UOW MALAYSIA KDU PENANG UNIVERSITY COLLEGE

PART OF THE UNIVERSITY OF WOLLONGONG AUSTRALIA GLOBAL NETWORK

ASSIGNMENT COVER PAGE

Validated by: UNIVERSITY OF LINCOLN UNITED KINGDOM

Programme	**Course Code and Title**
Bachelor of Computer Science (Hons)	CAI3013/N Introduction to Artificial Intelligence
Student's name / student's id	**Lecturer's name**
	Dr. Robin Tan

Date issued	**Submission Deadline**	**Indicative Weighting**
Week 5 -27/2/2023	Week 10-7/4/2023	30%
Assignment 2 title	Jackson, the interactive egg incubator	

This assessment assesses the following course learning outcomes

# as in Course Guide	**UOWM KDU Penang University College Learning Outcome**
CLO3	Develop programs in an AI language, expert system shell or data mining tool
# as in Course Guide	**University of Lincoln Learning Outcome**
CLO2	Apply Artificial Intelligence techniques to solve practical problems

Student's declaration

I certify that the work submitted for this assignment is my own and research sources are fully acknowledged.

Student's signature: Submission Date:

Dates and Mechanisms for Assessment Submission and Feedback

Mechanism for handout to students	OpenLearning
Mechanism for submission of work by student	*Softcopy online submission via* OpenLearning
Date by which work, feedback and marks will be returned to students	19 April 2023
Mechanism for return of assignment work, feedback and marks to students	Feedback will be provided by a marking template. This will be available to students via OpenLearning. The discussions at the walkthroughs will also provide informal feedback.

COURSEWORK SUBMISSION GENERAL INFORMATION

Academic Integrity Statement

You must adhere to the university college regulations on academic conduct. Formal inquiry proceedings will be instigated if there is any suspicion of plagiarism or any other form of misconduct in your work. Students must **NOT** collude with other groups of students or plagiarize their work.

Nature of the submission required

A softcopy of your assignment in **PDF version** should be submitted to lecturer, no later than the date and time stipulated on the cover sheet. In addition, an electronic copy of your work must be submitted to Turnitin. The first page of your report, immediately after the cover page, must be a page from Turnitin clearly showing your name and your Originality Score (Please refer to submission arrangement).

Diagrams may be used to support your arguments or description. If they are not your own work, the source must be referenced. Please help us to handle and mark your work efficiently.

This is a group based assignment with maximum three members. Only **one submission per group**. This will contain both the group and individual elements. The individual element must be clearly labelled to indicate which group member completed the task. In the case of conflict occurred within the members, **Peer Assessment** form as attached could be used to highlight the issue. Marks will be adjusted based on the rationality of the statement.

Documentation guidelines

Student is required to submit a **SOFTCOPY** of the report and ensure that it use the following formatted styles: 1) Font type: **ARIAL**, 2) Font size: **11 pt**., 3) Line spacing: **Single spacing** and 4) Page layouts: **Justify**. Please make sure you have proper format alignment for all paragraphs, following standard writing style and use **HARVARD CITATION STYLE** for citation. Please include a **HEADER** with the following information: **Student ID, Student name, Course code and Assignment type**. Please also include a proper cover page for your submission which contains information about the students, assignment, course, and department with UOW and University of Lincoln (UoL) logos on top. Also include page number and list of references.

Penalties for Late Submission

For late submission of this Assignment, a penalty of a reduction by 10% of the maximum mark may be applicable for each Calendar Day or part thereof that the submission is late. An Assignment submitted more than **TEN** Calendar Days after the deadline will have a mark of zero recorded for this Assignment.

Submission arrangement

1. Cover page
2. Turnitin similarity report
3. Table of Content
4. Main Report
5. Reference List or Bibliography List (whichever applicable)
6. Marking Rubric (in landscape orientation)

Assignment instructions/Background

ASSESSMENT MODE: Group of maximum three members

AIM

To develop an interactive Jackson chat-bot.

OBJECTIVES

To investigate a suitable platform to support a chat-bot user interface;
To obtain and analyze the sunflower growing conditions and weather information from various resources;
To apply appropriate AI algorithms to develop a chat-bot by using Python programming;
To explain the structure and AI algorithms supporting the chat-bot.

