Course's Name : Artificial intelligence
Course's Number : 12140532
Questions' Number : 1
Total Mark : 10
Time: 07/08/2024-15/08/2024

Palestine Technical University -Kadoorie

Assignment #1
Semester two 2023-2024

Instructor's Name: Dr. Mohammed Khalil.

Student's Name: _____

Student's Number: _____

Section's Number: _____

Question	Points	Outcomes	Question Grade	Required time minutes
Q1			10	
Student Grade				

تعليمات مهمة:

1. يجب ارسال الكود كنص حتى استطيع تجربته والتأكد منه.
2. يجب ان يعمل الكود مهما كان توزيع الاحرف الستة.*(مع العلم انه تم اختيار توزيعة الاحرف التالية لأغراض التقييم)*
3. يجب ان ترفق ملف يشرح عمل كل الدوال بطريقتك الخاص وباللغة التي تريد بالإضافة الى صور تنفيذ البرنامج لأكثر من حل.
4. احرص عزيزي الطالب على تسليم حلولك الخاصة وعدم مشاركة اجاباتك مع اي طالب اخر.
5. التزم بكل التعليمات السابقة، لإنها ستكون ضمن معايير التقييم.

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Question #1: _____ (10 Points)

Knight's Tour

The updated Knight's Tour challenge involves starting with an 8x8 board where each square is either empty or contains one of six unique letters based on your first and last name. In each move, a letter can be moved to an adjacent empty square (excluding diagonals). The objective is to use Breadth-First Search and Depth first search algorithms to rearrange the letters on the board in such a way that a knight can visit all the squares containing letters.
Here is an example: Student Name: **Omar Kh**a**l**il
initial state:

	O						
		M		K			
	A						
				H			
							L

Note:

1) *Define the initial state in the main method as shown in the example above.*
2) *The starting point must be a letter entered by the user.*
3) *Passing through spaces is not allowed.*
4) *Passing through the letters multiple times is not allowed.*

Your program must output:

1. Your first name, your last name, and the first six unique letters derived from them.
2. For DFS and for BFS, the solution must be printed as follows:
   1) The goal state achieved using each search algorithm.
   2) Sequence of steps, each on a separate line as shown in the example below.
   3) The number of states expanded using each search algorithm.

For example:
Student Name: **Omar Kh**a**l**il
First six unique letters are: **O M A K H L**

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Student's Name: _____

Student's Number: _____

Section's Number: _____

Algorithm: *DFS.*
One of the goal states:

	O						
			K				
A					H		
	M					L	

Solution

move M down
move A Left
.
.
.
move H up

Start point in this goal-state could be M or L

Number of expanded states:*.22*

Algorithm: *BFS*

One of the goal states:

O		M					
				K			
	A						
					L		
						M	

Solution:
move O left
.....

Number of expanded states:
???

The End