hank
{0, 3, 8, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1},   // 1: Hank

Here are edges 0, 3, 8, which form the three vertices for the triangle

Everything else is left as -1