

For these problems, be clear what graph model you wish to use and what graph problem needs to be solved. Please comment on assumptions, possible solution strategies, etc. Since I haven't given you data, I don't expect an actual optimal solution.

1. You are in charge of the Pacific Spirit Park trails. There has been a big storm and you wish to clear the trails of fallen logs, if any. What is an optimal strategy to check all the trails by traversing the minimum distance.
2. The lots in a subdivision have all been laid out. You wish to build houses so that no two neighbouring houses have the same basic design (here we mean neighbouring to mean next door or across the street). How many different designs do you need?
3. You are teaching some boisterous first graders. You wish to assign them buddies to sit next to (the class have even size and the desks have been arranged in pairs!) so that you don't assign two children/hooligans to be buddies if the last time you put them together, they caused trouble. How should you do this?
4. You are given a map locating all the maple trees in VanDusen Gardens. You need to inspect them all to check for winter kill and mark damaged trees for replacement or special pruning. How should you proceed to visit the trees at minimum effort.
5. You are given the problem of inspecting boulevard trees in a certain neighbourhood in Vancouver. How should you proceed to visit the trees at minimum effort. What is the difference from the problem 4 above.
6. You are elected to office in a poor district by promising that the townsfolk will be able to drive on paved roads when needing to travel from one town to another. How can you fulfil this promise at minimal cost given the map of available roads and knowledge of which ones are currently paved as opposed to being gravel or dirt roads. Remember that you are a politician.
7. You are a developer for a condominium complex of 120 units and 180 parking spaces. The parking is in various lots surrounded by lovely landscaped berms. Each condominium is to be given title to either one or two parking spaces (depending on the size of the unit, it is fixed for a given unit) where the sum of the required spaces will be less than or equal to 180. How should you do the allocation to create the most convenience by having condominiums close to their allocated parking spaces? (the problem seems simpler if only one parking space is to be allocated per unit)