Advanced Algorithms

- Students will be able to:
- define computation and some basic ideas of the theory of computation
- discuss computability and understand there are some things computers cannot solve
- explain the Halting Problem
- identify some advanced search algorithms
- understand how AI programs represent games with game trees
- understand how AI programs use uninformed and heuristic search algorithms to play games

Journal

Given y = 7x + 4 and x=3 what are the steps to find y?

Given y = 7x + 4 and y=3 what are the steps to find x?

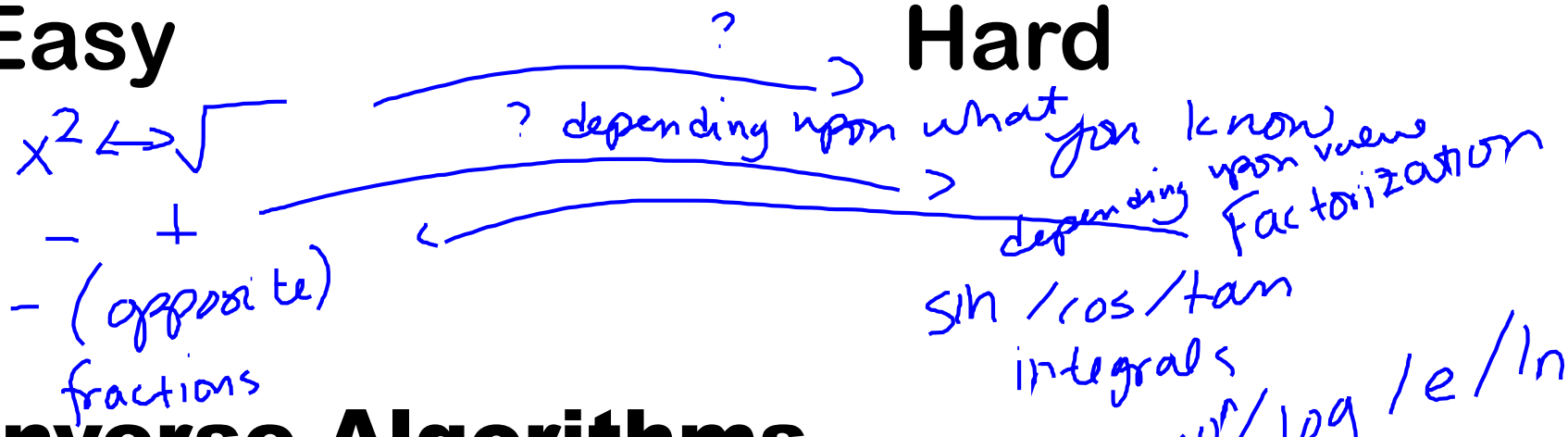
Factor 81,927,497 and 81,927,499. Can you figure out the steps?

Multiply 431 x 433 x 439. What are the steps?

