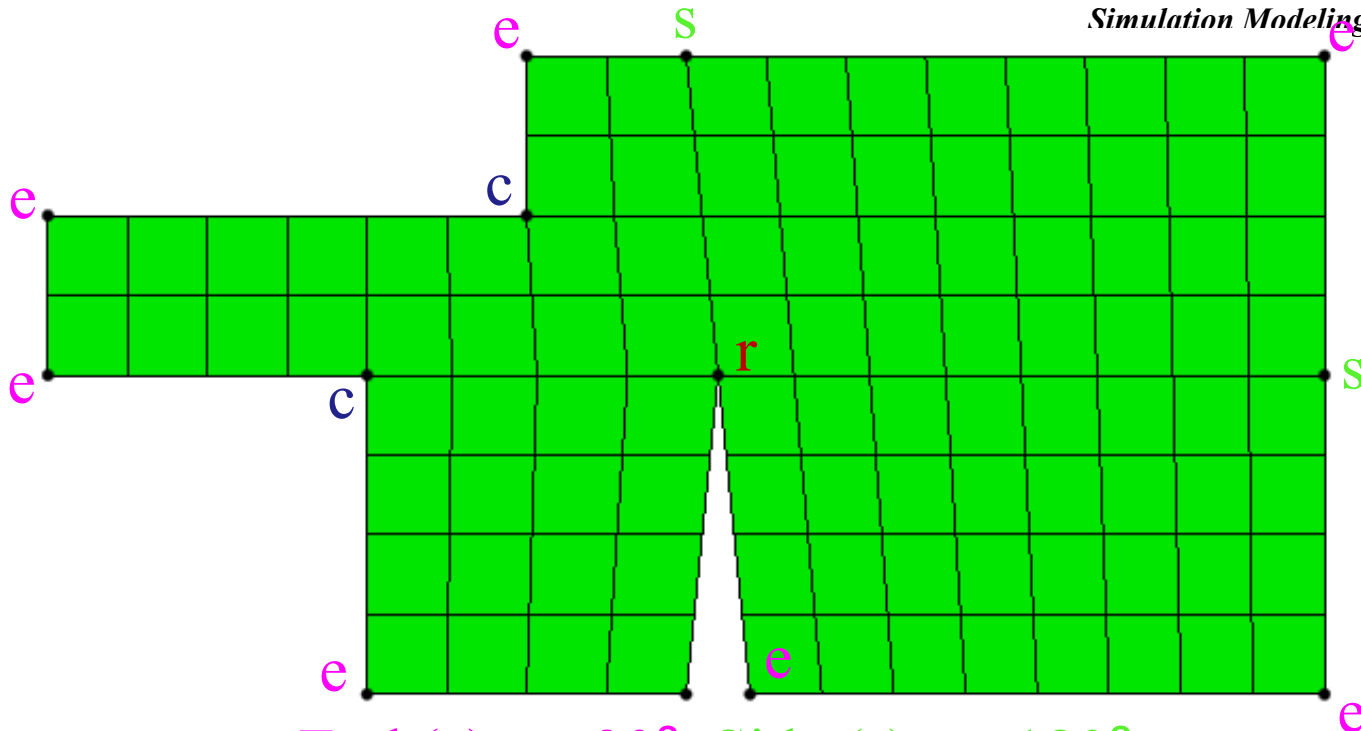


# **CUBIT Fast-Start Tutorial**

## **19. Vertex Types and Sweeping**

# Vertex Types

Simulation Modeling Sciences

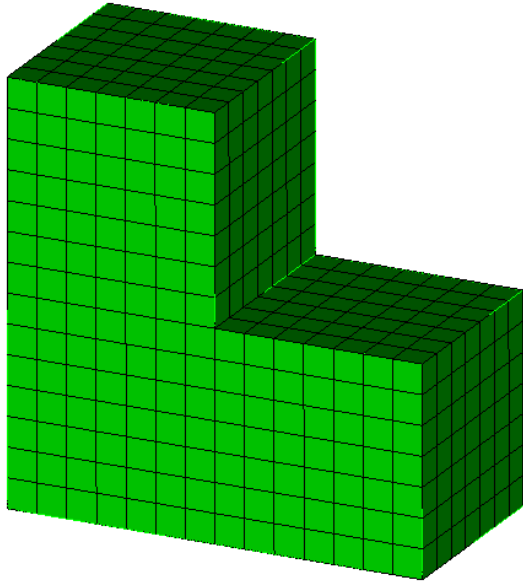


End (e) =  $\sim 90^\circ$ , Side (s) =  $\sim 180^\circ$ ,  
Corner (c) =  $\sim 270^\circ$ , Reversal (r) =  $\sim 360^\circ$

