SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE	DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech	**Assignment Type: Lab**	**AcademicYear:**2025-2026

Course Coordinator Name	Venkataramana Veeramsetty	
Instructor(s)Name	1. Dr. Mohammed Ali Shaik 2. Dr. T Sampath Kumar 3. Mr. S Naresh Kumar 4. Dr. V. Rajesh 5. Dr. Brij Kishore 6. Dr Pramoda Patro 7. Dr. Venkataramana 8. Dr. Ravi Chander 9. Dr. Jagjeeth Singh	
Course Code	24CS002PC215	**Course Title** AI Assisted Coding
Year/Sem	II/I	**Regulation** R24
Date and Day of Assignment	06-08-2025	**Time(s)**
Duration	2 Hours	**Applicable to Batches**

AssignmentNumber:4.5(Present assignment number)**/24**(Total number of assignments)

Q. No.	Question	Expected Time to complete
1	**Lab 4: Advanced Prompt Engineering: Zero-shot, one-shot, and few-shot techniques** **Objective:** To explore and compare Zero-shot, One-shot, and Few-shot prompting techniques for classifying emails into predefined categories using a large language model (LLM). Suppose that you work for a company that receives hundreds of customer emails daily. Management wants to automatically classify emails into categories like "Billing", "Technical Support", "Feedback", and "Others" before assigning them to appropriate departments. Instead of training a new model, your task is to use prompt engineering techniques with an existing LLM to handle the classification.	08.08.2025 EOD

Tasks to be completed are as below

1. **Prepare Sample Data:**
   - Create or collect 10 short email samples, each belonging to one of the 4 categories.

PROMPT: give a code Create or collect 10 short email samples, each belonging to one of the 4 categories

```python
email_categories = [
    "Professional Communication",
    "Casual Personal Correspondence",
    "Notifications and Alerts",
    "Marketing and Promotional"
]

print("Defined Email Categories:")
for i, category in enumerate(email_categories):
    print(f"{i+1}. {category}")
```

```
Defined Email Categories:
1. Professional Communication
2. Casual Personal Correspondence
3. Notifications and Alerts
4. Marketing and Promotional
```

```python
email_samples = []

# Professional Communication
email_samples.append({'category': 'Professional Communication', 'text': 'Dear Team, Please find the quarterly report attached.'})
email_samples.append({'category': 'Professional Communication', 'text': 'Subject: Meeting Agenda for Tomorrow. Here is the agenda for our meeting tomorrow at 10 AM.'})

# Casual Personal Correspondence
email_samples.append({'category': 'Casual Personal Correspondence', 'text': 'Hey, just checking in! How have you been?'})
email_samples.append({'category': 'Casual Personal Correspondence', 'text': 'Hi [Name], Want to grab coffee sometime next week?'})
email_samples.append({'category': 'Casual Personal Correspondence', 'text': 'Subject: Fun Weekend! Had a great time this weekend, thanks for everything!'})

# Notifications and Alerts
email_samples.append({'category': 'Notifications and Alerts', 'text': 'Your account balance is low. Please add funds to avoid service interruption.'})
email_samples.append({'category': 'Notifications and Alerts', 'text': 'Subject: Password Reset Confirmation. Your password has been successfully reset.'})
email_samples.append({'category': 'Notifications and Alerts', 'text': 'Your order has shipped. Track your package here: [tracking link]'})

# Marketing and Promotional
email_samples.append({'category': 'Marketing and Promotional', 'text': 'Limited time offer: Get 20% off your next purchase!'})
email_samples.append({'category': 'Marketing and Promotional', 'text': 'Subject: Don\'t miss out on our summer sale!'})

print(f"Generated {len(email_samples)} email samples.")
for i, sample in enumerate(email_samples):
    print(f"Sample {i+1}: Category: {sample['category']}, Text: {sample['text']}")
```

```
Generated 10 email samples.
Sample 1: Category: Professional Communication, Text: Dear Team, Please find the quarterly report attached.
Sample 2: Category: Professional Communication, Text: Subject: Meeting Agenda for Tomorrow. Here is the agenda for our meeting tomorrow at 10 AM.
Sample 3: Category: Casual Personal Correspondence, Text: Hey, just checking in! How have you been?
Sample 4: Category: Casual Personal Correspondence, Text: Hi [Name], Want to grab coffee sometime next week?
Sample 5: Category: Casual Personal Correspondence, Text: Subject: Fun Weekend! Had a great time this weekend, thanks for everything!
Sample 6: Category: Notifications and Alerts, Text: Your account balance is low. Please add funds to avoid service interruption.
Sample 7: Category: Notifications and Alerts, Text: Subject: Password Reset Confirmation. Your password has been successfully reset.
Sample 8: Category: Notifications and Alerts, Text: Your order has shipped. Track your package here: [tracking link]
Sample 9: Category: Marketing and Promotional, Text: Limited time offer: Get 20% off your next purchase!
Sample 10: Category: Marketing and Promotional, Text: Subject: Don't miss out on our summer sale!
```

```
for sample in email_samples:
    print(f"Category: {sample['category']}")
    print(f"Text: {sample['text']}")
    print("-" * 30)  # Separator for readability
```

```
Category: Professional Communication
Text: Dear Team, Please find the quarterly report attached.
------------------------------
Category: Professional Communication
Text: Subject: Meeting Agenda for Tomorrow. Here is the agenda for our meeting tomorrow at 10 AM.
------------------------------
Category: Casual Personal Correspondence
Text: Hey, just checking in! How have you been?
------------------------------
Category: Casual Personal Correspondence
Text: Hi [Name], Want to grab coffee sometime next week?
------------------------------
Category: Casual Personal Correspondence
Text: Subject: Fun Weekend! Had a great time this weekend, thanks for everything!
------------------------------
Category: Notifications and Alerts
Text: Your account balance is low. Please add funds to avoid service interruption.
------------------------------
Category: Notifications and Alerts
Text: Subject: Password Reset Confirmation. Your password has been successfully reset.
------------------------------
Category: Notifications and Alerts
Text: Your order has shipped. Track your package here: [tracking link]
------------------------------
Category: Marketing and Promotional
Text: Limited time offer: Get 20% off your next purchase!
------------------------------
Category: Marketing and Promotional
Text: Subject: Don't miss out on our summer sale!
------------------------------
```

