Student ID:		Duration: 15 min	ns Date: 12/06/2023
Student name:		<b></b>	Score: <u>/ 3</u>
considered is a little leplayed on four grids, ships and records the records their shots. To player's ships.  Before play begins, each grid. Each ship occupe either horizontally or squares for each ship. given square in the grame for each player.	consider the following scenary, who plays Battleship wintown for each player. On one shots by the opponent. On the objective of the game is chapter secretly arranges the ies several consecutive squary vertically. The type of ship of the ships cannot overlap (i.e., rid). The types and numbers Furthermore, he cannot see the same of one player's ships.	th his friend. The game is grid, the player arranges the other grid, the player to destroy the opposing teir ships on their primary res on the grid, arranged determines the number of of ships allowed are the	
Identify the following t	task environment properties o	squares that their opponent had the above scenario. Do not for will give you 0 credit for the co	rget to give your explanation
O Fully observable	O Partially observable	Explanation:	
O Single-agent	O Multi-agents	Explanation:	
O Stochastic	O Deterministic	Explanation:	
O Episodic	O Sequential	Explanation:	
Question 2 (1pt) Wh	nat is a frontier? How do you	implement a frontier if using	Breadth-first search?

Student ID:	Duration: 15 mins	Date: 12/06/2023
Student name:		Score:/ <u>3</u>
Question 1 (2pts) Consider the following scenario. The considered is a little boy, who plays Battleship with his frien played on four grids, two for each player. On one grid, the p ships and records the shots by the opponent. On the other grecords their shots. The objective of the game is to destroy player's ships.  Before play begins, each player secretly arranges their ships on grid. Each ship occupies several consecutive squares on the either horizontally or vertically. The type of ship determines squares for each ship. The ships cannot overlap (i.e., only one of given square in the grid). The types and numbers of ships a same for each player. Furthermore, he cannot see the other's some for each player, and the cross marks show the squares that splaced by the player, and the cross marks show the squares that specify the PEAS description for the above scenario. * Note: for of the actuator/sensor, e.g., hands (to write).  P:  Let	and The game is layer arranges yield, the player of the opposing of the number of can occupy any allowed are the ships.  The spainst them. The grey at their opponent has fired A and S, please briefly indicated.	y boxes are the ships upon.
S:		
Question 2 (1pt) Differentiate between a generated node and	d an expanded node.	

Student ID:		Duration: 15 mins	Date: 12/06/2023
Student name:			Score:/ 3
little boy, who plays M cells, with hidden min mine, it reveals the nu can determine cells t being mines can be n	Minesweeper on his computes randomly distributed. In the same of mines adjacent to hat are safe and cells that harked with a flag using t	rio. The agent being considered is a ter. The game board is divided into When he clicks on a cell without a this cell. Using this information, he t contain mines. Cells suspected of the right mouse button. To win, he my cell that contains a mine before	G Minesweeper
-		es of the above scenario. Do not forgetion will give you 0 credit for the correct Explanation:	sponding property.
O Single-agent	O Multi-agents	Explanation:	
O Stochastic	O Deterministic	Explanation:	
O Episodic	O Sequential	Explanation:	
	hat is the maximum numb n a chess board of size 4x4	er of successors that can be generat ? Explain.	ed from any state of the

Student ID:	Duration: 15 mins	Date: 12/06/2023
Student name:		Score: /3
Question 1 (2pts) Consider the following scenario. little boy, who plays Minesweeper on his computer cells, with hidden mines randomly distributed. When it reveals the number of mines adjacent to this cel determine cells that are safe and cells that contain mines can be marked with a flag using the right mopen all the cells without clicking on any cell that out.	The game board is divided into he clicks on a cell without a mine, l. Using this information, he can mines. Cells suspected of being ouse button. To win, he needs to	G Minesweeper _
Specify the PEAS description for the above scenario. * of the actuator/sensor, e.g., hands (to write).	Note: for A and S, please briefly ind	icate the functionalities
P:		
E:		
A:		
S:		
<b>Question 2 (1pt)</b> What is the maximum number of Knight tour problem on a chess board of size 8x8?	_	·

### **SOLUTION**

Student ID:		Duration: 15 r	nins	Date: 12/06/2023
Student name:				Score:/ <u>3</u>
considered is a little be played on four grids, to ships and records the records their shots. To player's ships.  Before play begins, each grid. Each ship occupied their horizontally or squares for each ship. Given square in the grown same for each player. It	consider the following scere toy, who plays Battleship with two for each player. On one go shots by the opponent. On the objective of the game is the player secretly arranges the ies several consecutive square vertically. The type of ship do The ships cannot overlap (i.e., rid). The types and numbers Furthermore, he cannot see the	h his friend. The game is grid, the player arranges he other grid, the player to destroy the opposing eir ships on their primary es on the grid, arranged etermines the number of only one can occupy any of ships allowed are the ne other's ships.	A B C 1	
_	vs a map of one player's ships nd the cross marks show the s	=		· ·
· -	ask environment properties of lote that a wrong explanation			-
O Fully observable		Explanation: One agent	cannot acce	ess the other agent's
grids and thus he has p	partial information about the g	game environment		
O Single-agent friend, and thus his frie	<ul> <li>Multi-agents</li> <li>end is an agent that may affect</li> </ul>	<b>Explanation:</b> The little the little boy's behaviors.		
<b>⊙</b> Stochastic	O Deterministic os precisely. They need to perf	Explanation: The little b	oy, as well a	as his friend, cannot
O Episodic	<b>⊙</b> Sequential	Explanation: If a shot hi	ts some ship	o, the rational agent
will attack adjacent cel	ls instead of continuing to sho	oot randomly.		
A frontier is a data stru priority queue, depend	at is a frontier? How do you into the state of the stores nodes that a ling on which search strategy in the st	are waiting to be expanded is used.	. It can be a	queue, a stack, or a
A trontier in BFS is a FI	FO queue.			

