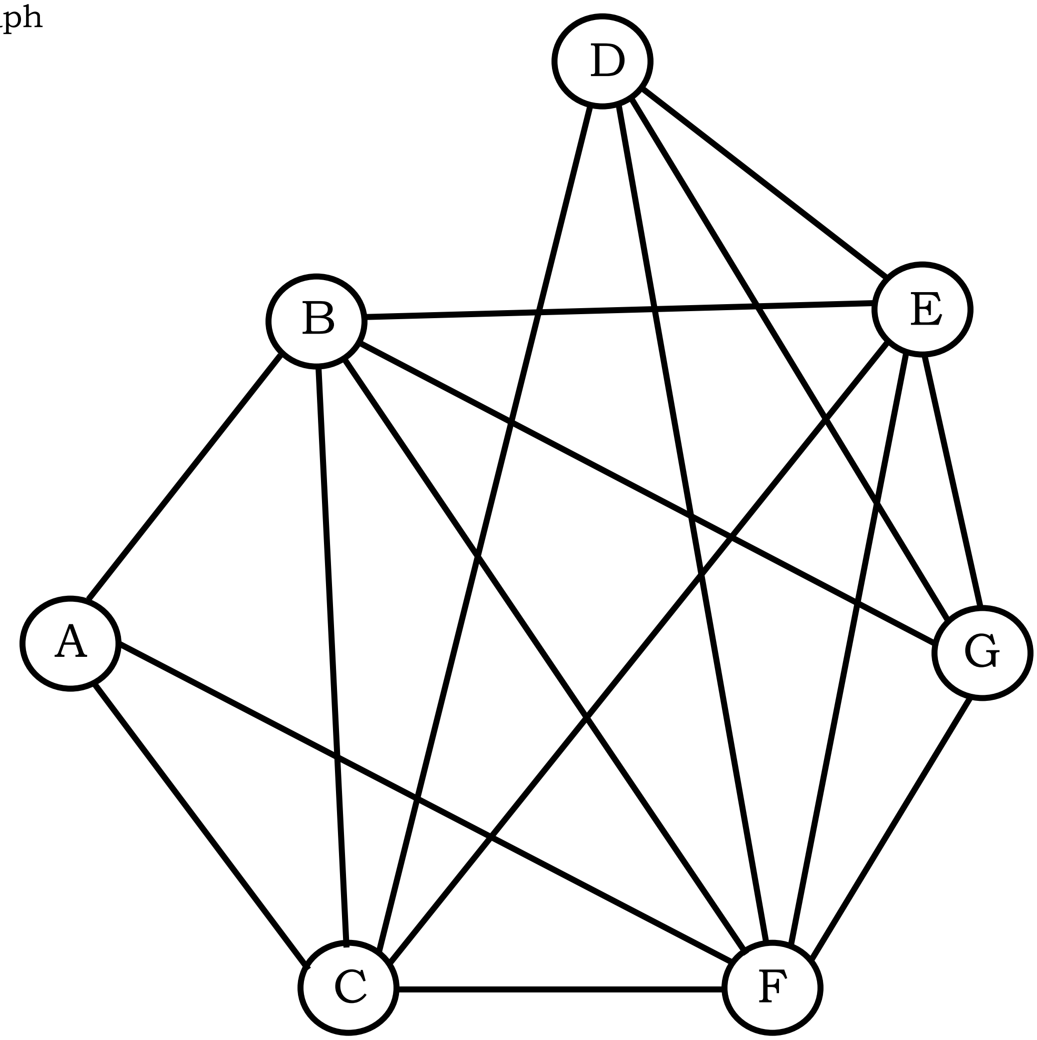
A graph

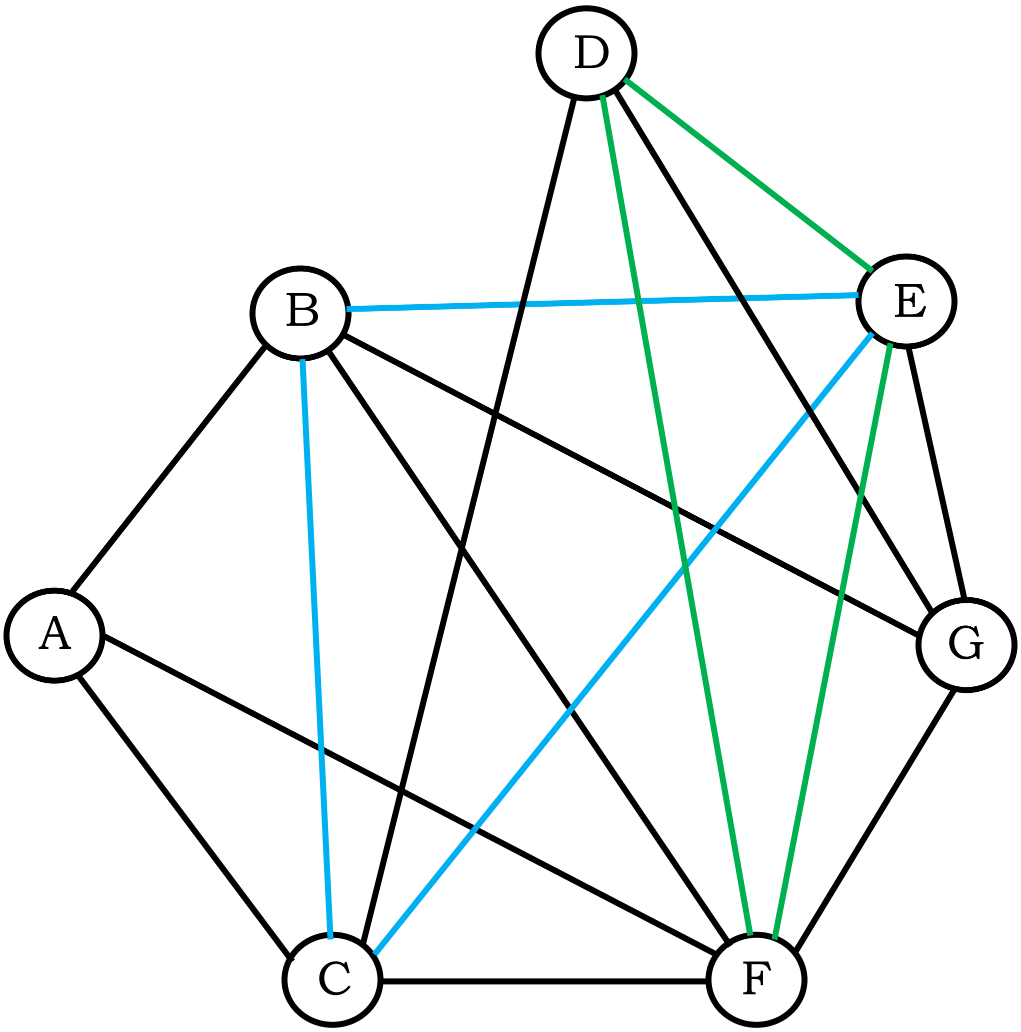


