

U.S. State

Source: http://en.wikipedia.org/wiki/U.S._state

Areas 1,214 square miles (3,140 km²)
663,268 square miles (1,717,860 km²)

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States:

North Western:

1. Washington,
2. Oregon
3. Idaho,
4. Montana,
5. Wyoming,

South Western:

1. California
2. Nevada
3. Utah
4. Arizona
5. Colorado
6. New Mexico

North Central:

1. North Dakota
2. South Dakota
3. Nebraska
4. Minnesota
5. Iowa
6. Wisconsin
7. Illinois
8. Michigan
9. Indiana
10. Kentucky

South Central:

1. Kansas
2. Missouri
3. Oklahoma
4. Arkansas
5. Texas
6. Louisiana

North Eastern:

1. Ohio
2. New York
3. Pennsylvania
4. New Jersey
5. West Virginia
6. Virginia
7. Maryland
8. Washington D.C.
9. Delaware
10. Connecticut
11. Massachusetts
12. Vermont
13. New Hampshire
14. Rhode Island
15. Maine

South Eastern:

1. Tennessee
2. Alabama
3. Mississippi
4. North Carolina
5. South Carolina
6. Georgia
7. Florida

Due: December 12th (Thr.) 3:00pm

Group Project:

Member: 3 per a team

I. Data Preparation of the Map

$G = (V, E)$ where $w(u,v)$ = a distance between $u \in V$ and $v \in V$.

The mileage chart shows the distances between $85 * 85$ pairs of cities only.

Prepare the data in excel sheet

Submission: Nov. 19th (Tue.), 12:00 PM

II. Connect every city from Grand Forks in the minimum distance: Minimum Spanning Tree of U.S. Cities from Grand Forks.

Submission: Dec. 3rd (Tue.), 12:00 PM

III. Vacation Plan

Submission: Dec. 12th (Thr.), 3:00 PM

You're planning your vacation in the summer to visit a number of famous cities in the U.S.

You will choose one city per each region of {NW, SW, NC, SC, NE, SE}.

Your journey starts from Grand Forks, visiting your chosen cities.

e.g.) Grand Forks → Chicago (IL@NC) → Helena (MT@NW) → Yosemite Village (CA@SW) → Dallas (TX@SC) → Key West (FL@SE) → New York City (NY@NE) → Grand Forks.

Choose your route of the shortest paths for your journey which connects your chosen cities from Grand Forks, returning to Grand Forks.

- a) Choose 6 cities, study the chosen cities for their data, history, etc., and plan your days in each of the cities.

E.g.) N.Y.C:

Day 1: Go to the musical, Lion King

Day 2: Sightseeing, etc.

Day 3: Visit to Metropolitan Museum, Guggenheim Museum, etc.

- b) Devise a variation of single-source shortest path (SSSP) algorithm to find a shortest path between a source and a given destination.

How would you reuse the existing SSSP algorithm?

How would you devise a variant of the existing SSSP algorithm with a new constraint or a heuristic, etc.?

- c) When you order 6 chosen cities, there are $6!=720$ possible ways of ordering.
What rationale would you apply to order the chosen cities to make the entire route shortest? Or, what efficient way do you develop to get the optimal route of the shortest path?
- d) List the route of the shortest path between each chosen cities and its total shortest path weight.

Submission:

Preparation of document:

- 4-6 pages, 1.5 space, single-column.
- Include 1) the title of your project, 2) Names of the Team Members, 3) a Role of each member and 4) the percentage of his/her work.
- Address the Issues listed above. How have you dealt with them?

Program files:

Both source and output file(s)

Presentation:

Date: TBD – a week of 12/10(Tue.) & 12/12 (Thr.)

Submission to eZ-LMS:

A .zip file of the written document + program file(s) + the presentation slide.