CSPB 3702 - Reckwerdt - Cognitive Science

Started on	Sunday, 17 September 2023, 11:11 PM
State	Finished
Completed on	Sunday, 17 September 2023, 11:36 PM
Time taken	25 mins 1 sec
Grade	Not yet graded

Question **1**

Complete

Mark 1.00 out of 1.00

Which of the following is not true of the sorts of "abstract puzzle problems" discussed in this lecture?

Select one:

- a. **They represent an evolutionarily recent sort of problem solving.**
- b. **They generally don't require a wide degree of background (or "common-sense") knowledge.**
- c. **They don't have a particularly strong affective or emotional component.**
- d. **They can be solved without the use of conscious effort.** ✓

Your answer is correct.

Question **2**

Complete

Mark 1.00 out of 1.00

Which of the following is not a typical example of the sort of problem discussed in this lecture?

Select one:

- a. **The "15-16" sliding tile puzzle**
- b. **Rubik's Cube**
- c. **Poker** ✓ **requires a great deal of psychology (maybe "folk psychology"?) to play effectively**
- d. **Sudoku**

Your answer is correct.

Question **3**

Complete

Mark 1.00 out of 1.00

As we have seen, many puzzle-like problems can be represented in a graph ("problem space") format. Which of the following is not (typically) true of this sort of format?

Select one:

- a. **The larger the number of vertices (states) in the graph, the harder the problem is to solve.**
- b. **A move in the puzzle is represented by an edge between two states of the puzzle.**
- c. **Problem space graphs always have astronomical-size (or infinite) numbers of vertices (states) among which to search.** **Simply not true. Some problem space graphs are relatively small.**
- d. **Our goal is to find a path of edges in the graph from our current (or starting) state to a "goal state".**

Your answer is correct.

Question **4**

Complete

Mark 1.00 out of 1.00

In the chapter by Pretz et al., there is a discussion of "well-defined" versus "ill-defined" problems. Which of the following is true of ill-defined problems?

Select one:

- a. **Ill-defined problems tend not to be important.**
- b. **Ill-defined problems generally don't lend themselves to "problem-space" representation.**
- c. **Ill-defined problems always have a clear and correct solution.**
- d. **Ill-defined problems can be solved by well-understood search algorithms.**

Your answer is correct.

Question **5**

Complete

Mark 1.00 out of 1.00

Consider the famous "farmer crossing the river with a chicken, a fox, and bag of grain" problem (a brief statement of the problem can be found at https://riddlesbrainteasers.com/fox-chicken-sack-grain/). Which of the following is not true of this problem?

Select one:

- a. **One cannot represent this problem in a problem space format.**
- b. **One can solve this problem by systematic search of a problem space.**
- c. **This problem is far easier than Rubik's Cube.**
- d. **The size of the problem space graph for this problem is relatively small.**

Your answer is correct.

Question **6**

Complete

Mark 1.00 out of 1.00

Suppose we have a problem space representation in which the (lone) goal state can be reached via a sequence of edges from some states but not others. Which of the following statements is true of this problem (and its graph)?

Select one:

- a. **This is an ill-defined problem.**
- b. **The number of "good" start states will always be fewer than the number of "bad" (no available path) start states.**
- c. **As long as our start state is among the states with paths to the goal state, then we can consider this problem easy.**
- d. **As long as our start state is among the states with paths to the goal state, then we can consider this problem solvable.**

Your answer is correct.

Question **7**

Complete

Mark 1.00 out of 1.00

What is a common problem with breadth-first search as a general method of searching a problem space?

Select one:

- a. **It is difficult to express either algorithmically, or in words.**
- b. **If the nearest solution is many moves away (and the graph is large), the number of states we need to search might be practically impossible.**
- c. **It always requires a great deal of time and space to implement.**
- d. **If there are many potential solution paths to our problem, breadth first search may become confused as to which solution path we should use.**

Your answer is correct.

Question **8**

Complete

Mark 1.00 out of 1.00

The "mutilated chessboard" example from lecture illustrates which of the following ideas about problem solving?

Select one:

- a. **Sometimes the best way to solve a problem is to experiment with a novel representation of the problem (other than the obvious representation).**
- b. **Problems can be solved in multiple ways.**
- c. **Trick problems may be ill-defined.**
- d. **There are many "trick" problems that can't be solved in straightforward ways.**

Your answer is correct.