Inverse Operations

mod = remainder
%

Easy ? Hard



Inverse Algorithms

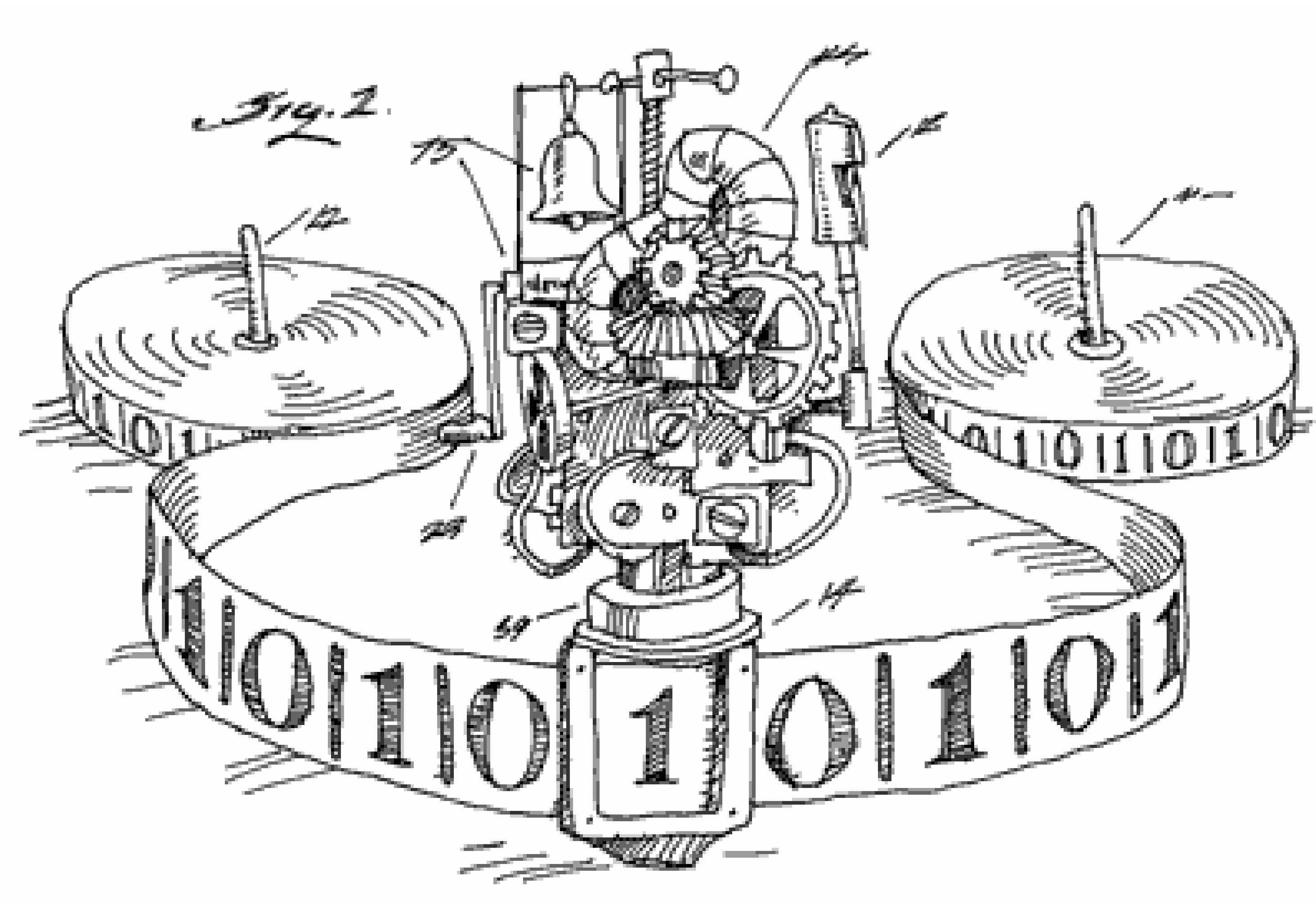
encryption

