CS 340 202030

Lecture 1: September 02, 2020.

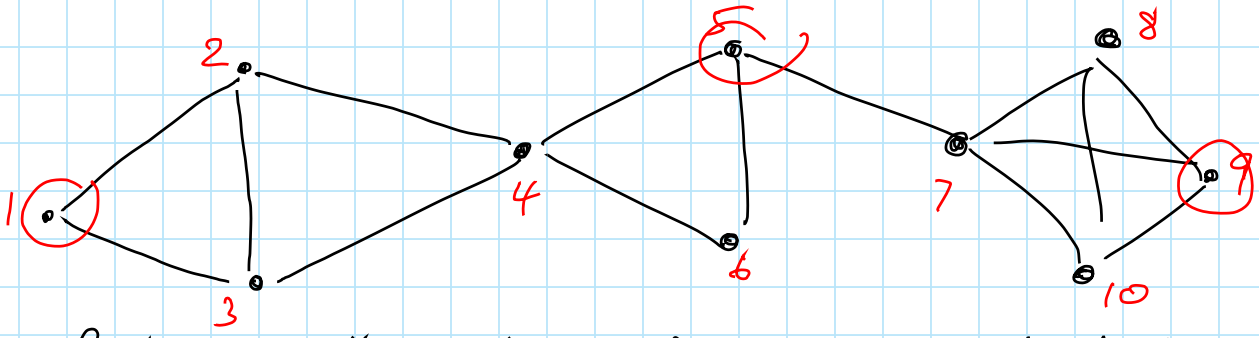
0. INTRODUCTION

algorithm: procedure, defined by a sequence of computational steps, producing output values from given input values.

purpose: solving a computational problem

EXAMPLE 1. placing dispatchers

given: n locations in a network
two locations are connected if, say, their distance is below a certain threshold



goal: find a smallest set L of locations such that every remaining location is directly connected to at least one location in L

a simple algorithm:

Stage i, $1 \le i \le n-1$: Check all sets containing exactly i dispatchers. As soon as a solution is found, return it. If no solution at this stage is found,

Stage n: return the full set of all locations.

Problem: this algorithm may take exponential time in n ($\Theta(2^n)$)