Question **9**

Complete

Mark 1.00 out of 1.00

Under which circumstances would it be sensible to use generic breadth-first search in solving a problem?

Select one:

- a. **The closest possible solution is sure to be at most a few moves away, and number of available moves at each step is not exceptionally large.**
- b. **Given a state of the problem, we have many additional clues about what might be the best move from this particular state.**
- c. **There are many possible paths to a solution in this problem.**
- d. **The closest possible solution is sure to be many moves away.**

Your answer is correct.

Question **10**

Complete

Mark 1.00 out of 1.00

Under which circumstances would it be sensible to use (or consider) means-ends analysis in solving a problem?

Select one:

- a. **The problem space is of particularly small size**
- b. **The problem space is of astronomical size, or infinite.**
- c. **Given a state of the problem, we can easily determine how many moves in this graph it will take to reach the goal state.**
- d. **Given a state of the problem, we can compare it to the goal state and decide what is the most important difference between our state and the goal.**

Your answer is correct.

Question **11**

Complete

Mark 1.00 out of 1.00

When we speak of the issue of "optimality" in lecture, to what idea are we referring?

Select one:

- a. **Our problem-solving method may fine one particular solution, but that solution may not be (for our purposes) the best solution.**
- b. **Our problem-solving method may be good for some problems but not for others.**
- c. **Our problem-solving method may require an inordinately large quantity of computational space in which to run, even if it is otherwise practical.**
- d. **Our problem-solving method may take an extremely long time to run, even if it does eventually find a solution.**

Your answer is correct.

Question **12**

Complete

Mark 1.00 out of 1.00

Which of the following best describes (on the basis of experimental evidence) people's use of logical reasoning?

Select one:

- a. **People are capable of reasoning logically, but it takes effort and they do so inconsistently (depending on context) in everyday situations.**
- b. **People can reason logically, but only if they are urged to do so consciously.**
- c. **People can and do use logic extensively in their everyday reasoning.**
- d. **People are hopelessly incapable of reasoning logically.**

Your answer is correct.

Question **13**

Complete

Marked out of 5.00

Remind yourself how to play Tic Tac Toe with this online game or similar.

https://playtictactoe.org/

After playing a bit you should. be able to come up with a strategy so that you always come to a draw.

Describe your strategy.

Could a computer use your strategy?

I try to cover opposite corners of the board with my first two moves. If I am able to do this, then I play defense and I just cut off the other player from getting three in a row. This is done by constantly re-evaluating where my next move should go to both prevent the computer from winning and prohibit me from winning.

This is also contingent upon who goes first. If the other player goes first, then I first cover a corner and then my second move is used to search through the board and see where the other player might win. If I find a spot where the player might win and it prohibits me from winning as well, I place my move in that spot.

I think you could program a computer to follow a similar strategy with some kind of search algorithm like a depth first search. I say this because you want to look for all possible ways a player might be able to win and then place a move in that spot that would prohibit them from winning. I think someone could achieve this, but it would have to be done in a manner that can cover all possible bases.

Question **14**

Complete

Mark 1.00 out of 1.00

Read this article about a brute force method for solving Tic Tac Toe

https://twice22.github.io/tictactoe/

This is exactly how humans play.

Select one:

- True
- False

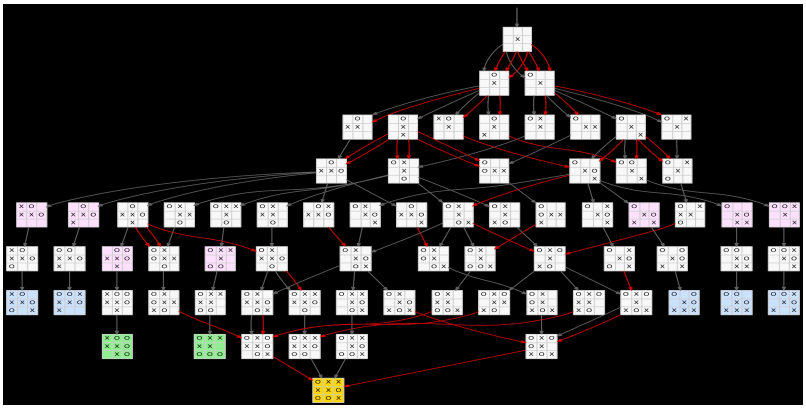
Question **15**

Complete

Mark 5.00 out of 5.00

What is true about the following?