Sorting

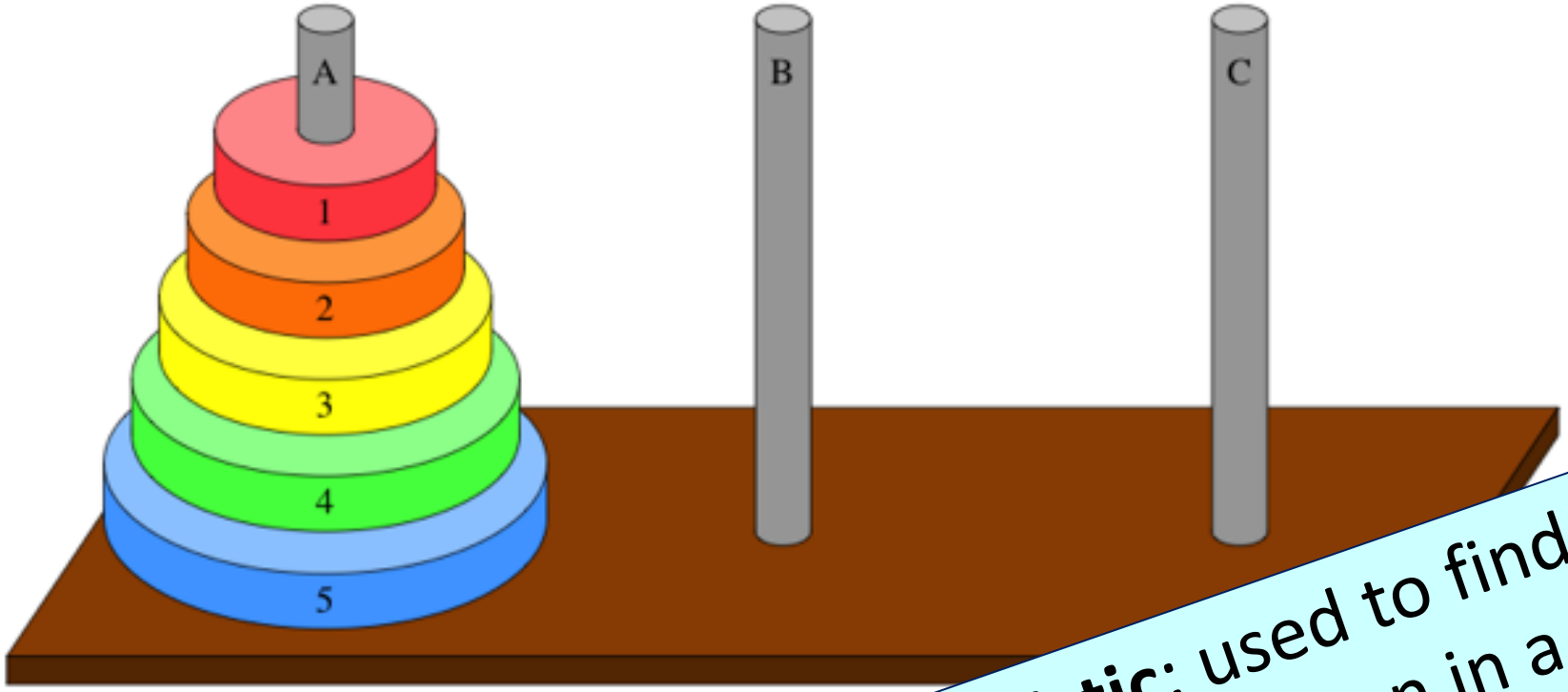
Pythagorean theorem

trig identities

Computation & Computability

