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)

NAME:B.ARUNKUMAR **Roll_no:**2403A10A0   **Batch**:04

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

```
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
```

```
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 USER INPUT AND CODE SHOULD GIVE OUTPUT AS 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 email.

```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.")

def categorize_email(email_text, categories):
    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, new_email_categories)
    print(f"Email {i+1}:")
    print(f"  Text: {email}")
    print(f"  Category: {predicted_category}")
    print("-" * 30)
```

```
Enter email samples one by one. Type 'done' on a new line to finish.
Subject: Feedback on the New Interface Design Hi Team, I wanted to share my thoughts on the new interface design. Overall, it's very user-friendly, but I think the color contrast could be improved for better readability. Thanks!
done

Received 1 email samples.

Categorization Results:
Email 1:
   Text: Subject: Feedback on the New Interface Design Hi Team, I wanted to share my thoughts on the new interface design. Overall, it's very user-friendly, but I think the color contrast could be improved for better readability. Thanks!
   Category: Feedback
...........................
```

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.
Subject: Request for Internship Body: Hi, I'm a computer science student and would love to intern with your company. Are there any open positions? Regards, Daniel
Subject: Error While Submitting Assignment Body: Dear Support, I'm getting a "Submission failed" error when trying to upload my assignment. Kindly assist. Best, Carlos
Subject: Suggestion for UI Improvement Body: Hi Team, I think the dashboard could be more user-friendly if you reorganize the navigation menu. Just a suggestion. Thanks, Emma
Subject: Payment Not Going Through Body: Dear Team, I've been trying to pay for my subscription, but the payment keeps failing. Can you assist? Best, Anika
done

Received 4 email samples.

Categorization Results:
Email 1:
  Text: Subject: Request for Internship Body: Hi, I'm a computer science student and would love to intern with your company. Are there any open positions? Regards, Daniel
  Category: Others
-----------------------------
Email 2:
  Text: Subject: Error While Submitting Assignment Body: Dear Support, I'm getting a "Submission failed" error when trying to upload my assignment. Kindly assist. Best, Carlos
  Category: Technical Support
-----------------------------
Email 3:
  Text: Subject: Suggestion for UI Improvement Body: Hi Team, I think the dashboard could be more user-friendly if you reorganize the navigation menu. Just a suggestion. Thanks, Emma
  Category: Feedback
-----------------------------
Email 4:
  Text: Subject: Payment Not Going Through Body: Dear Team, I've been trying to pay for my subscription, but the payment keeps failing. Can you assist? Best, Anika
  Category: Billing
-----------------------------
```

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.
Subject: Overbilling Concern Body: I noticed a higher charge than usual on my bill this month. Could you explain the difference?
Subject: Payment Failed Body: Hi, I tried paying for a new course but the transaction keeps failing. Can you check?
Subject: Subscription Cancellation Body: Dear team, I want to cancel my subscription effective immediately. Please confirm.
Subject: Need Invoice Copy Body: Hello, I need a copy of the invoice for my last payment for reimbursement purposes.
Subject: Incorrect Charge on My Account Body: Hi, I was charged twice for the same course this month. Please assist with the refund.
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Overbilling Concern Body: I noticed a higher charge than usual on my bill this month. Could you explain the difference?
  Category: Billing
-----------------------------
Email 2:
  Text: Subject: Payment Failed Body: Hi, I tried paying for a new course but the transaction keeps failing. Can you check?
  Category: Billing
-----------------------------
Email 3:
  Text: Subject: Subscription Cancellation Body: Dear team, I want to cancel my subscription effective immediately. Please confirm.
  Category: Billing
-----------------------------
Email 4:
  Text: Subject: Need Invoice Copy Body: Hello, I need a copy of the invoice for my last payment for reimbursement purposes.
  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 Submitting Assignment Body: Hello, I'm getting an error every time I try to submit my assignment. Please help.
Subject: Can't Access My Dashboard Body: Hi, I keep getting a "404 Not Found" error when I log in. Can you fix this?
Subject: Video Not Loading Body: Hi Support, the video for Lesson 3 won't play. It's just showing a black screen
Subject: Mobile App Not Syncing Body: Hey, the progress on the mobile app isn't syncing with my web account. Please investigate.
Subject: System Slow Body: Hello, the LMS is extremely slow today. Is there any maintenance going on?
done

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Error Submitting Assignment Body: Hello, I'm getting an error every time I try to submit my assignment. Please help.
  Category: Technical Support
-----------------------------
Email 2:
  Text: Subject: Can't Access My Dashboard Body: Hi, I keep getting a "404 Not Found" error when I log in. Can you fix this?
  Category: Technical Support
-----------------------------
Email 3:
  Text: Subject: Video Not Loading Body: Hi Support, the video for Lesson 3 won't play. It's just showing a black screen
  Category: Technical Support
-----------------------------
Email 4:
  Text: Subject: Mobile App Not Syncing Body: Hey, the progress on the mobile app isn't syncing with my web account. Please investigate.
  Category: Others
-----------------------------
Email 5:
  Text: Subject: System Slow Body: Hello, the LMS is extremely slow today. Is there any maintenance going on?
  Category: Others
-----------------------------
```

5 TEST EMAILS ON OTHERS:

```
Enter email samples one by one. Type 'done' on a new line to finish.
Subject: Partnership Opportunity Body: Hi, I'm interested in partnering with your platform to offer a new training course.
Subject: Request for Certificate Reissue Body: Hello, I lost access to my certificate and would like it reissued. What's the process?
ubject: Career Advice Body: Hi there, I've completed several courses. Could you suggest a learning path to get into AI?
Subject: General Inquiry Body: I'm exploring online platforms and wanted to know more about your course structure.
Subject: Internship Request Body: Hi, I'm a final-year student looking for internship opportunities. Do you have any openings?
DONE

Received 5 email samples.

Categorization Results:
Email 1:
  Text: Subject: Partnership Opportunity Body: Hi, I'm interested in partnering with your platform to offer a new training course.
  Category: Others
-----------------------------
Email 2:
  Text: Subject: Request for Certificate Reissue Body: Hello, I lost access to my certificate and would like it reissued. What's the process?
  Category: Others
-----------------------------
Email 3:
  Text: ubject: Career Advice Body: Hi there, I've completed several courses. Could you suggest a learning path to get into AI?
  Category: Others
-----------------------------
Email 4:
  Text: Subject: General Inquiry Body: I'm exploring online platforms and wanted to know more about your course structure.
  Category: Others
-----------------------------
Email 5:
  Text: Subject: Internship Request Body: Hi, I'm a final-year student looking for internship opportunities. Do you have any openings?
  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
  .