→ **Vertex Objects:**

vertex object for vertex v storing element x has instance variables for:

- → a reference to element x to support element()
- → a reference to the position of vertex instance in the list V, thereby allowing v to be efficiently removed from V if it were removed from the graph

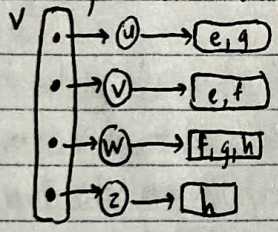
→ **Edge Objects:**

edge object for an edge e storing element x has instance variables for:

- → a reference to element x, to support element()
- → references to vertex objects associated w/ the endpoint vertices of e. These allow the edge instance to provide constant-time support for endpoints() and opposite(v)
- → a reference to the position of the edge instance list E, thereby allowing e to be efficiently removed from E if it were removed from the graph

→ **Adjacency List:**

- groups the edges of a graph by storing them in smaller secondary containers associated w/ each individual vertex
- for each vertex v, maintain collection I(v), called incidence collection of v, whose entries are edges incident to v



Adjacency Map Example