# Uniform Cost Search Description

If all the edges in the search graph do not have the same cost then breadth-first search generalizes to uniform-cost search. Instead of expanding nodes in order of their depth from the root, uniform-cost search expands nodes in order of their cost from the root. At each step, the next step n to be expanded is one whose cost g(n) is lowest where g(n) is the sum of the edge costs from the root to node n. The nodes are stored in a priority queue. This algorithm is also known as Dijkstra’s single-source shortest algorithm.

Whenever a node is chosen for expansion by uniform cost search, a lowest-cost path to that node has been found. The worst case time complexity of uniform-cost search is O(bc/m), where c is the cost of an optimal solution and m is the minimum edge cost. Unfortunately, it also suggests the same memory limitation as [breadth-first search](http://intelligence.worldofcomputing.net/ai-search/breadth-first-search.html).