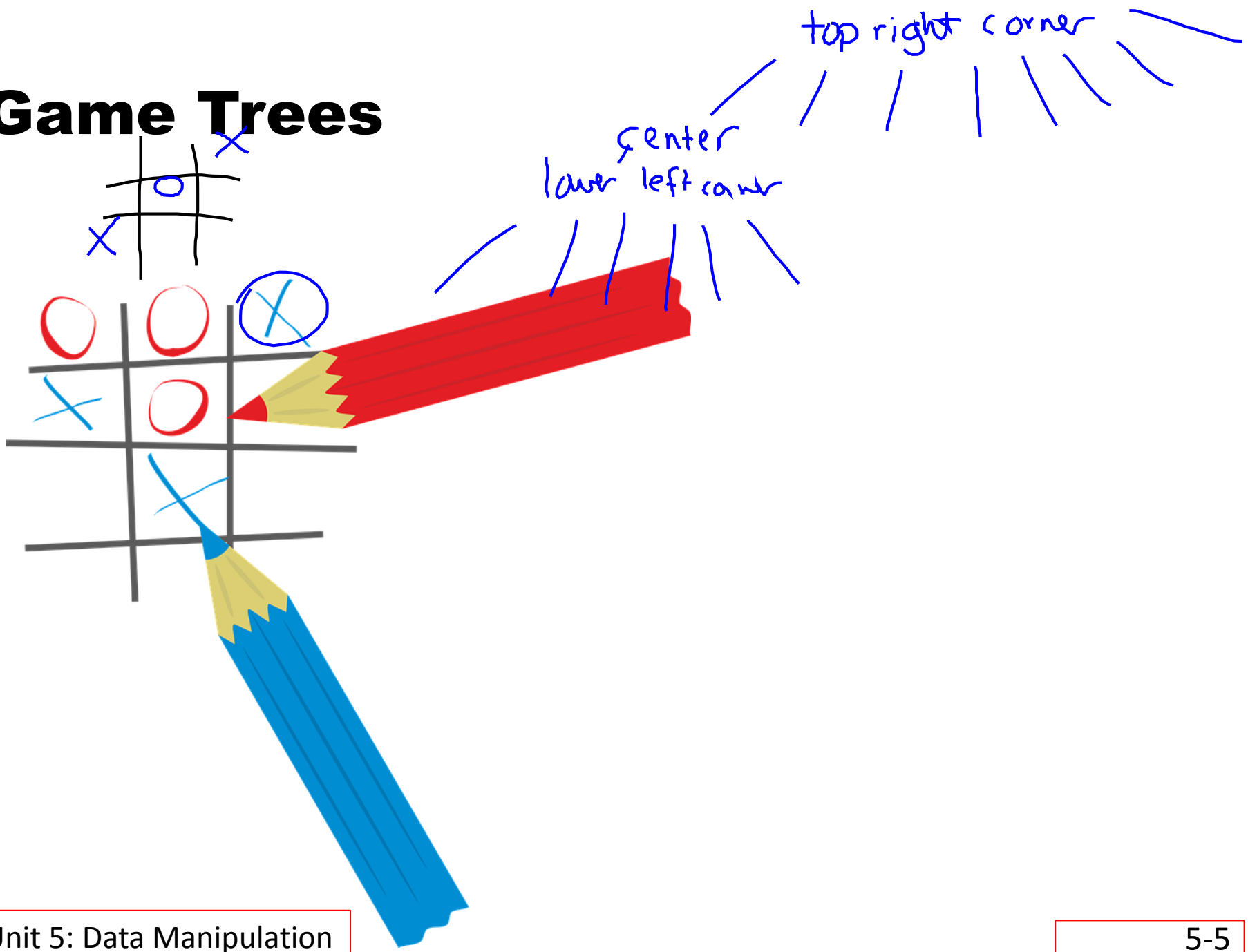


Towers of Hanoi – Another Algorithm

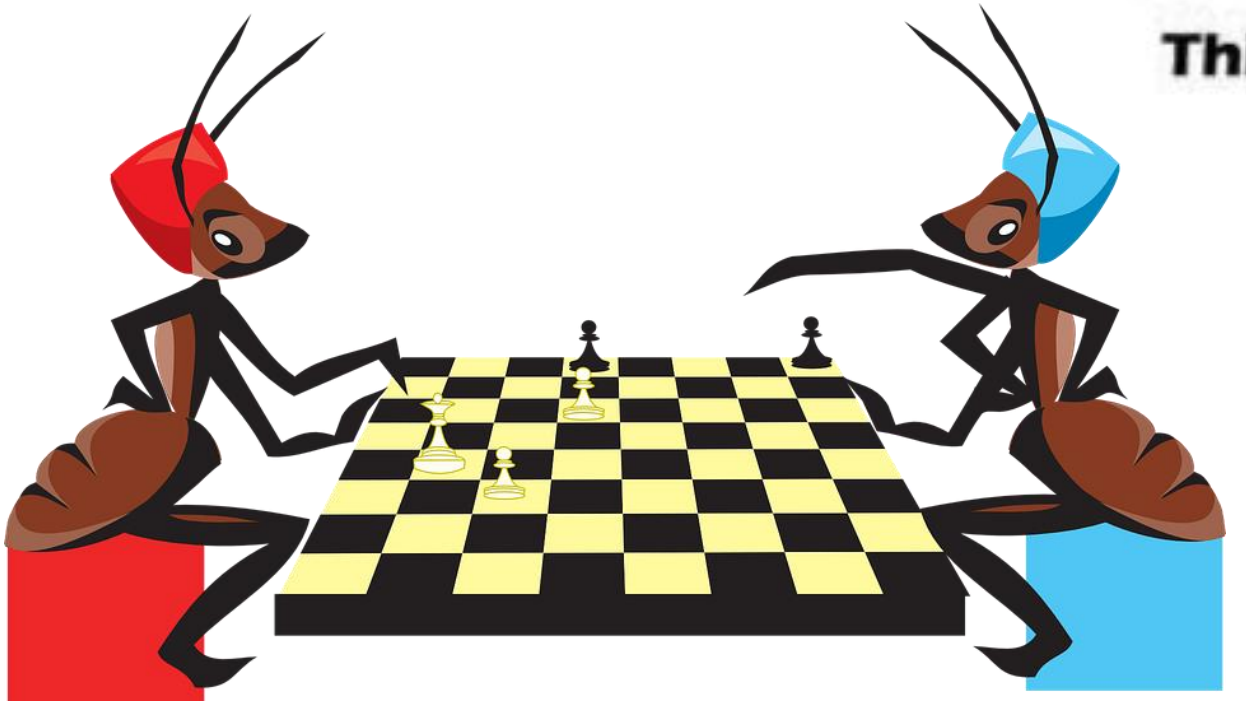


Heuristic: used to find a