Jazz or Classical?

You want to invite friends to a concert but are unsure whether to invite them to *jazz* or *classical*, which are the only two genres you like. Through a small music network, you have a good overview of your own musical taste, the musical tastes of your friends, your friends' friends, your friends' friends' friends, etc. The musical taste of a friend (or a friend's friend, etc.) v is given by a dictionary M, where $M[v]$ is a set of genres. For example, $M[v]$ might be $\{\texttt{"jazz"}, \texttt{"pop"}, \texttt{"folk"}\}$.

(a) How can you represent the music network as a graph? What do the nodes and edges represent in the graph?

Although you want to bring as many people as possible to the concert, there is a limit to how peripheral you want your friends to be. You set a limit k which indicates how many levels of friends you are willing to go through. For example, if $k = 1$, you will only invite your own friends. If $k = 2$, you will invite your own friends and their friends.

(b) Write an algorithm that takes a graph $G = (V, E)$, a dictionary M, a start node $s \in V$, and a positive integer k as input. It should return `"jazz"` or `"classical"` depending on which genre most people like within k levels of friends. You can assume that the number of people who like jazz and classical is not the same.

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Input: A graph G = (V, E), a dictionary M, a start node s ∈ V, and an integer k
Output: A string "jazz" or "klassisk"
1 Procedure JazzOrClassical(G, M, s, k)
  |   // ···
```

(c) Now you want to send out invitations. You want to *first* invite your own friends, *then* your friends' friends, and so on. Which algorithm, known from the curriculum, is suitable for sending out invitations in this way?