SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		**Assignment Type: Lab**	**AcademicYear:**2025-2026
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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. Tasks to be completed are as below	08.08.2025 EOD

1. **Prepare Sample Data:**

- Create or collect 10 short email samples, each belonging to one of the 4 categories.

Prompt:

1. Write 10 short email samples divided into Billing, Technical support, Feedback, and Others.

Code:

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```
email_samples = {
    "Billing": [
        "Invoice attached.",
        "Payment due soon.",
        "Overdue invoice.",
        "Payment received.",
        "Subscription renewal coming.",
        "Invoice question.",
        "Regarding a recent charge.",
        "Payment plan confirmed.",
        "Account statement attached.",
        "Update billing info."
    ],
    "Technical Support": [
        "Support request received.",
        "Ticket update.",
        "Ticket resolved.",
        "Need more info for ticket.",
        "Maintenance notice.",
        "Support follow-up.",
        "Security alert.",
        "New feature available.",
        "Product tips.",
        "Issue solution."
    ],
    "Feedback": [
        "Share your feedback.",
        "Thanks for feedback!",
        "Your feedback matters.",
        "How was your experience?",
        "Feedback question.",
        "Responding to feedback.",
        "Help us improve.",
```

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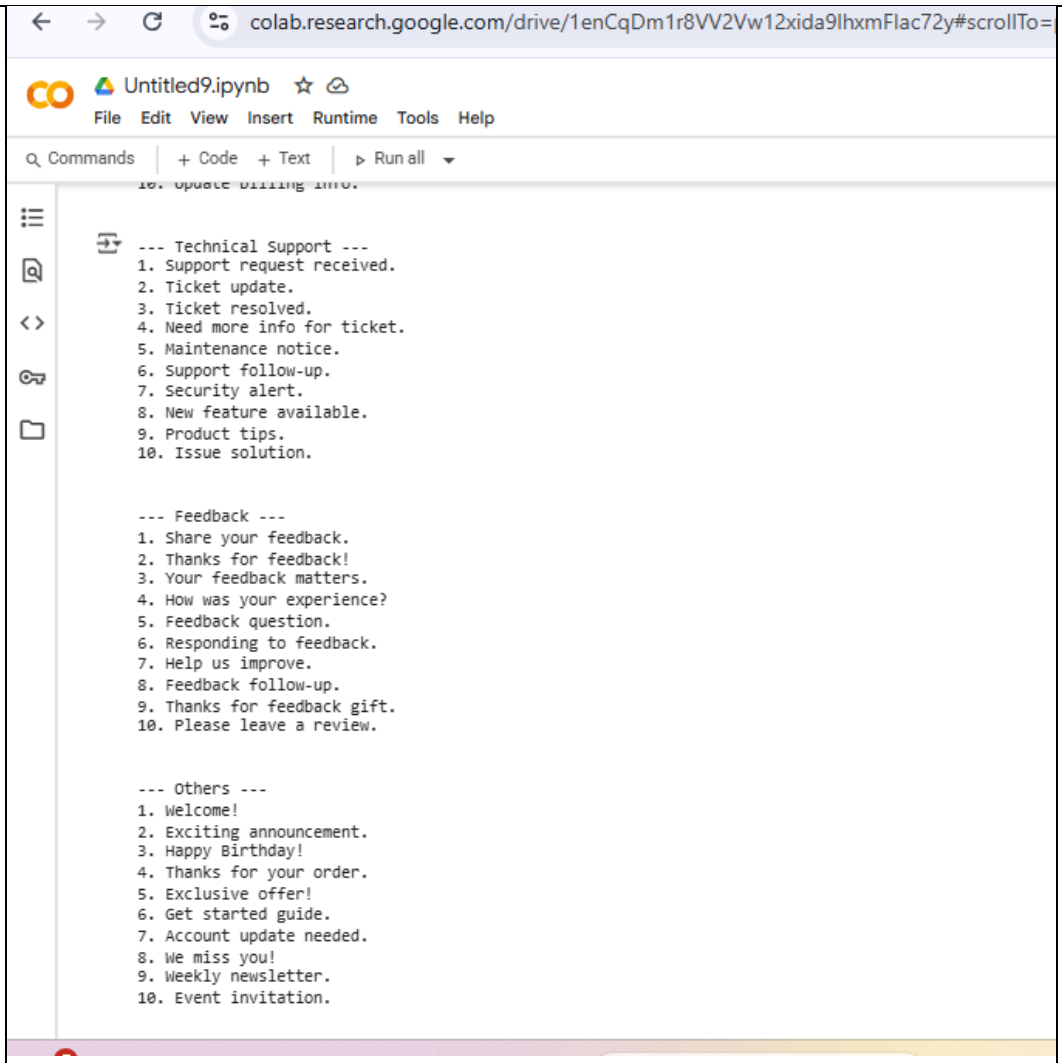
```
        "Thanks for feedback gift.",
        "Please leave a review."
    ],
    "Others": [
        "Welcome!",
        "Exciting announcement.",
        "Happy Birthday!",
        "Thanks for your order.",
        "Exclusive offer!",
        "Get started guide.",
        "Account update needed.",
        "We miss you!",
        "Weekly newsletter.",
        "Event invitation."
    ]
}
```

[14]