good solution in a reasonable time

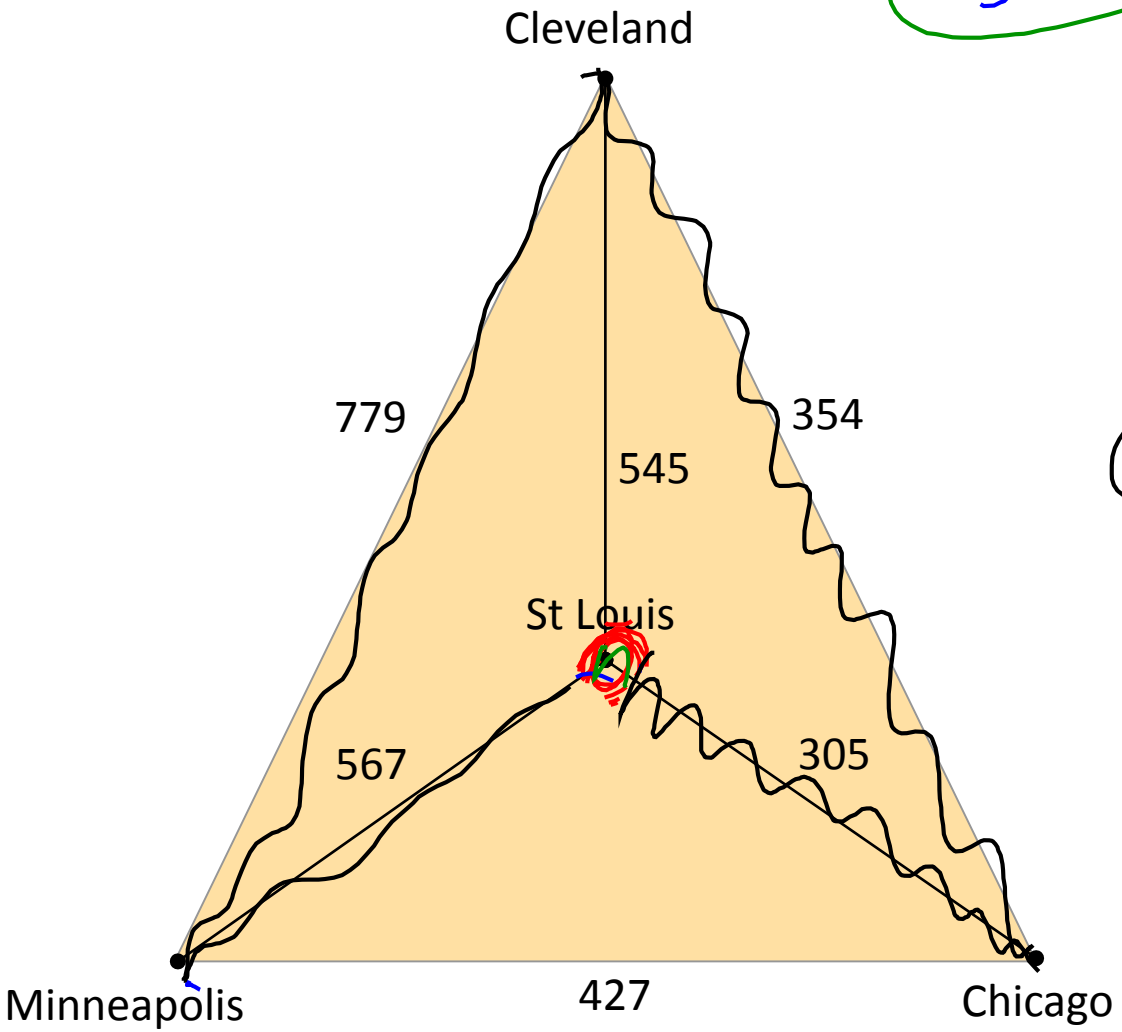
Game Trees



Game Trees

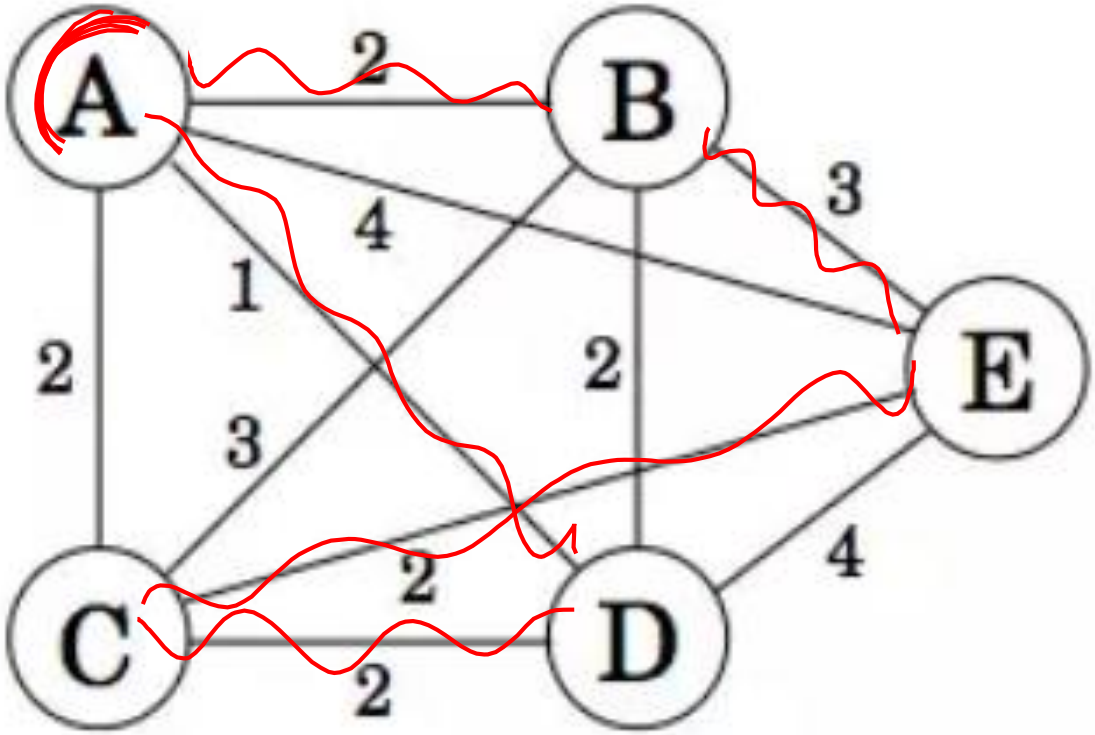