N = 7 nodes / vertices

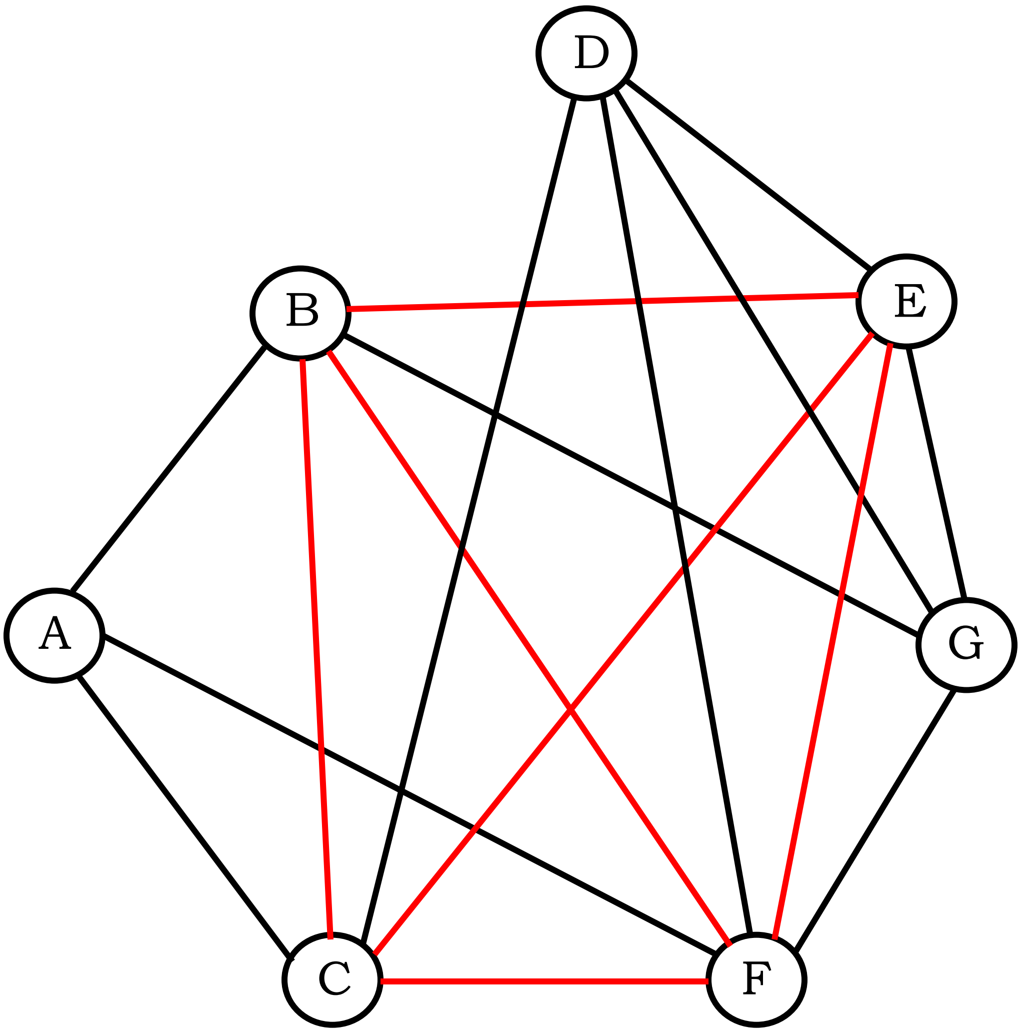
{ A, B, C, D, E, F, G }