2. **Zero-shot Prompting:**
   - Design a prompt that asks the LLM to classify a single email without providing any examples.
   - Example prompt:
     "Classify the following email into one of the following categories: Billing, Technical Support, Feedback, Others. Email: 'I have not received my invoice for last month.'"

Prompt: Generate a code which takes emails from the user as an input and let the code give output from which category(feedback, billing, technical support and others) the email belongs to..

```python
email_list = []
print("\nEnter email samples one by one. Type 'done' on a new line to finish.")

while True:
    line = input()
    if line.lower() == 'done':
        break
    email_list.append(line)

print(f"\nReceived {len(email_list)} email samples.")

# Step 3 & 4: Categorize and display results for each email
def categorize_email(email_text):
    email_text_lower = email_text.lower()

    if any(keyword in email_text_lower for keyword in ["bill", "invoice", "payment", "charge", "subscription"]):
        return "Billing"
    elif any(keyword in email_text_lower for keyword in ["support", "technical", "error", "bug", "trouble", "fix"]):
        return "Technical Support"
    elif any(keyword in email_text_lower for keyword in ["feedback", "suggestion", "comment", "improve", "review"]):
        return "Feedback"
    else:
        return "Others"

print("\nCategorization Results:")
for i, email in enumerate(email_list):
    predicted_category = categorize_email(email)
    print(f"Email {i+1}:")
    print(f"  Text: {email}")
    print(f"  Category: {predicted_category}")
    print("-" * 30)  # Separator
```

```
Enter email samples one by one. Type 'done' on a new line to finish.
The app keeps crashing whenever I try to upload a file. Please fix this ASAP
done

Received 1 email samples.

Categorization Results:
Email 1:
  Text: The app keeps crashing whenever I try to upload a file. Please fix this ASAP
  Category: Technical Support
------------------------------
```

What can I help you build?

