Week 1

Algorithms on Graphs

Week 1

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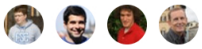
Decomposition of Graphs 1



Graphs arise in various real-world situations as there are road networks, computer networks and, most recently, social networks! If you're looking for the fastest time to get to work, cheapest way to connect set of computers into a network or efficient algorithm to automatically find communities and opinion leaders hot in Facebook, you're going to work with graphs and algorithms on graphs. In this module, you will learn ways to represent a graph as well as basic algorithms for decomposing graphs into parts. In the programming assignment of this module, you will apply the algorithms that you've learned to implement efficient programs for exploring mazes, analyzing Computer Science curriculum, and analyzing road networks. In the first week of the module, we focus on undirected graphs.

Less

Learning Objectives

- Explain what a graph is
- Create a program for exploring mazes

Less

Welcome

Reading: About University 10 min

Pre-survey on HSE online courses 4 min Resume

Reading: Welcome 10 min

Reading: Rules on the academic integrity in the course 10 min

Graph Basics

Video: Graph Basics 4 min

Video: Representing Graphs 9 min

Reading: Slides and External References 10 min

Exploring Undirected Graphs

Video: Exploring Graphs 14 min

Video: Connectivity 5 min

Video: Previsit and Postvisit Orderings 7 min

Reading: Slides and External References 10 min

Programming Assignment

Programming Assignment: Programming Assignment 1: Decomposition of Graphs 3h Due Aug 9, 1:59 AM CDT