E = 15 edges / arcs

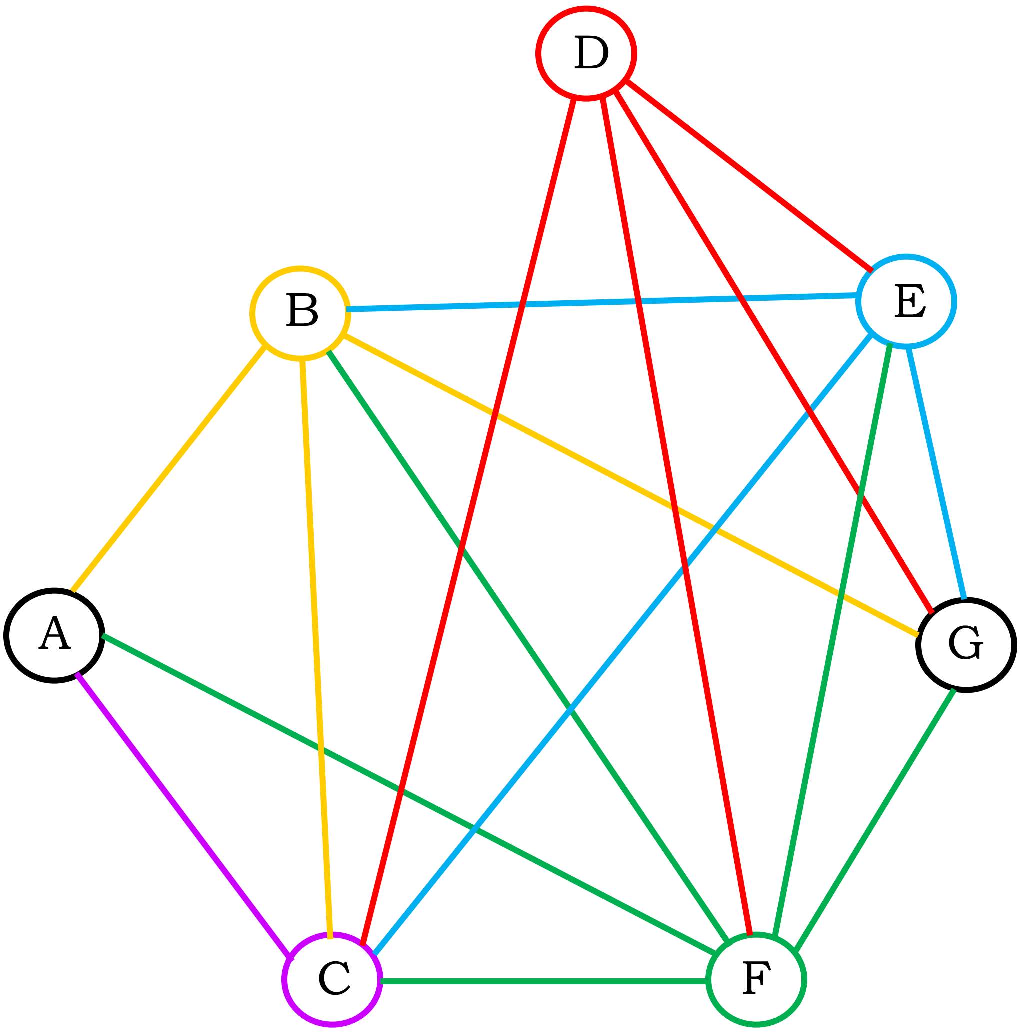
{ (A, B), (A, C), (A, F), (B, C), (B, E), (B, F), (B, G), (C, D), (C, F), (D, E), (D, F), (D, G), (E, F), (E, G), (F, G) }



