Task 2 P: Case study on AI Solution and Fuzzy Logic

This document supplies detailed information on Assessment Task 2 for this unit.

Key information

- **Due: 17th March 2024, by 11.59 pm IST**

Learning Outcomes

This assessment assesses the following Unit Learning Outcomes (ULO) and related Graduate Learning Outcomes (GLO):

Unit Learning Outcome (ULO)	Graduate Learning Outcome (GLO)
ULO1: Explain the process and key characteristics of developing an AI solution, and the contrast with traditional software development, to inform a range of stakeholders.	**GLO1 -** through the assessment of student ability to use data acquisition. techniques to obtain, manipulate and represent data. **GLO2 -** through the assessment of communicating the results in specific format. **GLO3 -** through student ability to use specific programming language and modules to obtain, pre-process, transform and analyse data.

Part 1

Overview:

During week 1, you have explored the differences between traditional software development and intelligent systems and discovered what are the strengths and challenges of both traditional software applications and intelligent systems. We have provided you with some examples of AI solutions in different areas.

In this subtask you need to review a paper that discusses the recent advances in machine learning and its impact in software engineering. They have conducted a study on observing the software team at Microsoft developing AI-based applications. They collected some data to address the challenges within leveraging AI into different software applications. You need to review the attached paper and answer the following questions.

This subtask will help you to understand what are the recent advances in ML and how they are utilized in different software applications.

To do this subtask, you need to refer to Week 1 Olympus content.

Answer the following questions:

1. Review the attached paper and describe the main fundamental differences to building applications and platforms for training and building applications based on ML than we have seen prior in application domains. Summarize it into 3 points.

2. What are the main stages of machine learning workflow and explain each stage briefly. (Minimum 500 words)

3. Which domains within the Microsoft team have employed AI, and what machine learning approaches have they utilized?

4. What are the best practices with ML in software engineering? Provide a summary for each practice. (minimum 600 words)

Part 2

Overview:

In week 2, we have explored what fuzzy logic is and an example of a fuzzy system using Python is also discussed.

In this subtask, you need to find an application of fuzzy logic in a domain (e.g., how fuzzy technology can be applied to automatic train operation systems in the transportation domain) and submit a report outlining the application of fuzzy technology in that domain and how it can automate a task.

This will help you to understand how fuzzy logic in different domains works.

To do this subtask, you need to refer to Week 2 Olympus content.

- **In your submission for part 2, you need to prepare a report (in total 800 words) and explain detailed information of how Fuzzy technology works in the target domain/ application and discuss the flow of the system using fuzzy technology.**
- **In the report, you need to cover the following details:**

  1. What is the target domain and application?
  2. You need to explain how the fuzzy logic can fit into the target application. You need to discuss the advantage of using a fuzzy system in this domain/ application.
  3. You need to provide the flow or pipeline of the system using fuzzy technology.

4. You need to provide the rules that can be extracted from the fuzzy system in the domain / Application.

Submission details to Olympus:

- **Submit your answers as a PDF file into the Ontrack. Your answers must be relevant and precise. You need to submit one report, clearly demarcating Parts 1 and 2; adhering to the constraints mentioned in each part of the assessment.**

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