

For Monday, 11/10

- Read 9.7
- Take home exam due
- No homework

Exam 2

- Friday
- Questions?

Program 4

- Any questions?

Research Paper

- Any questions?

Warshall's Algorithm

- Note that if there is a path from X to Y and there is a path from Y to Z , then there is a path from X to Z
- for ($y = 0; y < V; y++$)
 for ($x = 0; x < V; x++$)
 if ($a[x][y]$)
 for ($j = 0; j < V; j++$)
 if ($a[y][j]$)
 $a[x][j] = 1;$

All Shortest Paths

- In sparse matrix, just run Dykstra's algorithm for each vertex
- In dense graphs, use a matrix and use an algorithm similar to Warshall's algorithm
- Computes all shortest paths in $O(V^3)$ time
- To determine actual path, need an additional matrix.

Floyd's Algorithm

- for ($y = 0; y < V; y++$)
 for ($x = 0; x < V; x++$)
 if ($a[x][y]$)
 for ($j = 0; j < V; j++$)
 if ($a[y][j] > 0$)
 if ($!a[x][j] ||$
 ($a[x][y] + a[y][j] < a[x][j]$))
 $a[x][j] = a[x][y] + a[y][j];$

Graph Searching

- Depth-first
- Breadth-first
- Best-first

Applications of Searching

- Connectivity in an undirected graph

Bi-Connectivity

Euler Circuits