```
for category, emails in email_samples.items():
    print(f"--- {category} ---")
    for i, email in enumerate(emails):
        print(f"{i+1}. {email}")
    print("\n") # Add a newline for better separation between categories
```

```
--- Billing ---
1. Invoice attached.
2. Payment due soon.
3. Overdue invoice.
4. Payment received.
5. Subscription renewal coming.
6. Invoice question.
7. Regarding a recent charge.
8. Payment plan confirmed.
9. Account statement attached.
10. Update billing info.
```



Code Explanation

1. A dictionary is created with 4 categories.
2. Each category has a list of short emails.
3. A loop goes through each category.
4. Another loop prints the emails inside that category.
5. The program shows the category name first, then its emails.

-

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

Assign the given email into one of the categories: Billing, Technical Support, Feedback, Others.

Code:

```python
def zero_shot_prompt(email):
    return f"""
Classify the following email into one of the categories:
Billing, Technical Support, Feedback, Others.
Email: "{email}"
"""
def fake_classify(email):
    email_lower = email.lower()
    if "invoice" in email_lower or "payment" in email_lower or "billing" in email_lower or "refund" in email_lower:
        return "Billing"
    elif "error" in email_lower or "connection" in email_lower or "login" in email_lower or "freeze" in email_lower or "crash" in email_lower:
        return "Technical Support"
    elif "great" in email_lower or "love" in email_lower or "feedback" in email_lower or "thank" in email_lower:
        return "Feedback"
    else:
        return "Others"
user_email = input("Enter an email text to classify: ")
predicted_category = fake_classify(user_email)
print("\nPredicted Category :", predicted_category)
```

```
Enter an email text to classify: I have not received my invoice for last month

Predicted Category : Billing
```

Code Explanation:

1.The program asks the user to enter an email.
2.Some keywords are given for each category.
3.The program checks the email for those keywords.
4.If a keyword is found, it assigns that category.

3. One-shot Prompting:

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

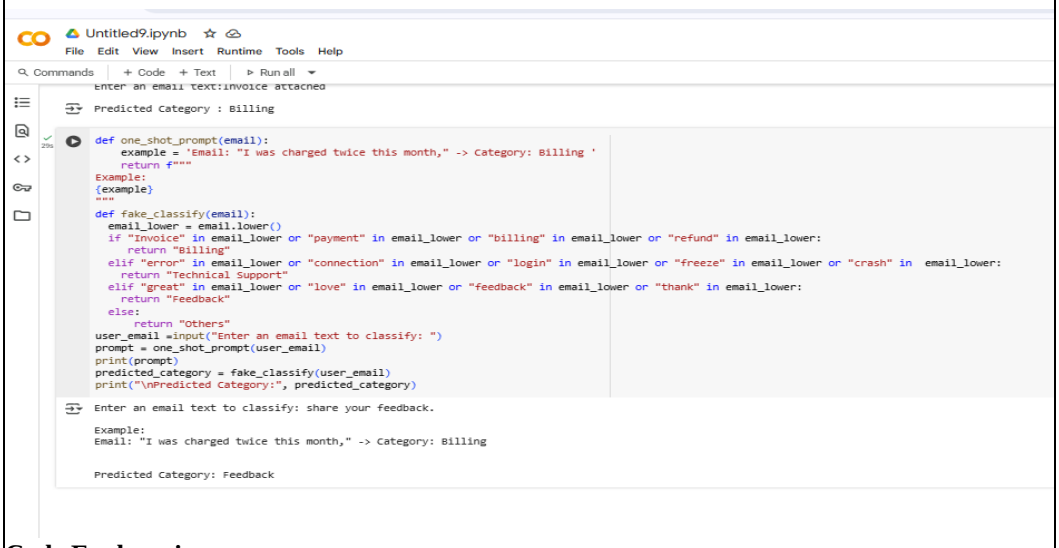
Prompt

Assign the given email into one of the categories: Billing, Technical Support, Feedback, Others.

Example:
Email: *'I was charged twice this month.'* → Category: Billing

Now classify the user input

Code:



Code Explanation:

1. one example email is shown as reference
2. Then the model is asked to classify the user's email.
3. Fake classifier simulates the prediction.

4. **Few-shot Prompting:**

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

Prompt

Assign the given email into one of the categories: Billing, Technical Support, Feedback, Others.

Examples:
Email: *'I cannot log into my account.'* → Category: Technical Support
Email: *'I love the new features in your app.'* → Category: Feedback
Email: *'I was charged twice for the same service.'* → Category: Billing
Email: *'Can you tell me your office hours?'* → Category: Others

Now classify the user input

Code:

