CCT College Dublin Continuous Assessment

Programme Title:	*BSc (Hons) in Computing and IT Y4*		
Cohort:	*Y4*		
Module Title(s):	*Artificial Intelligence* *Data Visualisation & Comms*		
Assignment Type:	*Individual*	**Weighting(s)**:	*40% (AI)* *50% (Data Vis and Coms)*
Assignment Title:	*AI_DV _Lv8_ICA_v5*		
Lecturer(s):	*David McQuaid* *Sam Weiss*		
Issue Date:	*4th December 2023*		
Submission Deadline Date:	*5th January 2024*		
Late Submission Penalty:	Late submissions will be accepted up to **5** calendar days after the deadline. All late submissions are subject to a penalty of **10%** of the mark awarded. Submissions received more than 5 calendar days after the deadline above **will not** be accepted and a mark of 0% will be awarded.		
Method of Submission:	**Moodle**		
Instructions for Submission:	*Assessment must be submitted before 11.55pm 5th January 2024 as a Jupyter Notebook file and a Word Document (No PDF's)* ● *The Jupyter Notebook File Must be saved as "YourName_AI_DV _ICA.ipynb"* ● *Word Document with report detailing rationale, including visualisations "YourName_AI_DV _ICA.docx"* ● *Do NOT Zip Your Solutions All files must be uploaded seperately*		
Feedback Method:	**Results released on Moodle**		
Feedback Date:	*After Exam Board Feb 2024*		

Learning Outcomes:

Please note this is not the assessment task. The task to be completed is detailed on the next page.
This CA will assess student attainment of the following minimum intended learning outcomes:

Artificial Intelligence

MLO 2 - Distinguish the different agents and environments of current Artificial Intelligence, being aware of consideration to perception / action and potential changes to the environment.
(Linked to PLO 2 (Stage 4 SLO 2))

MLO 3 - Understand the differences and challenges involved in developing different levels of Artificial Intelligence (Linked to PLO 3 (Stage 4 SLO 3))

MLO 4 - Identify and apply an appropriate problem-solving strategy in relation to search, non-classical search, Adversarial Search, Constraint Satisfaction Problem.
(Linked to PLO 5 (Stage 4 SLO 5))

Data Visualisation & Comms

MLO 1 - Explain the concepts, techniques and processes underlying data visualisation
(Linked to PLO 1 (Stage 4 SLO 1))

MLO 4 - Propose, design, develop, and implement data visualisation solutions.
(Linked to PLO 4 (Stage 4 SLO 4))

MLO 5 - Display effective presentation skills to communicate with peers, team members and project stakeholders.
(Linked to PLO 3, PLO 6 (Stage 4 SLO 3, SLO 6))

Attainment of the learning outcomes is the minimum requirement to achieve a Pass mark (40%). Higher marks are awarded where there is evidence of achievement beyond this, in accordance with QQI *Assessment and Standards, Revised 2013*, and summarised in the following table:

Percentage Range	**CCT Performance Description**	**QQI Description of Attainment** **Level 6, 7 & 8 awards**
90% +	Exceptional	Achievement includes that required for a Pass and in **most** respects is significantly and consistently beyond this
80 – 89%	Outstanding	
70 – 79%	Excellent	
60 – 69%	Very Good	Achievement includes that required for a Pass and in **many** respects is significantly beyond this
50 – 59%	Good	Achievement includes that required for a Pass and in **some** respects is significantly beyond this
40 – 49%	Acceptable	Attains all the minimum intended programme learning outcomes
35 – 39%	Fail	Nearly (but not quite) attains the relevant minimum intended learning outcomes
0 – 34%	Fail	Does not attain some or all of the minimum intended learning outcomes

Assessment Task
Students are advised to review and adhere to the submission requirements documented after the assessment task.

Tasks for Artificial Intelligence

Ciara is looking for employees for her new company, which develops and provides AI based logistic software for retailers. Ciara has determined that she needs:

2 Python Programmers, 2 AI Engineers, 1 Web Designer, 1 Database Admin, and 1 Systems Engineer. Assume that if a person has two abilities, he or she can take on two roles in the company.