Student ID:	Duration: 15 mins	Date: 12/06/2023
Student name:		Score:/ <u>3</u>
Question 1 (2pts) Consider the following scenario. Considered is a little boy, who plays Battleship with his frightly on four grids, two for each player. On one grid, the ships and records the shots by the opponent. On the other records their shots. The objective of the game is to dest player's ships.  Before play begins, each player secretly arranges their ships grid. Each ship occupies several consecutive squares on the either horizontally or vertically. The type of ship determines a for each ship. The ships cannot overlap (i.e., only one given square in the grid). The types and numbers of ships same for each player. Furthermore, he cannot see the other	iend. The game is e player arranges or grid, the player roy the opposing s on their primary he grid, arranged nes the number of ne can occupy any s allowed are the	B C D E F G H I J  X
The above figure shows a map of one player's ships and the placed by the player, and the cross marks show the squares	_	
Specify the PEAS description for the above scenario. * Note: f of the actuator/sensor, e.g., hands (to write).	or A and S, please briefly in	dicate the functionalities
P: Destroy all the the opposing player's ships before losing a	all one's own ships	
E: Must have: Four grids (two for each player), pens, oppon	ent	
A: Must have: Hands (to record the shots), mouth (to annou	unce the attacked cells)	
S: Must have: Eyes (to view the grids), ear (to hear the infor	mation of attacked cells)	

**Question 2 (1pt)** Differentiate between a generated node and an expanded node.

A generated node is a newly-created node, which is the successor of a node selected for expansion. This node will go to the frontier if satisfying some given constraints. Meanwhile, an expanded node is a node popped from the frontier and then we generate its successors; in graph-search, it is further marked for not visiting it again.

	. ,		
Student ID:		Duration: 15 mins	Date: 12/06/2023
Student name:			Score:/ <u>3</u>
little boy, who plays Mels, with hidden mir mine, it reveals the nuclean determine cells the being mines can be n	Minesweeper on his comput nes randomly distributed. V Imber of mines adjacent to hat are safe and cells that narked with a flag using th	io. The agent being considered is a er. The game board is divided into When he clicks on a cell without a this cell. Using this information, he contain mines. Cells suspected of he right mouse button. To win, he my cell that contains a mine before	Game Help  1
,	• •	s of the above scenario. Do not forget on will give you 0 credit for the corres	• , ,
O Fully observable	Partially observable	Explanation: Though the boy	can choose any cell to
open, hints for next m	oves are revealled partially	during the game, he cannot get all hi	nts at the beginning
<b>⊙</b> Single-agent	O Multi-agents	Explanation: This is a single-pla	yer game
O Stochastic	Deterministic	Explanation: <u>Each number su</u>	
		ve cannot be random.	
However, we have no	clue for the first move, and	thus it is still ok if you choose Stocha	STIC.
O Episodic	Sequential	Explanation: <u>Cells are opened g</u>	radually in several steps
	nat is the maximum numben a chess board of size 4x4?	er of successors that can be generate? Explain.	ed from any state of the
It depends on the sta	te representation.		
Assume that we use t	he complete-state formulati	ion, in which each column contains a	single queen. Then, the
number of successors	from any state is 12 success	sors.	
Explanation: each que	en has three choices for th	e next move (except the current cell	), and we can move only

Student ID:Student name:	Duration: 15 mins	Date: 12/06/2023 Score:/_3
Question 1 (2pts) Consider the following scenario. The little boy, who plays Minesweeper on his computer. The cells, with hidden mines randomly distributed. When he it reveals the number of mines adjacent to this cell. It determine cells that are safe and cells that contain mines can be marked with a flag using the right mount open all the cells without clicking on any cell that contout.	he game board is divided into clicks on a cell without a mine, Ising this information, he can nines. Cells suspected of being se button. To win, he needs to	Game Help  Game Help  1
Specify the PEAS description for the above scenario. * No of the actuator/sensor, e.g., hands (to write).  P: Open all the cells without clicking on any cell that co		
E: Must have: Computer with screen and mouse, a ga	ime board with numbers, mines	, flags, and unrevealed
A: Must have: Hands (to click the mouse)		
S: Must have: Eyes (to observe the board)		
<b>Question 2 (1pt)</b> What is the maximum number of su Knight tour problem on a chess board of size 8x8? Ex	<u> </u>	l from any state of the
The maximum number of successors is 8. It is when the moves in 8 different directions		

