

Review Test Submission: Week04 Quiz Ch03 (2)

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Course	CS 6364.001 - Artificial Intelligence - F15
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Results Displayed	All Answers, Submitted Answers, Correct Answers

Question 1

11 out of 13 points

The majority of work in the area of search has gone into finding the right **search strategy** for a problem. Select the best choice for each question

Question	Correct Match	Selected Match
___ is to simultaneously search both forward from the initial state and backward from the goal, and stop when the two searches meet in the middle.	<input checked="" type="checkbox"/> A. bidirectional search	<input checked="" type="checkbox"/> A. bidirectional search
___ is a strategy that sidesteps the issue of choosing the best depth limit by trying all possible depth limits: first depth 0, then depth 1, then depth 2, and so on.	<input checked="" type="checkbox"/> M. Iterative deepening search	<input checked="" type="checkbox"/> M. Iterative deepening search
___ imposes a cutoff on the maximum depth of a path.	<input checked="" type="checkbox"/> J. Depth-limited search	<input checked="" type="checkbox"/> J. Depth-limited search
The drawback of ___ is that it can get stuck going down the wrong path.	<input checked="" type="checkbox"/> L. Depth-first search	<input checked="" type="checkbox"/> L. Depth-first search
The term means that they have no information about the number of steps or the path cost from the current state to the goal—all they can do is distinguish a goal state from a nongoal state.	<input checked="" type="checkbox"/> H. Uninformed Search	<input checked="" type="checkbox"/> H. Uninformed Search
___ is also sometimes called blind search .	<input checked="" type="checkbox"/> H.	<input checked="" type="checkbox"/> H.

	Uninformed Search	Uninformed Search
Strategies called informed search strategies are also called ____.	✓ D. Heuristic Search	✓ D. Heuristic Search
In this strategy, the root node is expanded first, then all the nodes generated by the root node are expanded next, and then <i>their</i> successors, and so on.	✓ I. breadth-first search	✓ I. breadth-first search
In ____, all the nodes at depth d in the search tree are expanded before the nodes at depth $d + 1$.	✓ I. breadth-first search	✓ I. breadth-first search
____ modifies the breadth-first strategy by always expanding the lowest-cost node on the fringe (as measured by the path cost $g(n)$), rather than the lowest-depth node.	✓ B. Uniform cost search	✓ B. Uniform cost search
____ finds the cheapest solution provided a simple requirement is met: the cost of a path must never decrease as we go along the path.	✓ B. Uniform cost search	✗ C. Optimality
____ always expands one of the nodes at the deepest level of the tree. Only when the search hits a dead end (a nongoal node with no expansion) does the search go back and expand nodes at shallower levels.	✓ L. Depth-first search	✓ L. Depth-first search
____ needs to store only a single path from the root to a leaf node, along with the remaining unexpanded sibling nodes for each node on the path.	✓ L. Depth-first search	✗ M. Iterative deepening search

All Answer Choices

- A. bidirectional search
- B. Uniform cost search
- C. Optimality
- D. Heuristic Search
- E. Space complexity
- F. Completeness
- G. Time complexity
- H. Uninformed Search
- I. breadth-first search
- J. Depth-limited search
- K. Informed Search
- L. Depth-first search
- M. Iterative deepening search

Question 2

8 out of 8 points

There are two empty jugs, one of 4 gallons, one of 3 gallons. Fill the 4-gallon jug with 2 gallons of water. Consider how to represent states.

s_0 : (initial state) (0,0)

s_i : (state i) (x_i, y_i) where: x_i is the content of 4-gallon jug, y_i is the content of 3-gallon jug

s_G : (goal state) (2,0)

Actions are to fill or empty the jugs. And the rules of actions are described as follows.

Rule1. Fill jug if empty: if jug X is empty, fill jug X to the rim.

Rule2. Transfer water from jug to jug: if jug X is empty and jug Y has water, then move water from jug Y to jug X where $X > Y$ (that is, the amount of water in jug X is greater than the amount of water in jug Y).

Rule3. Empty jug if it is not empty (on the ground)

A state-transition from a state (x_i, y_i) will be its next state (x_{i+1}, y_{i+1}) after an action

$(x_i, y_i) \rightarrow \text{Action} (x_{i+1}, y_{i+1})$

Select the best answer (action) for each state-transition

Question	Correct Match	Selected Match
$(x, y) \rightarrow (4, y)$ where $x < 4$	✔ G. Fill the 4-gallon jug	✔ G. Fill the 4-gallon jug
$(x, y) \rightarrow (x, 3)$ where $y < 3$	✔ E. Fill the 3-gallon jug	✔ E. Fill the 3-gallon jug
$(x, y) \rightarrow (0, y)$ where $x > 0$	✔ A. Empty the 4-gallon jug on the ground	✔ A. Empty the 4-gallon jug on the ground
$(x, y) \rightarrow (x, 0)$ where $y > 0$	✔ B. Empty the 3-gallon jug on the ground	✔ B. Empty the 3-gallon jug on the ground
$(x, y) \rightarrow (4, y - (4 - x))$ where $(x + y) \geq 4$ and $y > 0$	✔ C. Pour water from the 3-gallon jug into the 4-gallon jug until the 4-gallon jug is full	✔ C. Pour water from the 3-gallon jug into the 4-gallon jug until the 4-gallon jug is full
$(x, y) \rightarrow (x - (3 - y), 3)$ where $4 \geq (x + y)$ and $y > 0$	✔ D. Pour water from the 4-gallon jug into the 3-gallon jug until the 3-gallon jug is full	✔ D. Pour water from the 4-gallon jug into the 3-gallon jug until the 3-gallon jug is full
$(x, y) \rightarrow (x + y, 0)$ where $3 \geq (x + y)$ and $x > 0$	✔ H. Pour all the water from the 3-gallon jug into the 4-gallon jug	✔ H. Pour all the water from the 3-gallon jug into the 4-gallon jug
$(x, y) \rightarrow (0, x + y)$	✔ F.	✔ F.

Pour all the water from 4-gallon jug into the 3-gallon jug

Pour all the water from 4-gallon jug into the 3-gallon jug

All Answer Choices

A. Empty the 4-gallon jug on the ground

B. Empty the 3-gallon jug on the ground

C. Pour water from the 3-gallon jug into the 4-gallon jug until the 4-gallon jug is full

D. Pour water from the 4-gallon jug into the 3-gallon jug until the 3-gallon jug is full

E. Fill the 3-gallon jug

F. Pour all the water from 4-gallon jug into the 3-gallon jug

G. Fill the 4-gallon jug

H. Pour all the water from the 3-gallon jug into the 4-gallon jug

Question 3

4 out of 4 points

The majority of work in the area of search has gone into finding the right **search strategy** for a problem. In our study of the field we will evaluate strategies in terms of four criteria. Select the best choice for each criteria.

Question

Correct Match

Selected Match

Is the strategy guaranteed to find a solution when there is one?

✓ C. Completeness

✓ C. Completeness

how long does it take to find a solution?

✓ A. Time complexity

✓ A. Time complexity

how much memory does it need to perform the search?

✓ B. Space complexity

✓ B. Space complexity

does the strategy find the highest-quality solution when there are several different solutions?

✓ D. Optimality

✓ D. Optimality

All Answer Choices

A. Time complexity

B. Space complexity

C. Completeness

D. Optimality

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