Bahirdar university engineering faculty

School of computing and electrical engineering

Department of CSED

AI Assignment #3 on 8 puzzle problem

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Assignment #4

1. Given, the following problem

Where S is start/initial state and G is goal state, find the optimal sequence of actions (solution sequence) to the goal state.

1. Implement the problem using one of the uniformed search algorithms(Breath\_first search)
2. Implement using one of the informed search algorithm (death\_first search)

Date given: 18/11/2011

Due date: 30/11/2011

Type: individual

Submission: in person

1. Implement the problem using one of the uniformed search algorithms

**USING Uniform-Cost Search**

**GENERAL-SEARCH (problem, ENQUEUE-BY-PATH-COST)**

**Exp. node nodes list**

 **{S(0)}**

 **S {A(3) B(1) C(8)}**

 **B {A(3) C(8) G(21)}**

 **A { C(8) G(21) D(6) E(10) G’(18)}**

 **D { C(8) G(21) E(10) G’(18)}**

 **C { G(21) E(10) G’(18) G’’(13)}**

 **E { G(21) G’(18) G’’(13)}**

 **G’’ {G(21) G’(18) }**

 **Solution path found is S C G <-- this G has cost 13**

 **Number of nodes expanded (including goal node) = 7**

1. Implement using one of the informed search algorithm
* **Apply three functions over every nodes**
	+ **g(n): Cost of path found so far from initial state to n**
	+ **h(n): Estimated cost of shortest path from n to z**
	+ **f(n): Estimated total cost of shortest path from a to z via n**

**Hence I have estimated h(n) for each nodes using their cost as follows:**

 **S(h=8),A(h=6),B(h=8),C(4),D=infinitive,E=infinity,G(0).**

**USING THE RULE:**

 ***h (n)* >= 0 for all nodes *n***

***h (n)* = 0 implies that *n* is a goal node**

***h (n)* =** INFINITY **implies that *n* is a “dead end” from which a goal cannot be reached.**

FINALLY I HAVE APPLIED THE FORMULA Evaluation function f(n) = h(n) + g(n) AND SELECTING THE SHORTEST

|  |  |  |
| --- | --- | --- |
| **state** | **open** | **Closed** |
|  | **S:8** |  |
| **S** | **A:11 , B:9** |  |
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