

Outline

Announcements: PA3 is online, PA2 performance report due now

Today:

- Travelling Salesman Problem (TSP)
- Branch and Bound and Backtracking [Preiss 14.2]
- k -approximation and k -opt

Graph Algorithm Questions

See airline flight graph

Describe an algorithm to determine:

- all non-stop flights from JFK ($O()$)
- if any non-stop flights from JFK exist ($O()$)
- greatest distance covered by a non-stop flight from JFK ($O()$)

Associate a price with each flight, describe an algorithm to determine:

- best “value” non-stop flight from JFK (max distance/price) ($O()$)
- best “value” tour (non-stop or connecting flights) from JFK ($O()$)

Graph Algorithm Questions

Describe an algorithm to determine:

- if a flight from JFK to SFO exists ($O(\)$)
- minimal cost (distance or price) from JFK to SFO ($O(\)$)

Suppose numbers represent cost (in billions USD) to build high-speed rail, describe an algorithm to determine least cost construction, such that any city can be reached from any other city ($O(\)$)

Suppose you are planning a family reunion. Your family is spread out all over the US and you are paying for their travel. Describe an algorithm to find the city to host the reunion that minimizes total travel cost ($O(\)$)