BACKGROUND

Industry Revolution 4.0 (IR4.0) changes the practices in many industries to cope with the challenges and uncertainties in the market. The evolution has been accelerated since the beginning of the COVID-19 pandemic. Implementation of many restrictions in one hand helps to fight the pandemic, but on another hand interrupts the balance of demand and supply. Farming industry, which is mostly labour intensive, is one of the most affected industries in this period.

The idea of smart farming could be practiced to minimize the impact of pandemic through mechanism in IR4.0. Farm management could be automated with the application of Internet of Things (IoT) and cloud computing technology to collect real-time data and connect sensors with smart machines. The management would be data-driven based and AI algorithms could be used to improve the efficiency of the management. While agriculture remains as one of the most important economic sectors in Malaysia, you wish to contribute your skills in helping local farmers

in upgrading their efficiency. You wish to create a user-friendly chat-bot that may help farmers in dealing with challenges in egg hatching.

Part 1: Design of the egg incubating chat-bot, Jackson.

A chat-bot is an application with Natural Language Processing (NLP) as a backbone. It simulates human conversation over a social media like Discord, Telegram, Facebook and has gained much attention in the recent years especially from e-commerce sector. In this assignment, you need to develop a chat-bot namely Jackson that acts as an automated egg incubating advisor to interact with users in the natural language. Your task is to design Jackson to seamlessly chat with users and attract their attention getting closer to the nature in the interesting way. Your work will be supported by user inputs and real time database measured from a physical egg incubator as follows:

1. Identify different types of egg and provide advices on good practices on hatching the eggs;
2. Monitor real-time egg incubating conditions like temperature, humidity, turning of eggs and duration of batch incubating;
3. Attract user to observe the hatching process via user-friendly GUI.

Your work is illustrated in **Figure 1** in which will be supported by the information obtained from various websites. Skill on web scrapping and using APIs are necessary. You may also interview human experts to enrich Jackson's knowledge base. Appropriate AIML algorithms are expected to be implemented to make Sunny intelligent. Fuzzy logic, especially must be implemented to improve the agility of the system. You may also include other AI algorithms such as linear regression, decision tree, genetic algorithm, neural-networks and perhaps search algorithms. You need to indicate which algorithm you used and how you implement it in the system.

This is a group assignment. You are expected to produce a report of 8 to 12 pages and a chat-bot program written in Python language. Marks will be allocated based on the components on the marking rubrics as attached. It is advisable to follow a proper citing method such as Harvard referencing method as it may affect the total marks.

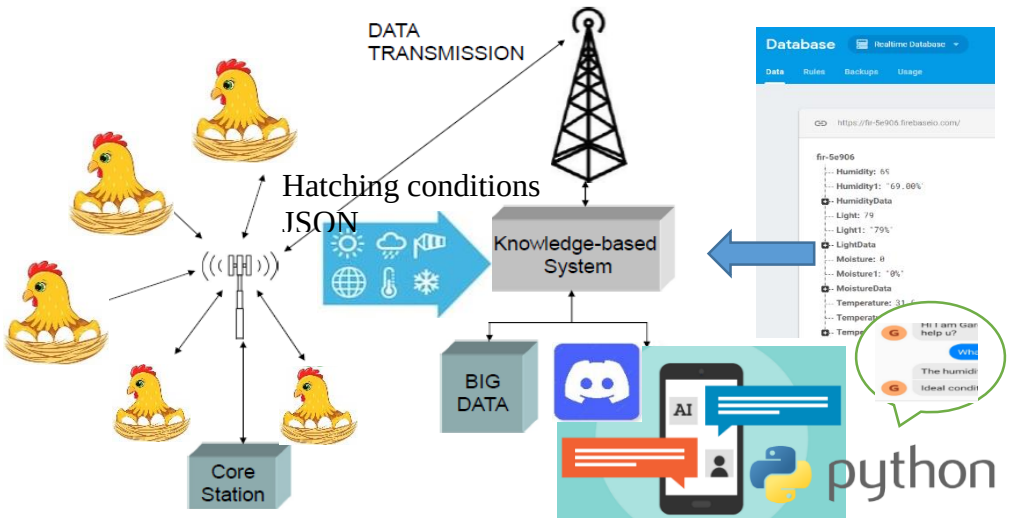

Figure 1: Structure of an egg incubating chat-bot, Jackson

(60 marks)

Part 2: Oral presentation of chat-bot and demonstration.

