Assignment 01_Write your own Final Exam|Quiz

1. Duex Ex Machina

Choose one of the following algorithms that we learned, state its time complexity, space complexity, explain how it works, and when to use this algorithm:
- Greedy algorithm
- A*
- DFS
- BFS
- etc.

2. Intelli-gents

Topic: Philosophy of Artificial Intelligence

a) Explain what the Turing Test is.

b) State the limitations of the Turing Test.

c) Create an AI test that overcomes the Turing Test's weaknesses.

3. Blazing Angels

Philosophy: Explain how the Turing test can be used to determine if a machine is artificially intelligent.

Search Techniques: What is the completeness, optimality, space complexity, and time complexity of an uninformed search?

BrainBitz

Discuss the differences between DFS and BFS in terms of completeness, optimality, and time and space complexity. When is BFS preferable over DFS?

HAL9000

How can we evaluate a heuristic function, or choose between two different heuristic functions which is better?

MTIS1

1- We are heading toward autonomous driving. What kind of artificial intelligence should be embedded in autonomous cars?

2- In writing a chess-playing program, would it be better to implement depth-first or breadth-first search? Briefly explain why.

Next_Gen

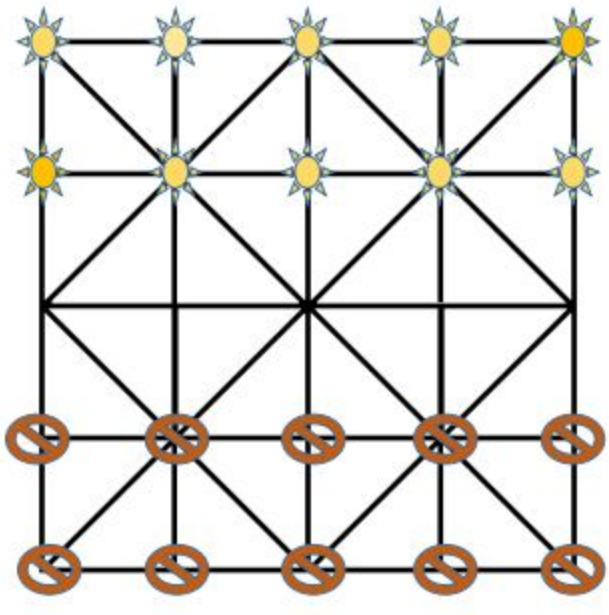
Your goal is to navigate a robot out of a maze. The robot starts in the center of the maze facing north. You can turn the robot to face north, east, south, or west. You can direct the robot to move forward a certain distance, although it will stop before hitting a wall.

a. Formulate this problem. How large is the state space?

b. In navigating a maze, the only place we need to turn is at the intersection of two or more corridors. Reformulate this problem using this observation. How large is the state space now?

c. From each point in the maze, we can move in any of the four directions until we reach a turning point, and this is the only action we need to do. Reformulate the problem using these actions. Do we need to keep track of the robot's orientation now?

Cyber Blue



12 – Bit Strategic Board Game

12-Bit is a board game, involves thinking and planning. It is a two player game, who takes turn moving by their tokens. Players begin game with 12 tokens each, placed on upper and bottom side nodes of the board as shown in figure and can be moved from node to node along a line. How to make movements: Each player can move token

- only to an empty node.
- to an adjacent node or next to adjacent node if the respective adjacent node is booked with opponent's token.
- Who is winner?
- If a player's token lands on a node next to an adjacent node (booked with opponent's token), then the opponent's token is killed and removed from the board.
- A player who first kills all opponent's tokens is declared winner.

Team Spartan

Suppose we had successfully programmed an AI that passes the Turing test. How will it answer this question? (Hint: it is self-referential)

Emotional Intelligence

Write or design one question in one of the following topics

Philosophy of Artificial Intelligence

In 1950, Alan Turing put forward the famous "Turing Test": If a computer successfully makes a human can't tell whether it is a computer, then this computer has intelligence like human being.

In 1980, philosophy professor Dr. John Searle proposed the "Chinese Room Argument" thought experiment, and this ideological experiment Questioned the validity of the Turing test. Even if a computer through the Turing test, is not really has intelligence: *"Imagine a native English speaker who knows no Chinese locked in a room full of boxes of Chinese symbols (a data base) together with a book of instructions for manipulating the symbols (the program). Imagine that people outside the room send in other Chinese symbols which, unknown to the person in the room, are questions in Chinese (the input). And imagine that by following the instructions in the program the man in the room is able to pass out Chinese symbols which are correct answers to the questions (the output). The program enables the person in the room to pass the Turing Test for understanding Chinese but he does not understand a word of Chinese."* Whether the "Chinese Room Argument" thought experiment successfully rejected the validity of the Turing test is controversial, but it successfully revealed in a defect in the Turing test. What is it?

Reference Answer:

The philosophical basis behind the Turing test is Behaviorism or Functionalism, or rather, it belongs to such philosophy schools: translates all of spiritual phenomena into physical phenomena.
It ignores the human spirit, emotional, and qualia characteristics, only consider the functional characteristics. But the perfect implementation of all human functions of the robot may still lack a real sense, consciousness, or qualia.

Search techniques in AI

Question1:

Deep learning is a technique applied in AI, which provides inductive knowledge and laws by doing training on large datasets. Here is an interesting scenario that might happen in the future.
In 2025, a pizza restaurant receives a phone call, and a robot waiter answers the phone: "Hello, how can I help you today?" The customer replies: "Hi, may I have...?" The robot interrupts him: "May I have your membership number, please?" "Sure, 1678254." The customer replies. "Mr. Cruise, your address is 1668 King Street, Toronto ON M3T 2R8, and your phone number is 647-992-1980." Mr. Cruise: "May I have a seafood pizza?" Robot: "Mr. Cruise, we will not recommend you a seafood pizza." Mr. Cruise puzzles, "Why?" Robot: "Recently your blood pressure and cholesterol are too high according to your medical record." Mr. Cruise: "Then what should I have instead?" Robot: "we suggest you having a try on our low-fat pizza." Mr. Cruise gets surprised: "How do you know I would like this one?" Robot: "You borrowed a book named low-fat healthy menu from public library last Monday." Mr. Cruise: "Well... I would like to have an extra-large one, how much is it?" Robot: "$45, and it is enough for your six family members". "But your mother should eat little, since she just accepted a heart surgery last month." Robot says. Mr. Cruise: "May I pay for it by credit card?" Robot: "Sorry, please pay by cash, since your credit card is owing $4587 now, not including your mortgage." Mr. Cruise feels ashamed: "I will

withdraw cash in ATM". Robot: "But you have already reached yours withdraw limit today." Mr. Cruise feels angry: "Ok, please deliver it to my home, and I will pay you at my home. How long will it take?" Robot answers: "30 minutes, if you can't wait, we suggest you picking it up by yourself." Mr. Cruise: "Why?" Robot: "According to your GPS record, your registration vehicle BMLL546 is now being parked in Brimley Street near Scarborough Town Centre."

According to this scenario, how do you think of the ethical problems AI might bring to us? How can human protect information security from intelligent machine tampering?

Question2:

Compare Search Techniques

Reference Answer

Criterion	BFS	UCS	DFS	DLS	IDS	BS
Time	b^d	b^d	B^m	B^l	b^d	$b^{d/2}$
Space	b^d	b^d	bm	bl	bd	$b^{d/2}$
Optimal?	Yes	Yes	No	No	Yes	Yes
Complete?	Yes	Yes	No	Yes, If l>=d	Yes	Yes