Lab 7 - ML and AI

Completion Screenshot

Item 1 (10 Marks)

Reinforcement Learning Lab Completion Screenshot

Please add at least one screenshot of your final step in the lab report. The screenshot(s) should clearly demonstrate the completion of the lab task.

Item 2 (10 Marks)

AWS Comprehend Lab Completion Screenshot

Please add at least one screenshot of your final step in the lab report. The screenshot(s) should clearly demonstrate the completion of the lab task.

Item 3 - ML (40 Marks)

Read the following scenarios. Work with your peer to identify an ML solution for each scenarios.

Scenario 1
A bird watching society wants to train a computer system to recognize bird species. Amateur bird watchers have a hard time distinguishing between species. Can you create an application that will help them? What type of data would be needed? How would an algorithm or model work in this case?

Scenario 2
TRU is trying to forecast which games to schedule for the Sunday evening time slot. This game is the most watched and most important game of the week, and TRU wants to maximize viewers. TRU is able to flex game times every few weeks to change who plays in the game. Can you propose a model to use to select the best game that will attract the most viewers? What types of factors will TRU need to consider in its algorithm?
Remember to consider team factors, market factors, and anything else that could impact fans.
Scenario 3

A major credit card company wants to try to identify fraudulent purchases and alert consumers as soon as possible. Can you design a model that the bank can use to determine when a credit card purchase was probably fraud? What factors should be considered in the model?

Scenario 4

A healthcare company wants to help doctors make accurate diagnoses of rare diseases. This is very difficult because most doctors rarely or never see these types of cases. How can the health care system use data and ML to help? Can you propose a computer system that can help the doctors? How would it function?

Item 4 - Reinforcement Learning (40 Marks)

Read the following scenarios. Then identify which Amazon Web Services (AWS) resource you can use to address the issue. You might refer to the AWS Artificial Intelligence (AI) Services page (https://aws.amazon.com/ai/services) for more information about the available services.

AWS resources

- Amazon Personalize: https://aws.amazon.com/personalize/
- Amazon Forecast: https://aws.amazon.com/forecast/
- Amazon Rekognition: https://aws.amazon.com/rekognition/
- Amazon Comprehend: https://aws.amazon.com/comprehend/
- Amazon Textract: https://aws.amazon.com/textract/
- Amazon Polly: https://aws.amazon.com/polly/
- Amazon Lex: https://aws.amazon.com/lex/
- Amazon Translate: https://aws.amazon.com/translate/
- Amazon Transcribe: https://aws.amazon.com/transcribe/

Scenario 1

A historical research library system is trying to develop a new way to scan through thousands of ancient texts, and catalog them by keyword, type of resource, date, language, and many other features. Then they want the computer system to index them and send out notification to researchers with only the documents that they want for their historical specialty.
What machine learning (ML) functions would be used? What specific AWS services could be used?

Scenario 2

A school district wants to better serve students with visual disabilities. The district would like their computer systems to be able to read a variety of texts to the students. This includes digitally entered material, handwritten assignments, and historical documents in cursive writing. What ML functions would be used? What specific AWS services could be used?

Scenario 3

A smartphone company wants to partner with businesses and distributors of many products. They want the phone to be able to take an image of any product, and then understand what the product is. Then, the application could advise the user of the exact product name and direct them to a website to purchase it. What ML functions would be used? What specific AWS service could be used?

Scenario 4

The United Nations wants to use AI to help members communicate. When there is an international meeting, officials from dozens of nations who speak many languages will assemble. How can all these delegates speak to each other and write treaties they all understand? What ML functions would be used? What specific AWS services could be used?