The assignment also requires student to conduct oral presentation based on works in developing the chat-bot. You are expected to produce your own PowerPoint presentation slides. Each group member will be allocated 5 minutes for the presentation, followed by Q & A session. Presentation ends with demonstration to show functionality of the chat-bot.

Students should NOT collude with other students or plagiarize their work. Appropriate action will be taken, according to UOWM KDU Penang University College regulations, if collusion or plagiarism is suspected. Evidence of academic misconduct will be taken seriously and University College regulations followed. You are advised to be familiar with the University College definitions of plagiarism and collusion.

(40 marks)

CAI3013/N

Introduction to Artificial Intelligence (AI)

MARKING RUBRIC
ASSIGNMENT (30%)

PROGRAMMING COMPONENT (60 %)

	MARKING CRITERIA	SCALE					YOUR MARKS/COMMENTS
		Fail (0-49)	**3rd Class (50-59)**	**2nd Lower Class (60-69)**	**2nd Upper Class (70-79)**	**1st Class (80-100)**	
CLO3 Develop programs in an AI language, expert system shell or data mining tool	**1. Program interface and output quality (User friendliness, Error free during runtime) (12%)**	Program does not able to compile.	Program executed with runtime error but achieve partial program requirements. Basic program interface is presented	Program executed error free with limitations to achieve minimum program requirements. Program interface is adequately presented.	Program executed error free with correct output and achieve all program requirements. Program interface is presented well.	Program executed error free with excellent output with appropriate validation. Program interface is attractive and easy to use.	
	2. Algorithm design (18%)	Choice of AI algorithm used is not stated Does not demonstrate any proper use of flow chart/ pseudo code.	Choice of AI algorithm used is stated but does not match with flow chart. Demonstrate use of flow chart/ pseudo code with partial program requirements.	Choice of AI algorithm used is stated and reflected on flow chart. Demonstrate use of flow chart/ pseudo code with 60%-69% of program requirements achieved.	Choice of AI algorithm used is state and reflected on flow chart. Demonstrates proficiency in use of flow chart/ pseudo code that covers 70%-79% of program requirements.	Choice of AI algorithm used is justified and reflected on flow chart. Demonstrates mastery in the use of flow chart/ pseudo code and achieved all program requirements.	
	3.Coding quality (15%)	Very poor coding which is hard to understand. Little use of comments. Poor naming of almost all classes, methods and variables.	A poor attempt; which may be several problems with structure, or very little use has been made of comments, or the naming of classes, methods and variables is unsatisfactory in a significant number of cases.	A poor attempt; which may be several problems with structure, or very little use has been made of comments, or the naming of classes, methods and variables is unsatisfactory in a significant number of cases.	Generally, a good attempt, making use of comments, and where the majority of classes, variables and methods have been appropriately named. Need improvement on coding efficiency	Good use of commenting throughout the majority of classes, methods and variables. Efficiency in coding.	
	4. Documentation (15%)	The report writing does not meet the criteria for the assignment (too short or incomplete, too long, and/or completely off-topic). No conclusion on the work. Reference section is missing.	Many ideas require clarification and/or are off-topic or have marginal relevance to the assignment. Many grammatical and/or spellings errors throughout the paper. The paper is very challenging to read due to poor writing flow. Poor conclusion and improper reference section	Ideas are stated clearly and are related to the topic, with only adequate grammatical and/or spelling errors. Adequate conclusion is shown and reference section with minor flaws	Most ideas are stated clearly and are related to the topic, with only minor grammatical and/or spelling errors. Good conclusion that reflected the work. Reference section is in properly formatted.	Writing is clear and relevant, with no grammatical and/or spelling errors – polished and professional. Exceptionally good conclusion that reflected the work. Reference section is properly formatted.	
						Total (60%)	

