The figure above depicts a halfedge mesh with boundary. Dark blue regions indicate interior faces, whereas light blue regions indicate virtual boundary faces. In the HalfedgeMesh data structure, a mesh element is considered to be part of the boundary if it is contained entirely in a boundary face. For instance, in the figure above the region b is a virtual boundary face, which means that vertex v', edge e', and halfedge h' are all part of the boundary; their isBoundary() methods will return true. In contrast, vertex v, edge e, face f, and halfedge h are not part of the boundary, and their isBoundary() methods will return false. Notice also that the boundary face b is not a triangle: it has 12 edges.

Importantly, the edge degree and face degree of a boundary vertex is not the same. Notice, for instance, that vertex v' is contained in three edges but only two interior faces. By convention, Vertex::degree() returns the face degree, not the edge degree. The edge degree can be computed by finding the face degree, and adding 1 if the vertex is a boundary vertex.