Artificial Intelligence
ECE 412C

Benha University

Computer Systems Engineering
Electrical Engineering Department

Faculty of Engineering
(at Shoubra)

Semester Project

Problem Statement:

Using your favorite programming language, apply what you have learned during Artificial Intelligence course to **design** and **implement** a rational agent for solving a real life problem of your choice.

Suggested Problems[1] (more details are available upon request**):**

1. Herbert[2] is a robot that can be programmed in a language called "h"[3] to press all the white buttons on a grid while dealing with obstacles such as walls and gray buttons. "h" is a simple but powerful language that contains elements of traditional high-level languages: statements, procedures, parameters, arguments, and recursion. However, "h" is syntactically more simple, and contains some concepts (procedural arguments) that are not found in traditional languages. Herbert challenges the ability to see patterns and create algorithms to produce these patterns. **Design** and **implement** a rational agent that can program Herbert in "h".

2. The Eternity II puzzle[4], aka E2 or E II, is an edge-matching puzzle competition which was released on 28 July 2007. It was published by Lord Christopher Monckton, and is marketed and copyrighted by TOMY UK Ltd. A $2 million prize was offered for the first complete solution. The competition ended at noon on 31 December 2010, with no solution being found[5]. **Design** and **implement** a rational agent that can solve edge-matching puzzles (and hopefully E2).

Deliverables (in electronic form**):**

1. A detailed report covering:
   a) *Task environment*
   b) *Structure of agents*
   c) Used *techniques*
   d) Results and comparison
2. Complete source code (in a ready to work state)
3. Presentation Slides

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1 Suggestions are welcome.
2 Try it online here: https://herbert.wildnoodle.com/
3 http://wildnoodle.fasttrackteam.com/UI/Compete/Tutorial.aspx?CId=51Z120AjBcN/RjM5pstwlA==
4 https://en.wikipedia.org/wiki/Eternity_II_puzzle
5 Try a small version online here: http://www.playzgame.com/online-flash-games/Eternity-II.php

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Timeline:

- Checkpoint (one week before the midterm exam)
- Final Evaluation (one week before the final exam)

Grading:

The project is worth **25 points** distributed as follows:

- Design   (**10** points)
- Implementation   (**10** points)
- Presentation   (**05** points)

Groups:

Groups of **three to five** students are allowed.

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Good Luck
Dr. Islam ElShaarawy

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