Eclipse, Kliezl P. Exercise 3.4 – 7

Q: Consider the ***clique problem***: given a graph *G* and a positive integer *k*, determine whether the graph contains a ***clique*** of size k, i.e., a complete subgraph of *k* vertices. Design an exhaustive-search algorithm for this problem.

A:

// Input: positive integer *k*
// Output: **true** if the graph does contain a clique of size k, otherwise **false**
Let *v* be the number of vertices of graph G
if *k* is less than or equal to *v*
    while there are still possible subsets of *k* vertices in G, **do**
        get a subset of *k* vertices in G
        check if every pair of vertices in the subset is joined by an edge in G
            if all pairs of vertices in the subset are joined by an edge
                return true
    if all possible subsets are checked
        return false
else return false (there is no clique of size *k* in graph G if a graph has lesser number of vertices than *k*)