3. One-shot Prompting:

- Add one labeled example before asking the model to classify a new mail

```
email_list = []
print("\nEnter email samples one by one. Type 'done' on a new line to finish.")

while True:
    line = input()
    if line.lower() == 'done':
        break
    email_list.append(line)

print(f"\nReceived {len(email_list)} email samples.")

# Step 3 & 4: Categorize and display results for each email
def categorize_email(email_text):
    email_text_lower = email_text.lower()

    if any(keyword in email_text_lower for keyword in ["bill", "invoice", "payment", "charge", "subscription"]):
        return "Billing"
    elif any(keyword in email_text_lower for keyword in ["support", "technical", "error", "bug", "trouble", "fix"]):
        return "Technical Support"
    elif any(keyword in email_text_lower for keyword in ["feedback", "suggestion", "comment", "improve", "review"]):
        return "Feedback"
    else:
        return "Others"

print("\nCategorization Results:")
for i, email in enumerate(email_list):
    predicted_category = categorize_email(email)
    print(f"Email {i+1}:")
    print(f"  Text: {email}")
    print(f"  Category: {predicted_category}")
    print("-" * 30)  # Separator
```

```
Enter email samples one by one. Type 'done' on a new line to finish.
I was charged twice for the same month. Can you please look into this?
done

Received 1 email samples.

Categorization Results:
Email 1:
  Text: I was charged twice for the same month. Can you please look into this?
  Category: Billing
------------------------------
```

What can I help you build?

4. **Few-shot Prompting:**

- Use 3–5 labeled examples in your prompt before asking the model to classify a new email.

```
Enter email samples one by one. Type 'done' on a new line to finish.
Is there a student discount available for premium plans?
Do you offer annual billing with a discount?
I'm getting a 404 error when trying to access the billing page.
My trial just ended, but I wasn't notified before the payment was taken.
Love the experience so far! The UI is clean and intuitive.
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Is there a student discount available for premium plans?
  Category: Others
------------------------------
Email 2:
  Text: Do you offer annual billing with a discount?
  Category: Billing
------------------------------
Email 3:
  Text: I'm getting a 404 error when trying to access the billing page.
  Category: Billing
------------------------------
Email 4:
  Text: My trial just ended, but I wasn't notified before the payment was taken.
  Category: Billing
------------------------------
Email 5:
  Text: Love the experience so far! The UI is clean and intuitive.
  Category: Others
------------------------------
```

5. **Evaluation:**

- Run all three techniques on the same set of 5 test emails.
- Compare and document the accuracy and clarity of responses.

5 TEST EMAILS ON BILLING:

```
Enter email samples one by one. Type 'done' on a new line to finish.
I was charged twice this month. Please check and refund
Subject: Request for Invoice "Hello, can you please send me an invoice for the payment I made last week? I need it for accounting purposes. Thanks!"
Subject: Double Charge on My Account "Hi, I noticed that I was charged twice this month for my subscription. Could you please check and issue a refund for the duplicate charge?"
"Is there a discount for switching to annual billing?"
"How do I update my credit card info?"
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: I was charged twice this month. Please check and refund
  Category: Billing
----------------------------
Email 2:
  Text: Subject: Request for Invoice "Hello, can you please send me an invoice for the payment I made last week? I need it for accounting purposes. Thanks!"
  Category: Billing
----------------------------
Email 3:
  Text: Subject: Double Charge on My Account "Hi, I noticed that I was charged twice this month for my subscription. Could you please check and issue a refund for the duplicate charge?"
  Category: Billing
----------------------------
Email 4:
  Text: "Is there a discount for switching to annual billing?"
  Category: Billing
----------------------------
Email 5:
  Text: Subject: Incorrect Charge on My Account Body: Hi, I was charged twice for the same course this month. Please assist with the refund.
  Category: Billing
----------------------------
```

