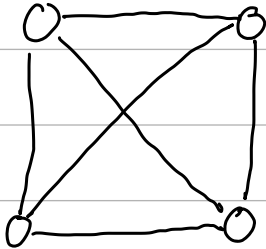


Lecture 25

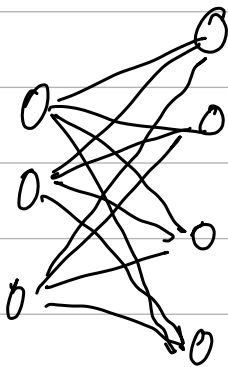
Graphs or Networks

K_4 :



Number of edges in K_4 is $\binom{4}{2}$

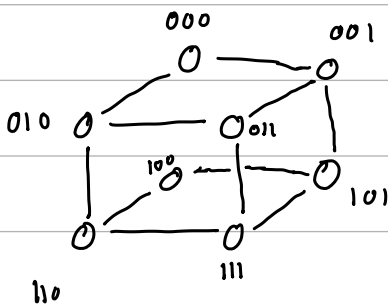
$K_{3,4}$



K_{nm} has (nm) edges

so $K_{3,4}$ has 12 edges.

- For a hypercube draw an edge between nodes that differ by one bit.



- When a graph contains a complete graph as a subgraph, that subgraph is called "clique"

- The largest clique determines the clique number

- Two simple graphs $G_1(V_1, E_1)$, $G_2(V_2, E_2)$ are isomorphic, if there exists a bijective function $f: V_1 \rightarrow V_2$ such that

look at slides to see the function.

- To prove isomorphism you must present a bijection.

- Cut edge: An edge such that if you remove it then the graph becomes disconnected

- Cut node: A node such that if you remove it and any incident edges, then the graph becomes disconnected.

✱ If G is planar \rightarrow Euler's Identity holds ($|V| - |E| + |R| = 2$)
the inverse (flip the two) is not true!!!!

- A coloring of a graph is valid if no adjacent nodes have the same color.

- In any graph, the chromatic number \geq clique number

min number of
colors needed
in a valid
coloring