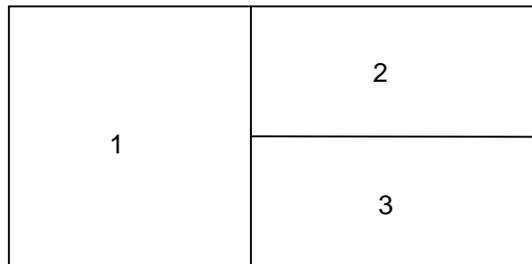


Patch Construction for *VGRID*

Contribution from: S.Pirzadeh, NASA Langley Research Center

Guidelines for Constructing Patches for VGRID:

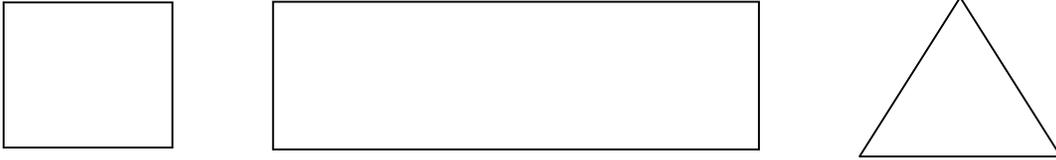
- The projected shapes of the surface patches in 3D should be as close to a square, rectangle, or equilateral triangle, as possible.
- The angles between patch edges should not be too obtuse or too acute ($\sim 60 < \alpha < 120$ degrees).
- The aspect ratio of a patch should not be too high ($\sim < 10:1$).
- At least two of the patch edges should be approximately parallel for 4-sided patches. The patch should be defined in the .d3m file in such a way that one of the parallel edges is listed first. Use [Parallel Side].
- Avoid highly (irregular) curved edges.
- Avoid irregularly shaped patches.
- Avoid edges made of three points.
- “T” intersection of patch edges is acceptable.



- Patches cannot have more than four edges unless they are planar.
- Planar patches with any shape, edge angles, number of edges (more than 1) are acceptable.
- Edges must not contain duplicate points.
- Patch edges must be defined in order.
- The total number of patches is theoretically unlimited, but we probably do not want too many (> 1000).
- The size of a patch must be larger than the local grid spacing. The patch should contain at least a few (4 or 5) triangles in each direction.

- Examples of “Good” and “Bad” Patches for VGRID:

Best Type of Patches:

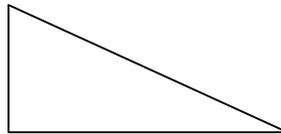


(edges are not necessarily straight in 3D)

Good Patches:

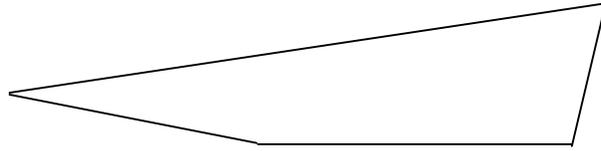


(at least 2 edges are approximately parallel)

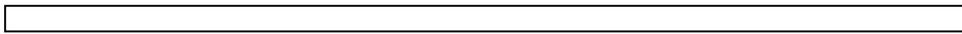


(angles are not too wide/acute)

Bad Patches:

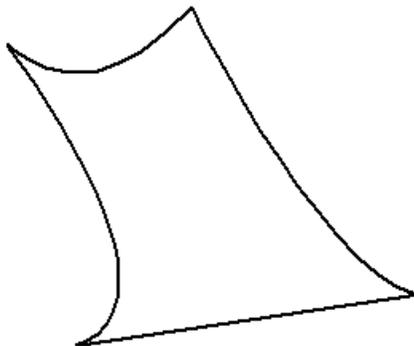


(angles are too wide/acute, none of the edges are parallel)



(aspect ratio too high)

Very Bad:



(arbitrary shapes with highly curved edges)

Notes:

- 1) Assume the patches shown are all 3D and projected onto a plane.
- 2) For planar patches, all of the above patches are acceptable.