(choose 3)



Select one or more:

- [ ] a.
There are more paths through the tree where 0 wins than games ending in a draw.

- [x] b.
A computer using a table like this can look ahead to outcomes of a game.

- [ ] c.
This tree shows all possible games of Tic Tac Toe

- [x] d.
This tree assumes x will start in the middle.

- [x] e.
The tree shows that there is a possible way for 0 to win if X goes first.

Your answer is correct.

Question **16**

Complete

Marked out of 5.00

Answer AFTER seeing the "Teddy Roosevelt" question in the lectures.

Without doing any additional research, what is your best guess/answer as to what causes the phases of the moon?

Would you say this is something you know/believe/understand or just the answer you have heard or believe is "right?"

by the way, this not an easy question question - if you have no idea, please discuss what you know about the moon or if you remember anyone trying to explain it to you.

The moons phases come to us in terms of where it is at in the orbit of Earth. Since the Earth rotates, and the Moon orbits the Earth, the Moon is constantly changing positions in the sky relative to certain areas on Earth. As the Moon completes an orbit around Earth, we see the phases of it change every night because of the location relative to a specific area on Earth. What is a new Moon for us could be a full Moon for someone on the opposite side of the earth.

I have a Physics degree so this is something that I studied in previous classes. The concept of the Moon orbiting us as we spin on an axis really explains why there are phases of the Moon.

Question **17**

Complete

Mark 1.00 out of 1.00

Here is the moon in the eastern sky in October.

Where is the sun, and what time of day must it be?

- a. Sun is in the west and it is evening.
- b. Sun is in the east and it is evening.
- c. Sun is in the west and it is morning.
- d. Sun is in the west and it is morning.
- e. Sun is in the north and it is 2:23pm

Your answer is correct.

Question **18**

Complete

Mark 1.00 out of 1.00

One way to understand the phases of the moon is to ask yourself "Where is the moon?" and "Where is the sun?"

For example, this is the full moon over the mountains (to the west) in Boulder in the morning.

Where is the sun?

(If you cannot see the moon in the picture, trying zooming out of the webpage.)

- a. In the west
- b. In the south
- c. In the east
- d. In the north

Your answer is correct.

Question **19**

Complete

Marked out of 5.00

Find the moon in the sky sometime this week. Where is the sun?

Where does the sun need to be in relation to the moon to get a full moon?

Where does the sun need to be in relation to the moon to get a crescent moon?

If it is midnight, where is the sun?

If it is midnight and the moon is overhead, how will it look?

For this problem, imagine that we are looking at the position of the Sun as a 6 O'clock position on a clock and the Earth is in the center of the clock. The Moons orbit around Earth will mimic a hand of a clock but it will obviously be in closer to Earth (the clock hand is very small).

Since the Sun is always at 6 O'clock, for us to be able to see the Moon we need the Moon to be in a position that is somewhere between like 8 and 4 O'clock (not 5, 6, or 7).

For there to be a full Moon, the moon must be very close to the 12 O'clock position. Earth can still see a full moon if it is not mid day, but it is important that the Moon be very close to 12 O'clock.

For the Moon to be a crescent Moon, we need the Moon to be somewhere in the range of 8 to 10 O'Clock or 2 to 4 O'clock.

If it is midnight, this means that the part of the Earth where it is midnight is facing 12 O'clock and the Sun is still at 6 O'clock.

If it is midnight and we can see the Moon, then it is somewhere between 8 and 4 O'clock. If we can't see it, then the Moon is on the opposite side of the Earth as to where it is midnight for people at the current moment.

Question **20**

Complete

Marked out of 5.00

Please solve the Teddy Roosevelt question.

Do you think a computer could solve this puzzle?

How might it solve this puzzle?

Given that we don't have context as to where this person is on the planet, what time period this is in, the most logical answer to this question is that the man did not vote for Teddy Roosevelt.

I don't think a computer could necessarily solve this puzzle because there are too many aspects that are open to interpretation about this problem. Like the time period of when this happened, what country this person is in, and if the man is even allowed to vote if he is in America at the time Roosevelt was running for President.

If a computer had more information, it might be possible for it to solve. But on it's face, this puzzle is far too open ended for a computer to try to solve and I don't believe that it could solve it accurately.