

BSc (Hons) in Information Technology

Year 4

Assignment –AI & ML

SE4010– Current Trends in Software Engineering

Semester 1, 2022

100 Marks (10% of the Total Grade)

Instructions

- This is an **individual** assignment. Your answers should not exceed more than 3 pages.
- Use your own words to describe your answers (Do not copy+paste)
- You can use google images/diagrams
- Name the answer sheet with your ID number and save in **pdf format**.
- The answer sheet should be verified through **Turnitin** and the generated report with similarity score should be submitted to courseweb assignment link. **Answer sheets without Turnitin score will not be marked.**
- Your deadline is **02/05/2022, 11.55 PM**

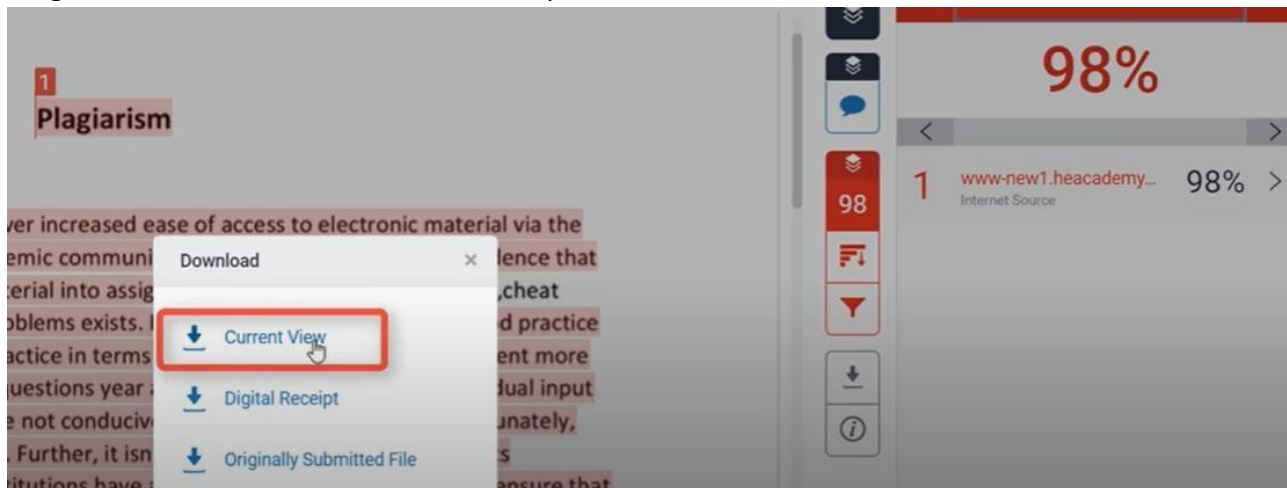
Use Turnitin

Please refer [this](#) video to create a Turnitin student account. Use following when in registration.

Class ID : 38375848

Enrollment Key : SE4010

Download the current view (Report with similarity) report and submit that report to courseweb ML assignment link. You can overwrite the reports until due date 13th March 2022.



Plagiarism Guidelines

The similarity score should be not more than 40. If more than 40, 50% will be reduced from the submission.

Question 1

Read the following **scenarios given below**.

- a. You are asked to build a machine learning model to predict what items should be placed together in a supermarket. The dataset that you have contains details of each of the bills that have been issued to customers over the last 3 years.
- b. NASA Scientists are training a robot to send to Mars. This robot is required to navigate to different locations that are assigned to it while avoiding/adapting to any situations that might occur during navigation and extract the sample from the given locations. you are tasked with training the navigation model.

For each scenario mentioned above, answer the following questions.

- I. Recommend a Machine Learning Model for the given scenario. (2 Marks *2)
- II. Justify the reasoning behind your recommendation. (8 Marks * 2)
- III. With a proper justification propose at least one other model/approach you can use to solve the given scenario. (5 Marks *2)

Question 2

Open the Titanic Dataset given in the Assignment link. This dataset is used to predict if a passenger survived or not from the sinking of the Titanic. Go through the dataset carefully and for each column indicate whether you believe,

- I. It should be selected or not for the final prediction with reasoning. (2 Mark *10)
- II. What are the different pre-processing/ feature engineering techniques that could be applied to each column. Justify the reasons why you believe it should be applied to the column. You can use statistics and visualization of the columns to justify your reasoning (5 Marks *10)

Note: You can use python libraries, Azure Machine Learning Studio or any other visualization/statistical analysis tools to answer the above questions. Additionally include the summary table given below to summarize your findings.

Column	Selected/Not Selected	Pre-Processing Technique
Pclass		
pName		

Grading Rubric

Description				Marks
Question 1 Part I	Student recommends the best approach/model for the given scenario 2 Marks	Partially correct AI/ML approach for the given scenarios. 1 Mark	Totally unrelated AI/ML approach for the given scenarios. 0 Mark	
Question 1 Part II Justify the reasoning behind your recommendation.	Critically analyze the scenario and provides substantial logical arguments to demonstrate the suitability of the recommended approach for the given scenario. 8 Marks	Average Justification for the selected approach with not enough information. 4 Marks	Poor justification with without a good understanding or reasoning to support the recommendation. 0 Marks	
Question 1 Part III With a proper justification propose at least one other model/approach you can use to solve the given scenario.	Clearly mention other approaches with a substantial analysis additionally, state the drawbacks of the alternate approach when compared with the recommended approach. 5 Marks	Mention other approaches without explaining. 2 Marks	Totally unrelated approaches. 0 Marks	

Question 2 Part I	Provides a correct recommendation with a valid reasoning. 2 Marks	Provides the correct recommendation but the reasoning is not adequate. 1 Mark	No valid reasoning provided. 0 Mark	
Question 2 Part II	At least one pre-processing requirement is mentioned with valid justifications. Student uses statistical/visual evidence to demonstrate why the identified pre-processing technique must be used. OR Student mentions with valid reasoning and evidence that no pre-processing should be done on the column. 5 Marks	Student identifies a correct pre-processing technique to use for the column, but fails to provide adequate justifications as to why it is required. 2 Marks	The preprocessing technique has not suitable or not required for the given column. 0 Marks	