

**ITI109 Application Development Using AI Service Assignment****Individual work (Total 45marks. Weightage 45%)****Instructions**

1. There are two sections in this assignment. Sections A and B are **INDIVIDUAL** work.
2. This assignment constitutes a total of 45% of your ICA for this module.
3. This assignment must be submitted to Politemall by **5-Jan-2025, 2359hrs.**
4. Submissions via other means, such as emails, will **NOT** be accepted.
5. Only one submission (the latest) will be used for marking.
6. Any learner caught plagiarising from other sources (friends, classmates, internet, etc.) will fail this module.

**Submission Requirements**

Please ensure that you submit the following as a single zip file and named with your admin number:

1. Python file including **comments** for each session. Eg. # Section A, Question 1
2. Excel file for QnA knowledge base.
3. Assignment word file included screen shot and write up.
4. Other files.

**Section A: Computer Vision (15m)****Background**

Company ABC faces inefficiencies in manually sorting fruits, leading to increased labor costs and inconsistent results. Variations in size, shape, and color, as well as lighting conditions, make manual classification challenging. To address this, you are required to build an automated classification system using Microsoft services exclusively, such as Azure Machine Learning and Cognitive Services. The solution must handle diverse fruit appearances and operate reliably in real-world conditions. This will enhance operational efficiency, accuracy, and cost-effectiveness. You are required to refer to ABC\_dataset.zip file for the fruit images.

- a. What are the required AI services for this image classification. Explain the usage of each of the AI services. (2m)
- b. Outline the steps involved in creating and training a custom vision model in Azure Vision Studio. (5m)
- c. Outline the steps involved in COCO (Common Objects in Context) file. (2m)
- d. Integrate custom model into app (2m). You are required to show your python code.
- e. Include a screenshot showing the performance of your trained model, along with an explanation of the results. (2 marks)
- f. Include a screenshot showing the performance of your testing image, along with an explanation of the results. (2 marks)

## Section B: Natural Language Processing

### Background

You are the part of the AI team in a company that sells a multiple range of food product targeted at the Asian market. Your company has an online-only presence and sells its products through a website that your company's IT team has created. The customer service is now handled by a team of customer service officers through an online chat software purchased by your company.

Your boss has assigned you to create a chatbot prototype to test the feasibility of offloading as much of the customer service enquiries and other operational-related work to a chatbot. You are required to use the Microsoft AI service for this chatbot generation.

In addition, as your company serves various countries in Asia, your boss expects that your chatbot is able to communicate any other Asian languages (for example, Chinese, Malay, Japanese, Korean, Tamil, Tagalog, Thai, or etc.). Given that you do not have additional manpower or resources to engage third party translators, you propose to make use of only Microsoft AI service in the initial feasibility phase. In this phase, you propose to test with at least ONE Asian languages.

### Part A: Build a chatbot in English (15 marks)

1. Write a brief description of what your company is selling here. (3m)
2. List some of the common questions that your chatbot will help to offload from your customer service colleagues. Please include at least 10 questions and answers in an excel (3m).
3. What are the required AI services for this chatbot. Explain the usage of each of the AI services. (2m)
4. Create a knowledge base in language studio. You are required to import the excel file created in PartA-Q2. Please provide the screenshot for the QnA pairs. (3m)
5. Test and publish the chatbot. You are required to show the necessary screenshot with at least 5 dialog scenarios. (4m)

### Part B: Build a chatbot in Multilanguage (15 marks)

By using the knowledge base that you generated in Part A. You are required to build your chatbot in at least 1 other Asian language. Your chatbot should be able to read in others language and return the answer in the same language.

The screenshot displays a chatbot interface with two parallel message boxes. The top box is in English, with the question 'Can I request for refund?' and a response detailing refund circumstances: 'Buyer may only apply for the refund in the following circumstances: • The Item has not been received by Buyer; • The Item was defective and/or damaged on delivery'. The bottom box is in Chinese, with the question '我可以要求退款吗?' and a corresponding response: '买方只都在以下情况下申请退款: • 买方尚未收到物品 • 物品在交付时有缺陷和/或损坏'.

1. State and explain what are the two benefits of generating a multilanguage chatbot for your business? (2m)
2. What are the extra AI services required for this Multilanguage chatbot. Assumption: The AI services that generated in Part A are still applicable. (2m)
3. Explain the procedure on how you could generate the Multilanguage chatbot with minimum cost. (3m)
4. Test and implemented the above chatbot. Please include the necessary screenshot for the generated cognitive service. You are required to submit the generated code in zip file. (2m)
5. You can improve your assignment by expanding the code in Part A and B to include some additional features. (6m)

Two possible suggestions are:

- (i) To incorporate speech-to-text in the code
- (ii) To incorporate text-to-speech in the code

The marking rubrics for this section is as follows:

**Impact [3 marks]**

- 3 marks - The additional feature(s) are likely to bring some positive impact to the business in reducing cost or increasing revenues.
- 2 marks - The additional feature(s) are likely to bring little positive impact to the business.
- 1 mark - The additional feature(s) are not relevant and have no impact to the business.
- 0 marks - Nothing implemented for this section.

**Degree of Difficulty in Implementation [3 marks]**

- 3 marks - The additional feature(s) use AI technology beyond the scope of this module and includes a significant portion coded on your own.
- 2 marks - The additional feature(s) use AI technology beyond the scope of this module supported with open-source libraries.
- 1 mark - The additional feature(s) use AI technology taught in the scope of this module, or develop small improvement.
- 0 marks - Nothing implemented for this section.

Please write a description of what you are attempting to do. The writeup is meant for the marker to understand your work, but it will not be graded.