5 TEST EMAILS ON FEEDBACK:

```
Enter email samples one by one. Type 'done' on a new line to finish.
Subject: Love the New Interface! Body: Hey, I really like the updated design of the dashboard. It's much more user-friendly.
Subject: Course Could Use More Examples Body: Hi, I think the JavaScript course could be improved by adding more real-world examples.
Subject: App Feedback Body: Hi there, the mobile app is generally great, but it crashes occasionally. Just wanted to share.
Subject: Suggestion for Quiz Format Body: I'd recommend allowing partial credit for multiple-choice questions. It would be more fair.
Subject: Course Rating Body: Just finished the Machine Learning course — excellent content and delivery. 5 stars!
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Love the New Interface! Body: Hey, I really like the updated design of the dashboard. It's much more user-friendly.
  Category: Others
----------------------------
Email 2:
  Text: Subject: Course Could Use More Examples Body: Hi, I think the JavaScript course could be improved by adding more real-world examples.
  Category: Feedback
----------------------------
Email 3:
  Text: Subject: App Feedback Body: Hi there, the mobile app is generally great, but it crashes occasionally. Just wanted to share.
  Category: Feedback
----------------------------
Email 4:
  Text: Subject: Suggestion for Quiz Format Body: I'd recommend allowing partial credit for multiple-choice questions. It would be more fair.
  Category: Feedback
----------------------------
Email 5:
  Text: Subject: Course Rating Body: Just finished the Machine Learning course — excellent content and delivery. 5 stars!
  Category: Others
```

5 TEST EMAILS ON TECHNICAL SUPPORT:

```
Enter email samples one by one. Type 'done' on a new line to finish.
Subject: Error when submitting assignment Body: Hello, I get an error when I try to submit my assignment. It says "Error 500." Please help.
Subject: Lost my quiz answers Body: Hi, I was doing a quiz and the system logged me out. When I logged back in, my answers were gone. Can you fix this?
Subject: Unable to log in to my account Body: Hi, I've been trying to log into my LMS account for the past hour, but it keeps showing an error message saying "User not found." I'm sure I'm using the corre
Subject: Password reset link not working Body: Dear team, I requested a password reset email, but when I click the link in the email, it says the link is invalid or expired. Can you assist me with resetti
"My video player is stuck and won't load any courses."
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Error when submitting assignment Body: Hello, I get an error when I try to submit my assignment. It says "Error 500." Please help.
  Category: Technical Support
----------------------------
Email 2:
  Text: Subject: Lost my quiz answers Body: Hi, I was doing a quiz and the system logged me out. When I logged back in, my answers were gone. Can you fix this?
  Category: Technical Support
----------------------------
Email 3:
  Text: Subject: Unable to log in to my account Body: Hi, I've been trying to log into my LMS account for the past hour, but it keeps showing an error message saying "User not found." I'm sure I'm using tl
  Category: Technical Support
----------------------------
Email 4:
  Text: Subject: Password reset link not working Body: Dear team, I requested a password reset email, but when I click the link in the email, it says the link is invalid or expired. Can you assist me with
  Category: Others
----------------------------
Email 5:
  Text: "My video player is stuck and won't load any courses."
  Category: Others
----------------------------
```

5 TEST EMAILS ON OTHERS:

```
Enter email samples one by one. Type 'done' on a new line to finish.
Subject: Do you have group discounts? Body: Hi, Do you offer discounts for groups or teams?
Subject: Are you hiring? Body: Hello, I want to know if you are hiring for any jobs like course creators or designers.
Subject: Can I connect LMS with our system? Body: Hi, Can your LMS work with our company's HR system?
Subject: How to become an instructor? Body: Hello, I want to teach courses on your platform. How can I apply?
Subject: Do you have mobile apps? Body: Hi, Do you have apps for Android and iPhone?
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Do you have group discounts? Body: Hi, Do you offer discounts for groups or teams?
  Category: Others
----------------------------
Email 2:
  Text: Subject: Are you hiring? Body: Hello, I want to know if you are hiring for any jobs like course creators or designers.
  Category: Others
----------------------------
Email 3:
  Text: Subject: Can I connect LMS with our system? Body: Hi, Can your LMS work with our company's HR system?
  Category: Others
----------------------------
Email 4:
  Text: Subject: How to become an instructor? Body: Hello, I want to teach courses on your platform. How can I apply?
  Category: Others
----------------------------
Email 5:
  Text: Subject: Do you have mobile apps? Body: Hi, Do you have apps for Android and iPhone?
  Category: Others
----------------------------
```

Requirements:
- VS Code with Github Copilot or Cursor IDE and/or Google Colab with Gemini

Deliverables:

- A .txt or .md file showing prompts and model responses.
- A comparison table showing classification accuracy for each technique.
- A short reflection on which method was most effective and why
  .