Hamiltonian Circuits



Greedy Algorithm

Hamiltonian Circuits

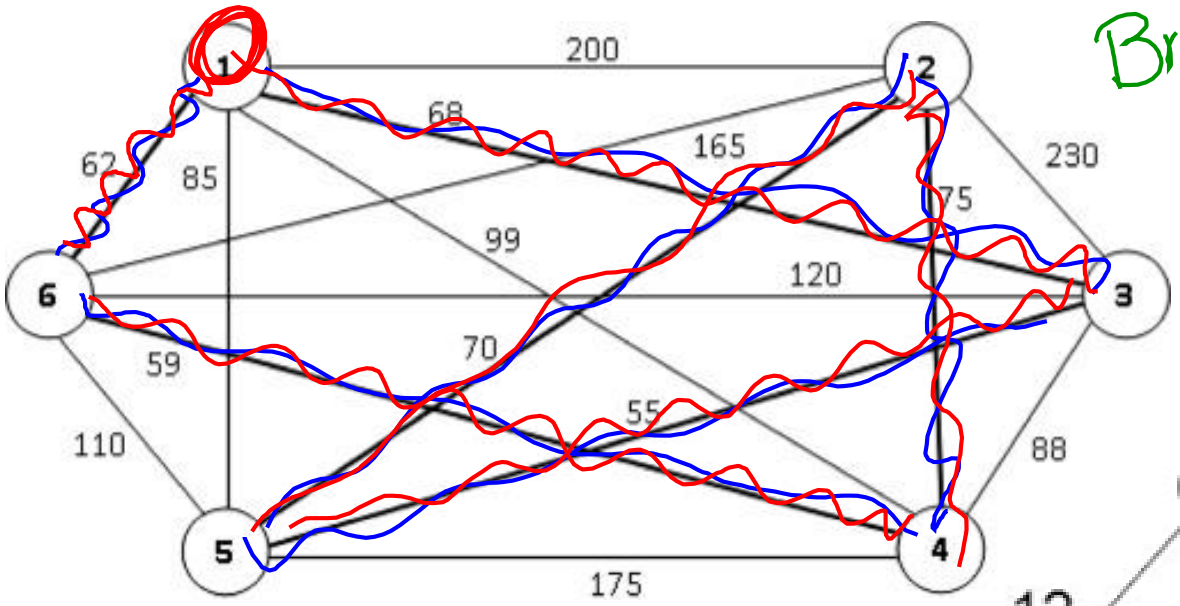


