INDIAN SCHOOL AL WADI AL KABIR

Class: X	**DEPARTMENT: COMPUTER SCIENCE** **SUBJECT:ARTIFICIAL INTELLIGENCE(417)**	**Date of Submission: 11/11/2026**
TOPIC: PORTFOLIO ACTIVITY ON ARTIFICIAL INTELLIGENCE		**To be written in the Practical Notebook**

1. Topic: Evaluating an AI Model Using a Confusion Matrix

Case Study

A school developed an Artificial Intelligence (AI) system to identify whether students were wearing their school ID cards while entering the school premises. The system was tested on 100 students.

The AI system predicted whether each student was wearing an ID card or not. The results were compared with the actual observations.

The following results were recorded:

- 40 students were actually wearing their ID cards, and the AI correctly identified 35 of them.
- 60 students were actually not wearing their ID cards, and the AI correctly identified 45 of them.
- The AI incorrectly identified 10 students without ID cards as wearing ID cards.
- The AI incorrectly identified 5 students wearing ID cards as not wearing them.

Answer the following questions using the given information.

Questions

Q1. Construct the confusion matrix for the given case study.

Q2. Calculate the number of True Positives (TP).

Q3. Calculate the number of True Negatives (TN).

Q4. Calculate the number of False Positives (FP).

Q5. Calculate the number of False Negatives (FN).

Q6. Calculate the Accuracy, Precision, Recall and F1 score of the AI model.

2. Topic: Natural Language Processing (NLP) – Text Normalization

Case Study

A school has developed an AI-powered chatbot to answer students' queries about school timings, holidays, and examinations. Students enter their questions using different writing styles, abbreviations, and punctuation.

The chatbot receives the following messages:

1. "WHAT are the school timings???"
2. "School timings"
3. "The School Timings are from 7:30 AM to 2:00 PM."
4. "Pls tell me the exam dates!!!"
5. "THE EXAM DATES ARE NOT ANNOUNCED YET."

Before processing these messages, the AI system performs text normalization to convert the text into a consistent format. This helps the chatbot process the messages more efficiently.

The chatbot applies the following steps:

- Removes extra spaces.
- Converts all letters to lowercase.
- Removes unnecessary punctuation.
- Expands common abbreviations such as "pls" to "please".

Questions

Q1. What is text normalization?

a) Converting text into images
b) Converting text into a consistent format
c) Translating text into another language
d) Deleting all words from a sentence

Q2. What will be the normalized form of the following text?
" WHAT are the school timings??? "

a) WHAT ARE THE SCHOOL TIMINGS
b) what are the school timings
c) What are the school timings???
d) what are the School Timings

Q3. Identify the text normalization technique used when all letters are converted into lowercase.

a) Tokenization
b) Stemming
c) Lowercasing
d) Lemmatization

Q4. What is the normalized form of the sentence below after expanding the abbreviation and removing punctuation?

"Pls tell me the exam dates!!!"

a) pls tell me the exam dates
b) Please tell me the exam dates
c) Please tell me the exam dates!!!
d) PLZ TELL ME THE EXAM DATES

Q5. Why is text normalization important in Natural Language Processing (NLP)?

a) It increases the size of text files.
b) It makes every sentence longer.
c) It helps make text consistent for processing.
d) It converts text into audio automatically.

Q6. Normalize the following sentence by converting it to lowercase and removing unnecessary punctuation:

"THE EXAM DATES ARE NOT ANNOUNCED YET."

Q7. Identify two text normalization techniques used in this case study.

Q8. Normalize the following text by removing extra spaces, converting it to lowercase, and expanding “pls” to “please”.

" PLS help me with the HOMEWORK!!! "

3. Topic: Computer Vision (CV)

Case Study: Smart Waste Segregation System

A school has introduced an AI-powered smart waste segregation system to promote cleanliness and environmental awareness. The system uses a camera to capture images of waste items thrown into a dustbin. A Computer Vision model analyses the images and classifies the waste into categories such as plastic, paper, and organic waste.

The system was trained using thousands of images of different waste items. During testing, students placed various objects in front of the camera, including plastic bottles, newspapers, banana peels, and cardboard boxes.

The AI system successfully identified most objects. However, it sometimes classified a brown cardboard box as organic waste because the two objects had similar colours and appearances.

The school wants to improve the model by providing more diverse training images and ensuring that the objects are captured under different lighting conditions.

Questions

Q1. What is Computer Vision?
a) A technology used to create computer programs only
b) A field of AI that enables computers to interpret images and videos
c) A technology used only for storing data
d) A method of connecting computers to the internet

Q2. Which device is used to capture images of waste items?
a) Speaker
b) Keyboard
c) Camera
d) Printer

Q3. Which of the following is an example of Computer Vision in the case study?
a) Typing a report about waste management
b) Classifying waste items using images
c) Playing music in the classroom
d) Sending an email to the principal

Q4. Why did the AI model sometimes classify the cardboard box incorrectly?
a) The camera was used to capture images.
b) Cardboard boxes cannot be photographed.
c) The cardboard box and organic waste had similar visual features.
d) Computer Vision cannot identify any objects.

Q5. Which of the following would help improve the accuracy of the Computer Vision model?
a) Training the model with fewer images
b) Using diverse images under different lighting conditions
c) Removing all training images
d) Turning off the camera

Q6. Identify the input and output of the smart waste segregation system.

Q7. State any two real-life applications of Computer Vision other than waste segregation.

Q8. Why is a large and diverse dataset important when training a Computer Vision model?

Q9. What might happen if the model is trained only with images captured in bright light?

Q10. Explain how Computer Vision helps the school protect the environment.