- Vertex types determine how many quads will be around the vertex
- Vertex types help determine the “flow” of a swept mesh (see example 1)
- Types are assigned by comparing the interior angle against vertex type angle ranges
- The user can force specific vertex types even if the angle does not match the specified type

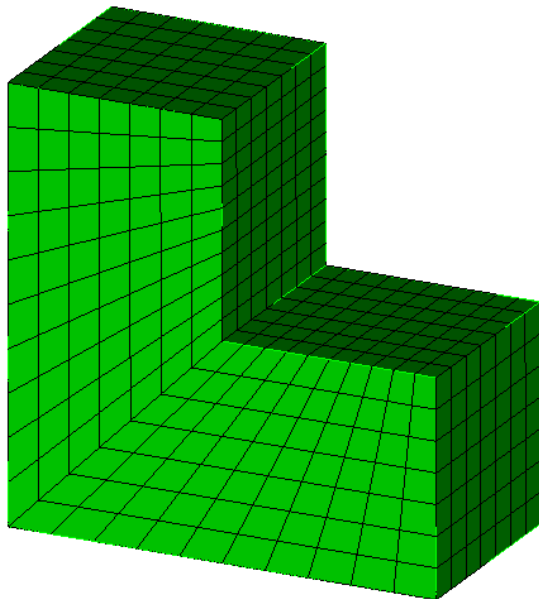
# Example 1: Cubit Automatically Chooses Vertex Types

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Mesh using the default scheme:

```
open "example19_1.cub"  
mesh vol 1  
draw surf 1 vertex type
```



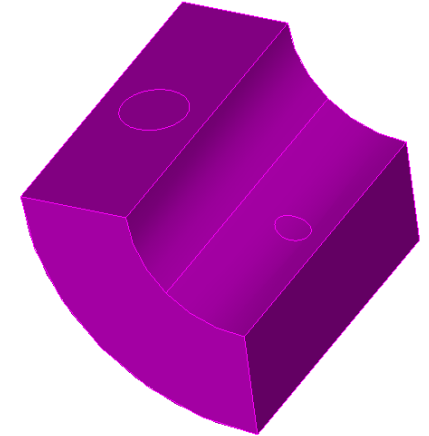
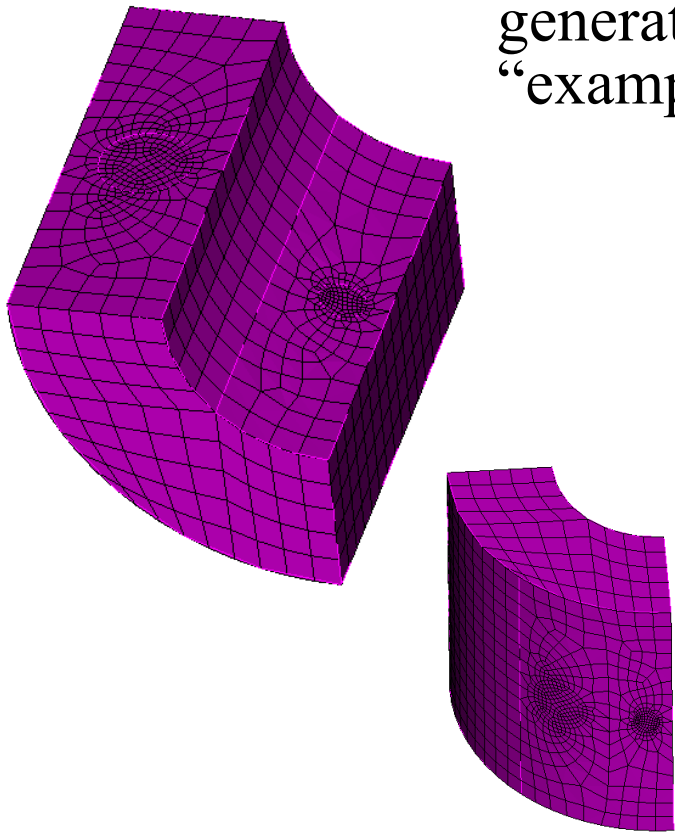
Force a swept mesh:

```
delete mesh  
Reset vol 1  
volume 1 scheme sweep source surface 12 target surface 17  
mesh volume 1  
draw surf 1 vertex type
```