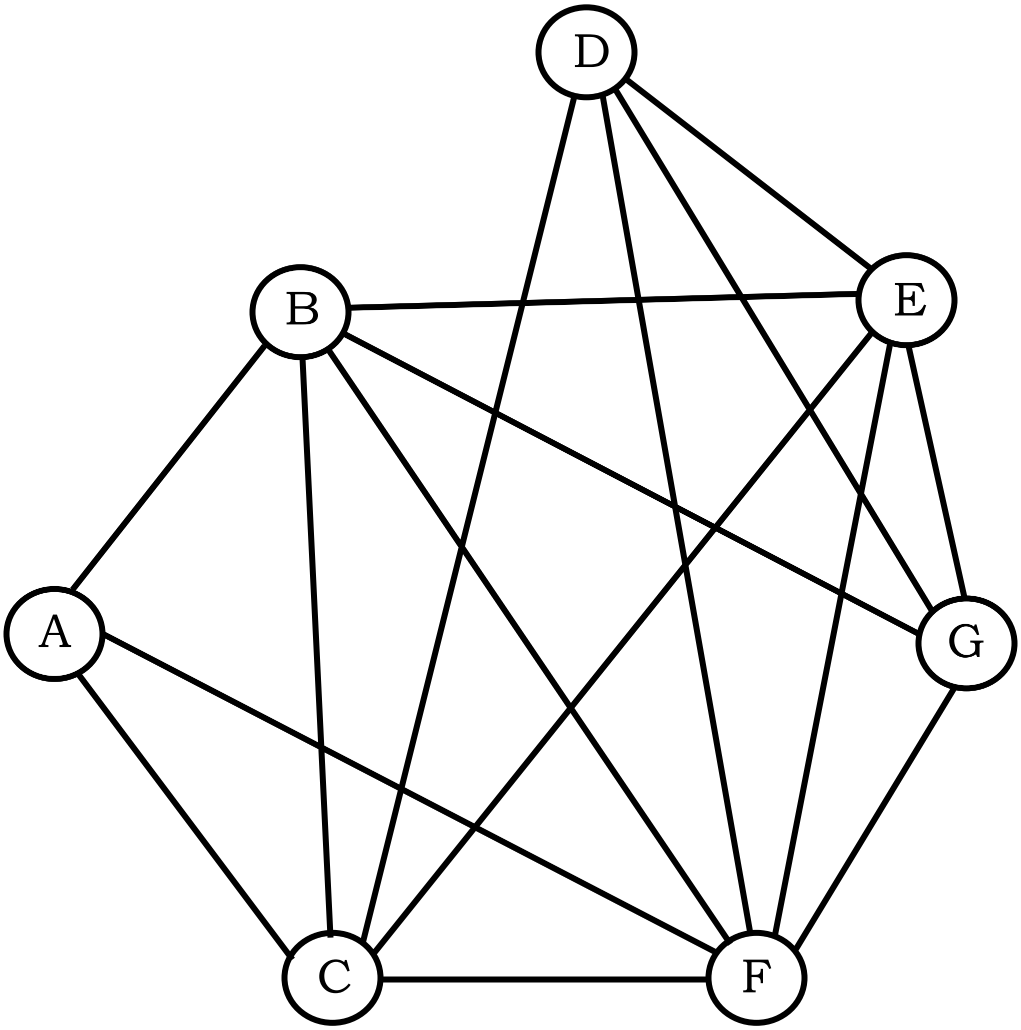
{ B, C, E } and { D, E, F } are 3-cliques, and there are many others



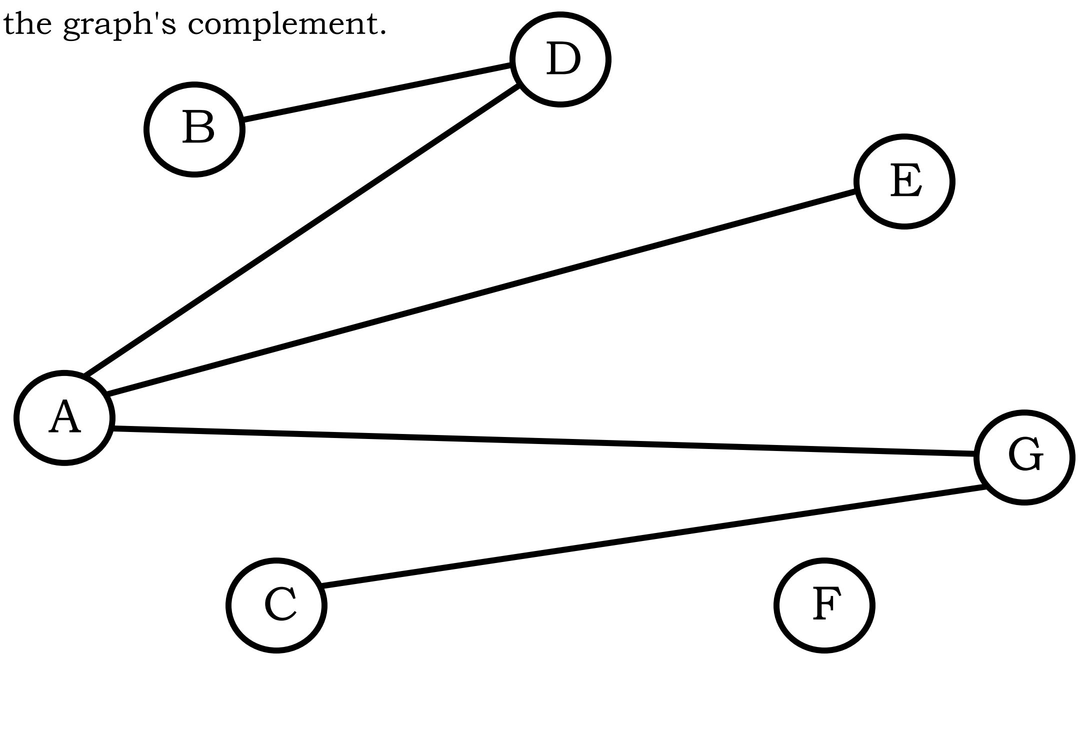
{ B, C, E, F } is a 4-clique, there are no other 4- or higher cliques



