1. Introduction

Social Network Analysis

1. Quiz: Magic Trick

Pass over all movies exactly once.

Must end at KB, learned this in MAT 394 Topic: Algorithmic Graph Theory at ASU.

For fun though.

MS -> RD -> DH -> SS -> JR -> DH -> KB -> JR -> AH -> MS -> KB

Social Networks are connections between individuals that capture relationships between them. Algorithms are how we organize computations to solve a particular problem.

Graph with nodes, edges between them. DH degree 4, KB and MS are the only two odd nodes, so you must start and end on them in order to fully traverse the graph.

1. Quiz: Eulerian Path

Eulerian Path = An undirected, connected graph has an Eulerian path if and only if it has either 0 or 2 vertices of odd degree.

Yes, all such graphs do.

Eulerian Tour!

1. Algorithms Are Cool

* Really useful
* Really clever mathematically

How to make a program fly?

* Careful program design
* Tweaking loops
* Good algorithm design

1. Quiz: Case Study

Need for Mathematics

Theory Stuff (Math) helps

1. Formalize what you are doing
2. Analyze correctness
3. Analyze efficiency – time, memory, power
4. Correctness: Naïve

Just multiplies a \* b.

1. Quiz: Running Time
2. Quiz: Russian Peasants Algorithm
3. Example
4. Correctness: Russian
5. Quiz: How Many Additions
6. Which Is Faster
7. Quiz: Measuring Time
8. Quiz: Counting Steps
9. Quiz: Steps For Naive
10. Quiz: Halving
11. Steps For Russian
12. Divide And Conquer
13. Quiz: Recurrence Relation