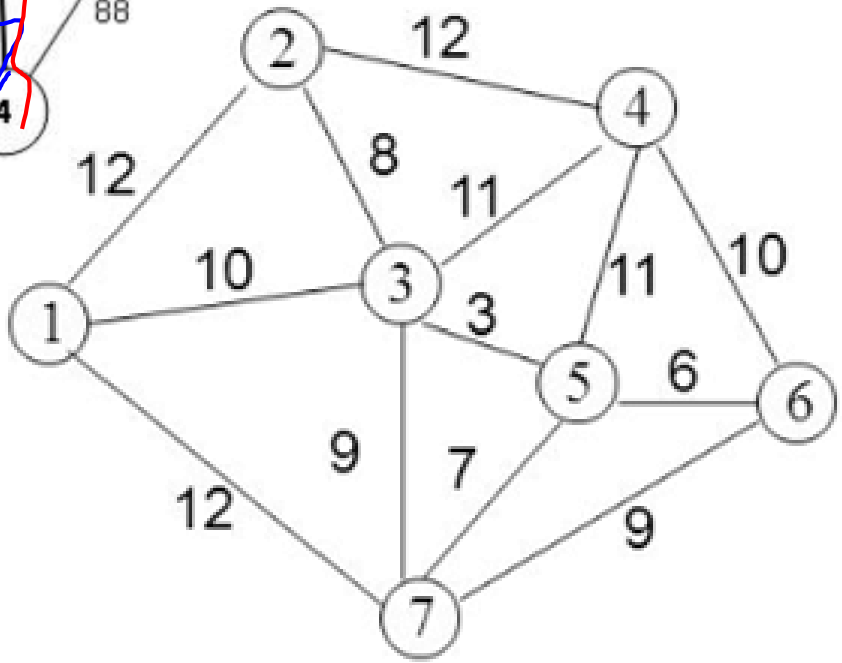
Hamiltonian Circuits

Sorted Edges

Nearest Neighbor

Brute Force





Getting Ready for Create Task