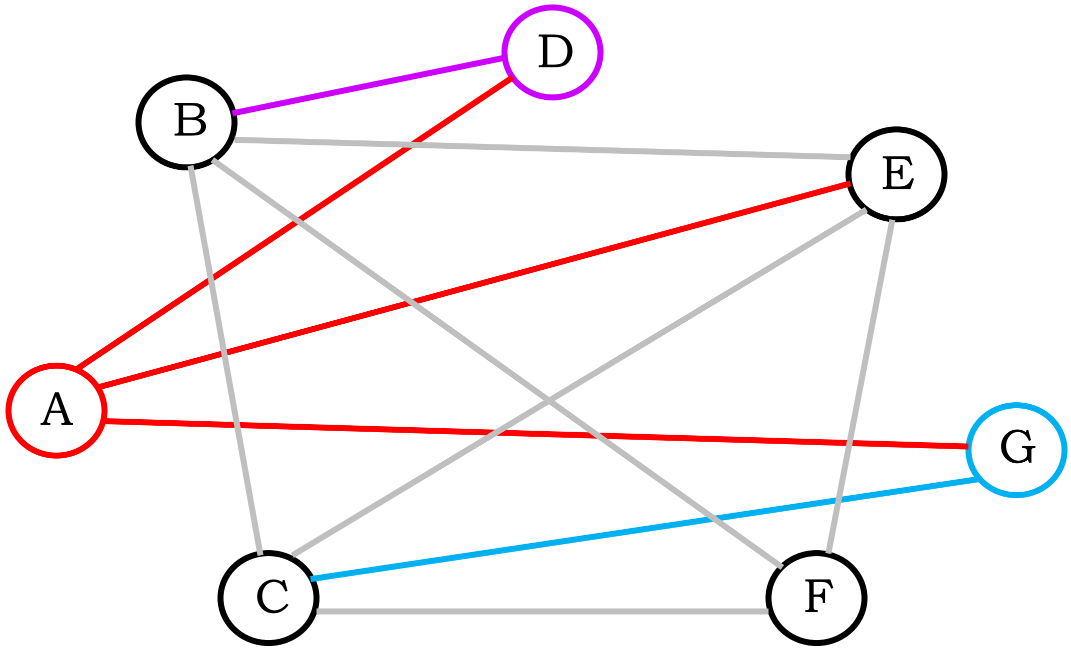
{ B, C, D, E, F } is a vertex cover for this graph.



This is the graph's complement.



If a graph G with nodes V, where N = #V, has a clique V^C of size N^C, then V - V^C is a vertex cover (of size N - N^C) of the complement of G.



(x, y) is any edge in the complement of G:
(x, y) is not in G, by definition.
therefore at least on of x and y is not in the clique
(if x and y were both in the clique then (x, y) would have to be in G)
therefore at least on of x and y must be in V - V^C
therefore V - V^C is a vertex cover of the complement of G.

(x, y) is any edge in the complement of G
and C is any vertex cover of the complement of G:
x is in C, or y is in C, or both.
therefore for all x and y in V,
if x is not in C and y is not in C
(if they are in V but not C they must be in V - C)
then (x, y) is in G
therefore V - C is a clique.