

# Dijkstra Algorithm Questions And Answers

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v!Complete\*Dijkstra's\*algorithm\*to\*find\*the\*shortestpath\*from\*P\*to\*W\*and\*the\*shortesttime\*

### Lecture 18 Solving Shortest Path Problem: Dijkstra's Algorithm

Lecture 18 Algorithms Solving the Problem • Dijkstra's algorithm • Solves only the problems with nonnegative costs, ie,  $c_{ij} \geq 0$  for all  $(i,j) \in E$  • Bellman-Ford algorithm • Applicable to problems with arbitrary costs • Floyd-Warshall algorithm • Applicable to problems with arbitrary costs • Solves a more general all-to-all shortest path problem

### Exercises: Dijkstra's algorithm

Exercises: Dijkstra's algorithm Questions 1 In breadth first search, each vertex has a 'visited' field which is set to true before the vertex is put in the queue What happens if BFS instead sets the visited field to true when the vertex is removed from the queue? Does the algorithm still work? Does it ...

### CSE373 Fall 2013 Example Exam Questions on Dijkstra's ...

(c) What single edge could be removed from the graph such that Dijkstra's algorithm would happen to compute correct answers for all vertices in the remaining graph? Solution: (b) Computed path to G is A,B,D,F,G but shortest path is A,C,E,G Computed path to D is A,B,D but shortest path is A,C,E,G,D

### Dijkstra Algorithm Questions And Answers

Oct 07 2020 Dijkstra-Algorithm-Questions-And-Answers 3/3 PDF Drive - Search and download PDF files for free Dijkstra's Algorithm Dijkstra's algorithm is a common algorithm used to determine shortest path from a to z in a graph Algorithm  $dijkstra(G :$

### Practice Problems on Dijkstra's Shortest Path Algorithm

of Dijkstra's algorithm so that the SSSP problem can be solved in  $O(nW + m)$  time for a graph with  $n$  vertices and  $m$  edges 1 Created Date: 10/28/2015 11:19:40 AM

### Shortest Path algorithm practice problem (with source 1)

Dijkstra's Shortest Path algorithm practice problem (with source = 1) T[] dist 1 2 3 4 5 6 7 initialize 0  $\infty$   $\infty$   $\infty$   $\infty$   $\infty$   $\infty$   $\infty$  V = 1 0 20  $\infty$   $\infty$   $\infty$

### CSE 373: Data Structures and Algorithms

Dijkstra's Algorithm (Pseudocode) Dijkstra's Algorithm—the following algorithm for finding single-source shortest paths in a weighted graph (directed or undirected) with no negative-weight edges: 1 For each node  $v$ , set  $vcost = \infty$  and  $known = false$  2 Set  $sourcecost = 0$  3 ...

### 27 1 802 6 3 4 19 5 17 8 0 17 13 2 6 - Duke University

Dijkstra's algorithm will run in  $O(V \log V)$  (b) Describe an algorithm that finds the length of shortest paths from root to all other vertices in  $O(V)$  time Solution: This question is easily answered if you realize the graph a directed acyclic graph (or dag), since the SSSP problem can be solved on dags in  $(V + E)$  time using the DAG

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### 10.6 Shortest-Path Problems

Dijkstra's Algorithm Dijkstra's algorithm is a common algorithm used to determine shortest path from a to z in a graph Algorithm  $dijkstra(G :$  weighted connected simple graph with all weights positive)  $G$  has vertices  $a = v_0; v_1; \dots; v_n = z$  and lengths  $w(v_i; v_j)$  where  $w(v_i; v_j) = 1$  if  $(v_i; v_j)$  is not an edge in  $G$  1: for  $i = 1$  to  $n$  do 2

### Shortest Path problems

Figures 1 8 show the application of Dijkstra's algorithm in a sample problem Let us now consider the complexity of Dijkstra's algorithm When we add a new node, we update the labels of all its successors, which requires  $O(n)$  time The selection of the minimum label is also  $O(n)$  Since the While cycle has to be executed  $n$  times, the

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### All Shortest Paths • Questions from exercises and exams

Johnson's Algorithm 0 0 0 0 0 • The algorithm: • Add a dummy vertex,  $v$ , and an edge with weight 0 from  $v$  to every vertex in the graph • The modified graph has the same negative circles Johnson's Algorithm • Run Bellman-Ford from  $v$  to find negative circles, if any • Use the shortest paths from  $v$  to define non-negative weights:

### CSE 331 Sample Final Exam Solutions: Fall 2016

(5×6 =30 points) Answer True or False to the following questions and briefly JUSTIFY each answer A correct answer with no or totally incorrect justification will get you 2 out of 6 points. The path from the run of the Dijkstra's algorithm as the path with the smallest probability of failing in 3

### **An application of Dijkstra's Algorithm to shortest route ...**

The Dijkstra is the most famous and widely used algorithm to solve the shortest path problem because it is fast and uses heap data structures for priority queues shortest path queries which are required in many applications Steinhardt (2006) concludes that Dijkstra's Algorithm traversal algorithms are specialized for finding the shortest

### **CSE 373 Final Exam 3/14/06 Sample Solution**

CSE 373 Final Exam 3/14/06 Sample Solution Page 1 of 10 Question 1 (6 points) A priority queue is a data structure that supports storing a set of values, each of which has an associated key Each key-value pair is an entry in the

### **Distributed Bellman-Ford Example - Initial Distances**

n Dijkstra's shortest path tree (SPT) algorithm Complexity n Message size of message from node k: n  $O(\text{number of edges attached to node } k)$  n Number of messages for each broadcast:  $O(m)$  n Total number of messages:  $O(nm)$  Summary: LS vs DV n In DV send everything you know to your neighbors n In LS send info about your neighbors to everyone