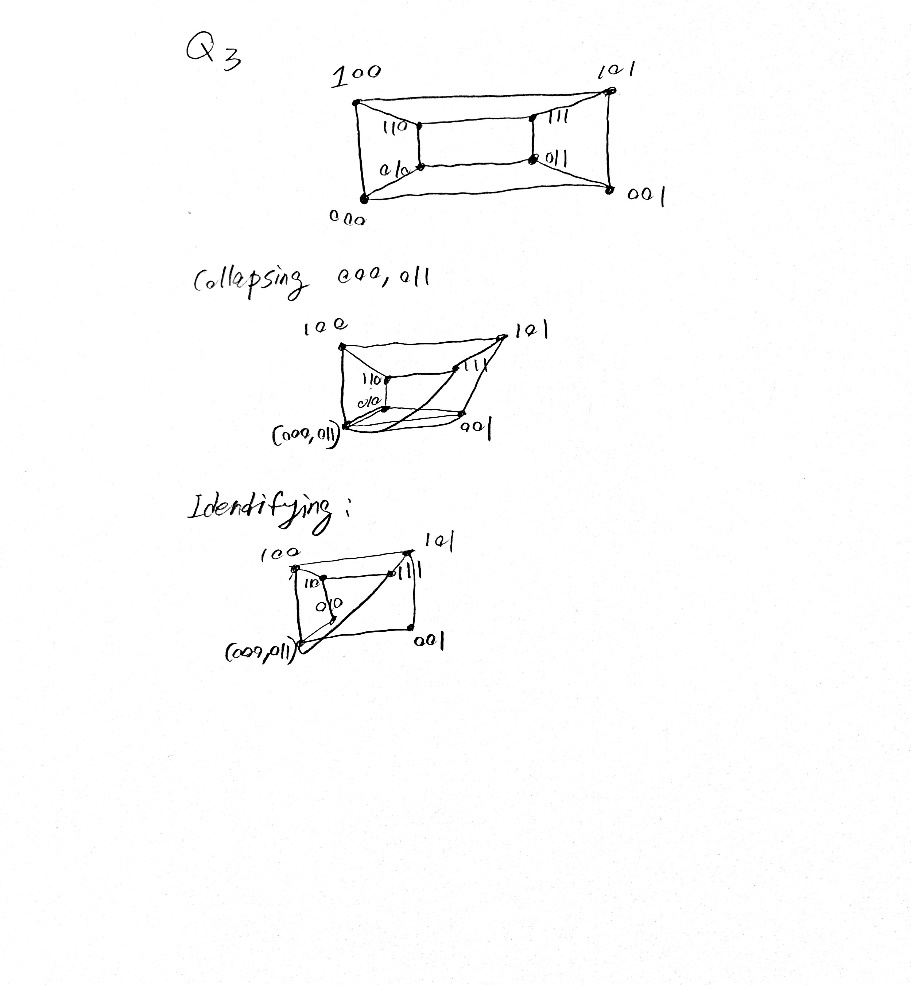
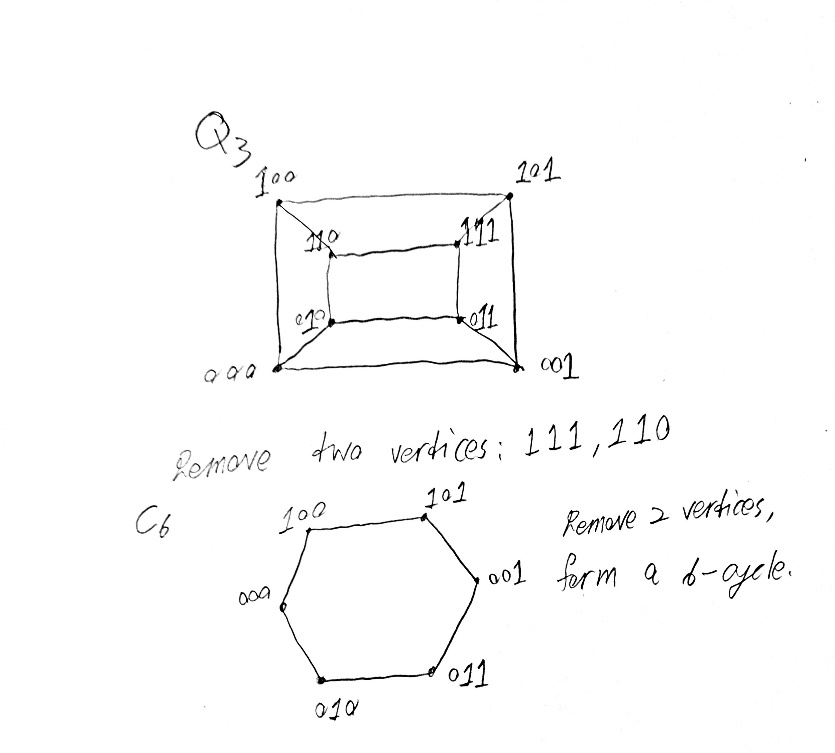
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CS 453

* 1. The number of
  2. To prove that is a 4-regular graph, we need to show that for any vertex (a, b) of the graph , (a, b) is adjacent to exactly other four vertices. For two vertices (a, b) and (c, d) be adjacent in , either , or . Since the is a cycle, it is a 2-regular graph, and each vertex is adjacent to vertices next to it. For , each vertex in is adjacent to the vertices which the corresponding vertex in is adjacent to, which is another 2 vertices. Therefore, is a 4-regular graph for n≥3
  3. Number of edges in , and number of edges of
  4. Assume , then ). }. So for there are m edges from and n edges from . Therefore, G\*H is a (n+m)-regular graph.
  5. 

W has 4-degree.

* 1. Since W has a length of k and W’ has a length of k+1, for any k ≥ 1, it means that W’ always has one more vertex connects in the walk than W, which means the graph contains loop or cycle. Therefore, G can not have a longest walk.
  2. A path is a walk does not repeat a vertex. Therefore, if W is a walk in the graph G has length of k, which is larger than b the upper bound length of path in G, it means W must contains one or more repeated nodes since the path does not contain repeat nodes and b is the length of walk that does not contain repeat nodes.