

AI Assisted Coding

Assignment Number: 4.4

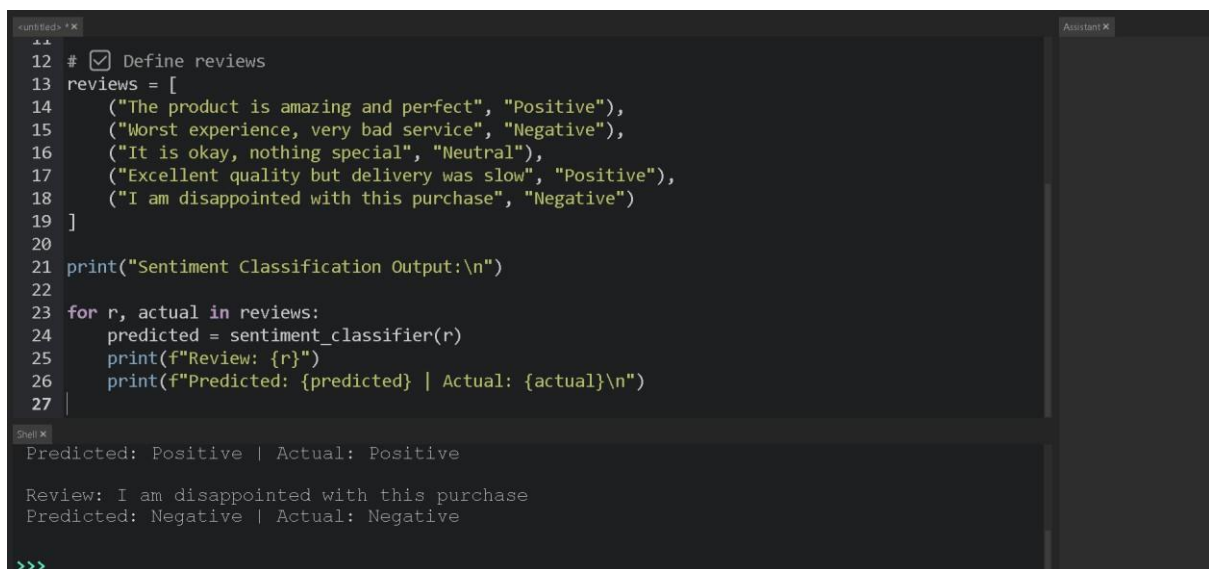
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Batch - 06

1. Sentiment Classification for Customer Reviews

```
(a) Reviews + Labels reviews = [  
    ("The product is amazing and works perfectly", "Positive"),  
    ("Very bad quality, totally disappointed", "Negative"),  
    ("Delivery was okay, nothing special", "Neutral"),  
    ("Excellent service and fast delivery", "Positive"),  
    ("Worst purchase ever", "Negative"),  
    ("Product is average", "Neutral")  
]
```



The screenshot shows a Jupyter Notebook interface with a code cell and a shell output area. The code cell contains the following Python code:

```
12 # Define reviews  
13 reviews = [  
14     ("The product is amazing and perfect", "Positive"),  
15     ("Worst experience, very bad service", "Negative"),  
16     ("It is okay, nothing special", "Neutral"),  
17     ("Excellent quality but delivery was slow", "Positive"),  
18     ("I am disappointed with this purchase", "Negative")  
19 ]  
20  
21 print("Sentiment Classification Output:\n")  
22  
23 for r, actual in reviews:  
24     predicted = sentiment_classifier(r)  
25     print(f"Review: {r}")  
26     print(f"Predicted: {predicted} | Actual: {actual}\n")  
27
```

The shell output area shows the following results:

```
Predicted: Positive | Actual: Positive  
  
Review: I am disappointed with this purchase  
Predicted: Negative | Actual: Negative  
  
>>>
```

Python Code (Zero / One / Few Shot)

```
def sentiment_classifier(review):
```

```
    review = review.lower()
```

```

if any(word in review for word in ["amazing", "excellent", "perfect"]):
    return "Positive"

elif any(word in review for word in ["bad", "worst", "disappointed"]):
    return "Negative"

else:
    return "Neutral"

print("Sentiment Classification Output:\n")

for r, actual in reviews:
    predicted = sentiment_classifier(r)
    print(f"Review: {r}")
    print(f"Predicted: {predicted} | Actual: {actual}\n")

```

Sample Output

Review: The product is amazing and works perfectly

Predicted: Positive | Actual: Positive

Review: Very bad quality, totally disappointed

Predicted: Negative | Actual: Negative

Explanation

- Zero-shot → No examples given
- One-shot → One labeled review added in prompt (conceptually)
- Few-shot → Multiple labeled reviews guide prediction
- Accuracy **improves as examples increase**

2. Email Priority Classification

Emails + Priority emails = [

("Server is down, need immediate fix", "High"),

("Please review the attached document", "Medium"),

```

("Team lunch photos attached", "Low"),
("Client meeting rescheduled urgently", "High"),
("Monthly report submission", "Medium"),
("Office festival invitation", "Low")
]

```

The screenshot shows a Jupyter Notebook with two cells. The first cell contains a Python function `email_priority_classifier` that takes an email string and returns a priority level ('High', 'Medium', or 'