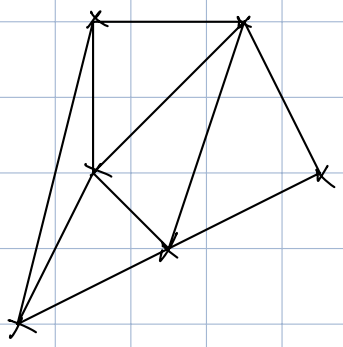
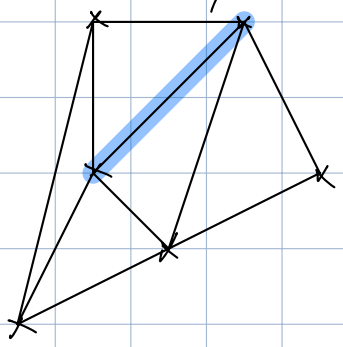
SPLIT

0. Base



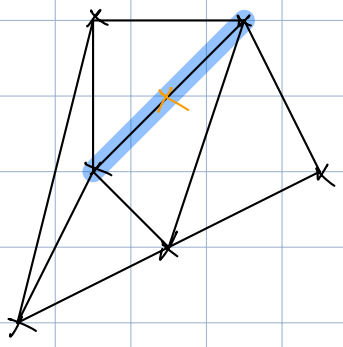
Splitting an edge is the process of dividing an existing edge into two parts. This can be done by inserting a new vertex into the middle of an edge, then updating the mesh topology to connect iwth it appropriatly

1. Identify



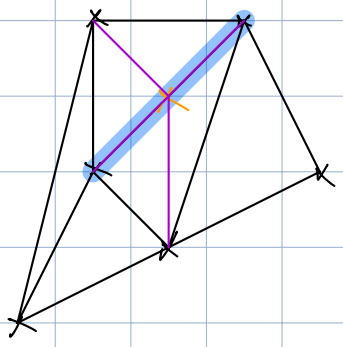
Identify the edge you want to split.

2. Insert



Create a new vertex along the edge you want to split. The vertex is commonly placed at the midpoint of the edge, but it can be placed anywhere along the edge depending on optimization requirements.

3. Retriangulate

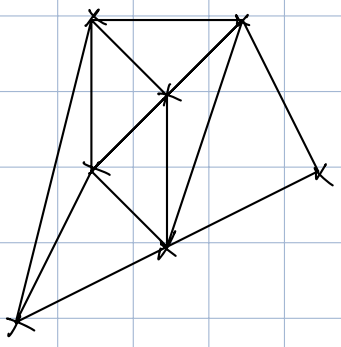


Now, split the original edge into two new edges. The new edges will each connect one of the original edge's vertices with the new vertex.

Update the faces that were adjacent to the original edge. In a triangle mesh, this will be two triangles, or one if the split edge was an outer edge. Each original triangular face is split into two faces, consisting of one vertex of the original edge, the vertex unrelated to the original edge, and the inserted vertex.

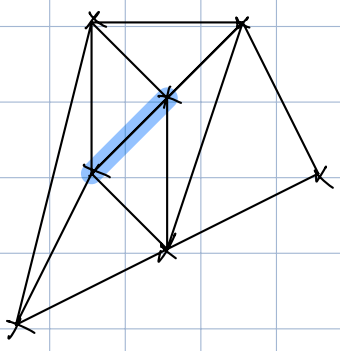
COLLAPSE

0. Base



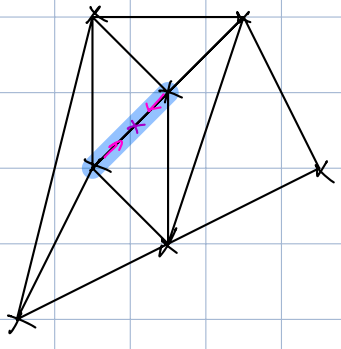
The process of edge collapse refers to the merging of two vertices of a mesh into one, reducing the number of verts, edges and faces in the mesh. It is essentially the opposite operation of edge splitting.

1. Select Edge



Select the edge you want to collapse.

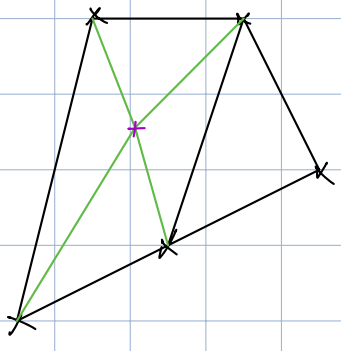
2. Unify verts



Unify the two vertices of the edge. this can be done in several ways. For example, one vertex can simply be moved to the position of the other. In this illustration, I chose to remove one vertex, and move the other to the midpoint of the edge that connected them.

The original edge has now become a point.

3. Update edges & faces



Update the edges and faces that were connected to the removed vertex to now connect to the kept (and moved) vertex. If this results in any degenerate faces (like a triangle with two identical vertices), remove those as well.