So Ciara narrowed down her selections to the following people:

Name	**Abilities**
Peter	Python and AI
Juan	Web and AI
Jim	AI and Systems
Jane	Python and Database
Mary	Web and Systems
Bruce	Systems and Python
Anita	Web and AI

Scenario 1:

Suppose Ciara knows Python, and only has funds to hire three more people.

Scenario 2:

Suppose Ciara and Juan become partners, with the additional funds they can now employ four more people but must employ another AI Engineer, so they need 2 Python Programmers, 3 AI Engineers, 1 Web Designer, 1 Database Admin, and 1 Systems Engineer.

1. Using any CSP (Constraint Satisfaction Problem) framework (using variables, value domains, and constraints), discover if the above problems can be solved and if so detail who would be in hired**.[0-30]**
2. Discuss in detail how using Constraint Satisfaction finds an answer or finds no solution to the problems in Tasks for Artificial Intelligence part 1. How does this differ from standard algorithmic solutions? .[**0-30**]
3. These problems be solved using several other algorithm's we have studied in the module. Choose one of these algorithms and discuss your answer in detail including a proof of your hypothesis in code **.[0-30]**
4. Support your arguments with citations/references in Harvard Style **.[0-10]**

Tasks for Data Visualisation

- Use appropriate visualisations to help communicate the CSP scenario and the corresponding solutions, if any, to the appropriate stakeholders.
- Create interactive visualisation(s) to allow a user to explore alternate constraint scenarios

- Create GUI(s) to allow a user to explore alternate constraint scenarios
- Include in your report a section for a theoretical AI "team" you are part of, explaining the visualisation processes and rationalising your visualisation decisions (eg chart choice, colour, layout etc).

Data Visualisation Marks

Task	Marks
CSP Visualisations	**35**
Alternate Scenarios - Interactive Visualisations	**15**
Alternate Scenarios - GUI	**20**
Visualisation Processes	**15**
Visualisation Rationale	**15**

Submission Requirements

All assessment submissions must meet the minimum requirements listed below. Failure to do so may have implications for the mark awarded.
All assessment submissions must:

- Be submitted before **11.55pm** *5th January 2023* as a Jupyter Notebook file and a Word Document (No PDF's).
- The Python Jupyter Notebook File Must be saved as "YourName_AI_DV_ ICA.ipynb".
- Word Document with report detailing rationale, including visualisations "YourName_AI_DV_ ICA.docx"
- Be submitted by the deadline date specified or be subject to late submission penalties
- Be submitted via Moodle upload
- Use Harvard Referencing when citing third party material
- Be the student's own work.
- Include the CCT assessment cover page.

Additional Information

- Lecturers are not required to review draft assessment submissions.
- In accordance with CCT policy, feedback to learners may be provided in written, audio or video format and can be provided as individual learner feedback, small group feedback or whole class feedback.
- Results and feedback will only be issued when assessments have been marked and moderated / reviewed by a second examiner.
- Additional feedback may be requested by contacting the Lecturer, Additional feedback may be provided as individual, small group or whole class feedback. Lecturers are not obliged to respond to email requests for additional feedback where this is not the specified process or to respond to further requests for feedback following the additional feedback.
- Following receipt of feedback, where a student believes there has been an error in the marks or feedback received, they should avail of the recheck and review process and should not attempt to get a revised mark / feedback by directly approaching the lecturer. Lecturers are not authorised to amend published marks outside of the recheck and review process or the Board of Examiners process.
- Students are advised that disagreement with an academic judgement is not grounds for review.
- For additional support with academic writing and referencing students are advised to contact the CCT Library Service or access the CCT Learning Space.
- For additional support with subject matter content students are advised to contact the CCT Student Mentoring Academy

- For additional support with IT subject content, students are advised to access the CCT Support Hub.