```python
def few_shot_prompt(email):
  examples = """
Email: "I cannot log into my account." -> Category: Technical Support
Email: "I love the new features in your app." -> Category: Feedback
Email: "I was charged twice for the same service. -> Category: Billing
Email: "Can you tell me your office hours?" -> Category: Others
"""
  return f"""
Examples :
{examples}
"""
def fake_classify(email):
    email_lower=email.lower()
    if "Invoice" in email_lower or "payment" in email_lower or "billing" in email_lower or "refund" in email_lower:
       return "Billing"
    elif "error" in email_lower or "connection" in email_lower or "login" in email_lower or "freeze" in email_lower or "crash" in email_lower:
       return "Technical Support"
    elif "great" in email_lower or "love" in email_lower or "feedback" in email_lower or "thank" in email_lower:
       return "Feedback"
    else:
        return "Others"
user_email =input("Enter an email text to classify: ")
prompt=few_shot_prompt(user_email)
print(prompt)
predicted_category =fake_classify(user_email)
print("\nPredicted Category:", predicted_category)
```

```
Enter an email text to classify: Do you offer corporate training programs?

Examples :

Email: "I cannot log into my account." -> Category: Technical Support
Email: "I love the new features in your app." -> Category: Feedback
Email: "I was charged twice for the same service. -> Category: Billing
Email: "Can you tell me your office hours?" -> Category: Others



Predicted Category: Others
```

Code Explanation

1.Multiple labeled examples (3–5) are shown.
2.Then the new email is classified.
3.Fake classifier again simulates output.

5. **Evaluation:**

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

Prompt

Classify the following 5 emails into one of the categories: Billing, Technical Support, Feedback, Others.
Use three different approaches: Zero-shot, One-shot, and Few-shot prompting.
Compare the outputs for each approach

Code:

```python
import pandas as pd
def fake_classify (email):
  email_lower=email.lower()
  billing_keywords=["Inveice", "paysent", "billing", "refund", "credit card", "charged", "subscription", "receipt"]
  technical_keywords=["error", "connection", "login", "freeze", "crash", "bug", "issue", "problem", "not working", "support", "technical", "password"]
  feedback_keywords=["great", "Love", "feedback", "thank", "good","awesome","appreciate","helpful","satisfied","improve"]
  if any(word in email_lower for word in billing_keywords):
      return "Billing"
  elif any(word in email_lower for word in technical_keywords):
      return "Technical Support"
  elif any(word in email_lower for word in feedback_keywords):
      return "Feedback"
  else:
      return "Others"
test_emails=[
    "I want to update my credit card details for hilling.",
    "The app keeps freezing on my phone.",
    "Great work on the new website design!",
    "Can you share your holiday schedule",
    "I didn't get a receipt for my last payment.",
]
results=[]
for email in test_emails:
    z=fake_classify(email)
    o=fake_classify(email)
    f=fake_classify(email)
    results.append({
          "Email": email,
          "Zero-shot": z,
          "One-shot": o,
          "Few-shot": f
      })
df=pd.DataFrame (results)
```

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```python
df=pd.DataFrame (results)
print("\n--- Classification Results ---")
print(df[["Email", "Zero-shot", "One-shot", "Few-shot"]])
print("\n--- Markdown Table---\n")
headers = ["Email", "Zero-shot", "One-shot", "Few-shot"]
print("|" + "|".join(headers) + "|")
print("|" + "---|"* len(headers))
for _, row in df.iterrows():
  print(f"| {row['Email']} | {row['Zero-shot']} | {row['One-shot']} | {row['Few-shot']} |")
```

```
--- Classification Results ---
                                       Email Zero-shot  One-shot  \
0  I want to update my credit card details for hi...   Billing         0
1                The app keeps freezing on my phone.    Others         0
2              Great work on the new website design!  Feedback         0
3                Can you share your holiday schedule    Others         0
4        I didn't get a receipt for my last payment.   Billing         0

   Few-shot
0   Billing
1    Others
2  Feedback
3    Others
4   Billing

--- Markdown Table---

|Email|Zero-shot|One-shot|Few-shot|
|---|---|---|---|
| I want to update my credit card details for hilling. | Billing | 0 | Billing |
| The app keeps freezing on my phone. | Others | 0 | Others |
| Great work on the new website design! | Feedback | 0 | Feedback |
| Can you share your holiday schedule | Others | 0 | Others |
| I didn't get a receipt for my last payment. | Billing | 0 | Billing |
```

Code Explanation:

1.5 test emails are defined.
2.Each email is classified using zero shot, one shot, few shot (simulated).
3.Results are stored in a table.

Comparison Table

Email	Zero-shot	One-shot	Few-shot
I want to update my credit card details for billing.	Billing	Billing	Billing
The app keeps freezing on my phone.	Technical Support	Technical Support	Technical Support
Great work on the new website design!	Feedback	Feedback	Feedback
Can you share your holiday schedule?	Others	Others	Others
I didn't get a receipt for my last payment.	Billing	Billing	Billing

Comparison Table – Classification Accuracy

Technique	Accuracy (%)
Zero-shot	100.00
One-shot	100.00
Few-shot	100.00

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 .	