## Example 2: Forcing Vertex Types for Sweeping

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Manually set vertex types to generate the mesh on the left for “example19\_2.cub”.

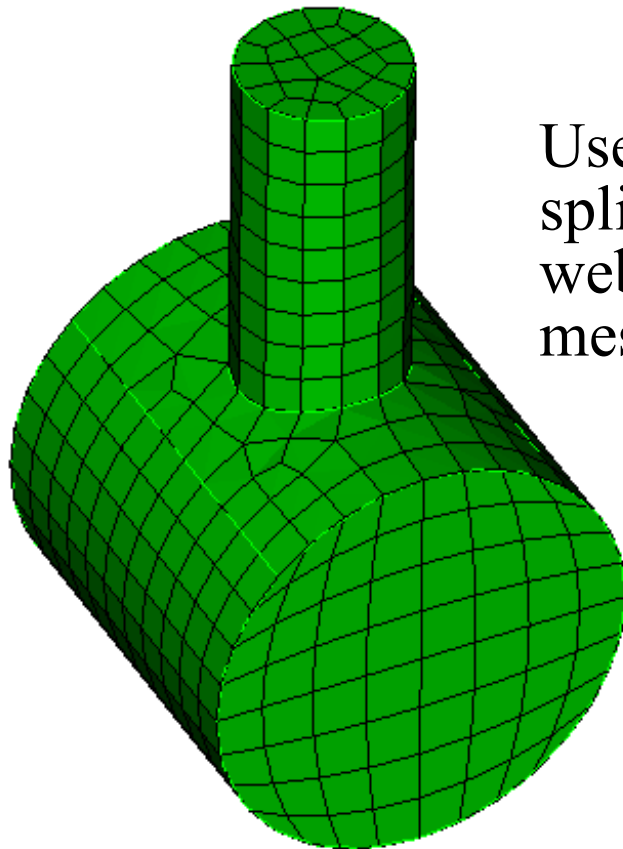


### Hints:

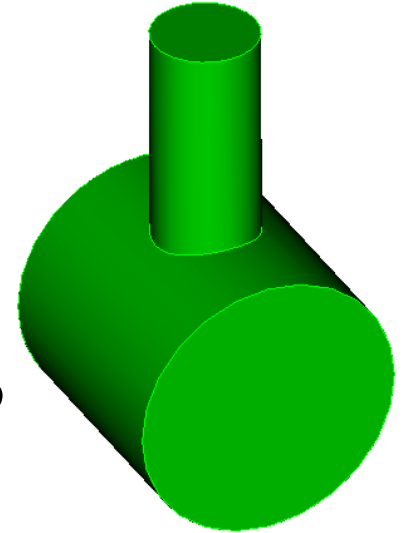
- Use the default mesh size for the volume
- Use a size of .03 and .05 for the small and large circular surfaces respectively
- There are 4 source surfaces and 1 target surface
- Command for setting vertex types is  
“surf <id> vert <id> type <type\_name>”

# Example 3: Using Surface Splits and Vertex Types for Sweeping

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Use only curve splits, surface splits, and setting vertex types (no webcutting!) to generate a hex mesh for “example19\_3.cub”.



# Example 4: Using Vertex Types for Sub-mapping

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Use only manually set vertex types to generate a sub-mapped hex mesh for “example19\_4.cub”.

