TIC3151 - Artificial Intelligence

ASSIGNMENT (20%)

INSTRUCTIONS TO STUDENTS:

(i) The assignment is to be completed in a group of maximum 4 students.

(ii) If plagiarism is detected, the assignment shall be graded as 0%.

(iii) You are not allowed to acquire help from the tutor or lecturer to debug/fix your program codes.

(iv) Submit both the detailed write-up (in powerpoint format) and the program source code.

(v) Deadline is week 12, Friday 12pm. No extension is allowed.

(vi) Presentation of your work shall be scheduled in Week 13.

(vii) For group leader, email your group work to `tic3151.mmu@gmail.com`. You must provide all the members' full names and student IDs.

PART A (Answer All)

1. (2 points) Discuss in detailed any Five(5) domains where Artificial Intelligence(AI) can be applied. Examples of domain are *banking*, *insurance*, *education*, *military*, *business* and many more. To be specific, perform literature review and produce the following tables:

   (i) A list of authors with the challenges/problems they solved.

   (ii) A list of authors with the AI techniques they applied in the domain problems they solved.

   Your literature work must be recent, not older than 2015.

2. (8 points) Solve a vacation planning problem using Constraint Satisfaction Problem using the following criteria. Your goal is to optimize your vacation experience with fixed amount of money and fixed duration. You must have a list of parameter constraints clearly defined.

   (i) you have a fixed amount of money.

   (ii) you can stay in hotels with specific star rating.

   (iii) you can eat food of price range.

   (iv) you can visit minimum of 2 tourist spots.

   (v) you can travel in any kind of transportation you preferred, but within certain budget.

PART B (choose one only)

1. (10 points) Code the following search algorithms into a microbit robot. The problem space can be a simple maze.

   (i) Depth-First Search

   (ii) A* Search

   [note: Provide a detailed step-by-step handout of how to use your program. You can use as many sensors as you want.]

2. (10 points) Solve a vacation planning problem using Genetic Algorithm the following criteria. Your goal is to optimize your vacation experience with fixed amount of money and fixed duration. You must have a list of parameter constraints clearly defined.

   (i) you have a fixed amount of money. You can define your own limit.

   (ii) you can stay in hotels with any star.

   (iii) you can eat food of any price.

   (iv) you can visit as many tourist spots as you want.

   (v) you can travel in any kind of transportation you preferred.

   [note: make sure that all parameters can easily modified in your program. You should provide a visualization for your work. Discuss your work in step-by-step manner.]