	PRESENTATION COMPONENT (40 %)						
CLO3 Develop programs in an AI language, expert system shell or data mining tool	**MARKING CRITERIA**	**SCALE**					**YOUR MARKS/COMMENTS**
		Fail (0-49)	**3rdClass (50-59)**	**2nd LowerClass (60-69)**	**2nd UpperClass (70-79)**	**1stClass (80-100)**	
	1.CONFIDENCE (Ability to interact with audience and answer the question) **(10%)**	Lack of audience awareness; mismatch for the intended reader Writer lacks a sense of involvement; flat; lifeless Unable to answer the question from audience.	Limited sense of audience; doesn't acknowledge needs of reader Little commitment to topic Answer does not address the question adequately	Shows some awareness of audience Presentation is committed but inconsistent Answer to the question is acceptable.	Presenter recognizes audience; Committed to topic; Appropriate point of view; shows some originality in answering audience question.	Presenter quickly engages audience with strong interaction. Strongly committed to topic which comes to life Answer provided is justifiable and convincing.	
	2. PRESENTATION SLIDES (The usage of vocabulary) **(5%)**	Limited vocabulary Misused words interfere with meaning Inadequate, imprecise terms or expressions; fails to communicate message	Colorless, generic vocabulary Expressions may impair understanding; monotonous repetition Inappropriate; unimaginative terms or slang detract from message	Appropriate but ordinary vocabulary Functional expressions; may have some fine moments Terms convey message but passive verbs or clichéd expressions may interfere	Accurate, precise vocabulary Purposeful, clear meaning but rarely experiments with language Words convey the intended message	Powerful, varied, broad range of vocabulary Thoughtfully placed terms or expressions Words effectively communicate message in an interesting, precise, and natural way	
	3. EXPLANATION & MESSAGE DELIVERING (Explain, using the vocabulary of problem solving, how you came to be able to find, interpret and use the hidden code) **(15%)**	Explanation is predominantly a description of methods adopted and contains no reference to the concepts and principles used in the module. No examples of concept application are provided. The code snippet is not understandable.	Explanation contains only sparse reference to the concepts and principles used in the module. Examples of concept application are applied correctly but the application of context may be limited. The code snippet is largely understandable, but it is not clear how the hidden code is incorporated and used inside the code snippet.	Explanation uses less than a third of the key concepts and principles and is supported by appropriate examples correctly applied. The code snippet is understandable, but it is not clear how the hidden code is incorporated and used inside the code snippet.	Explanation uses between a third and two thirds of the key concepts and principles. Numerous correct supporting examples are appropriately applied. The code snippet is understandable and uses the hidden code correctly.	Explanation is a lucid account that deploys a rich vocabulary to illuminate the problem solving process succinctly and it refers to the majority of concepts and principles that have been delivered in the module. Supporting examples are well chosen. The code snippet is clear and concise and uses the hidden code correctly.	
	4. DEMONSTRATION (Demonstrate and provide a commentary on your contribution to the work) **(10%)**	Program is not working No evaluation of personal contribution of works	Program partially working. The evaluation of personal contribution is largely a 'whitewash' that suggests little reflection on work.	Majority of program works properly. The evaluation of personal contribution presents both good and bad points. Some content hints at future group engagement.	Program works well The evaluation of your personal contribution is well considered and presents both good and bad points. Some content hints at future group engagement.	Program works well. The evaluation of personal contribution is well considered and presents both good and bad points. Further it identifies possible strategies for future group engagement that reflect your identified strengths and weaknesses.	
						Total (40%)	
						Total (100%)	

Peer Assessment

Peer assessment to be completed by student () [please tick in the relevant criteria column]

Name of student being evaluated:					
Evaluated by:					
Score	2	4	6	8	10
Criteria	Unsatisfactory	Poor	Satisfactory	Good	Excellent
Contribute to group activities; Trusts, supports, and respects other team members; Working for consensus on decisions and attempts to resolve conflict rather than promote it; responsible					
Rationale – What is the justification for the above?					
Justification for the marks:					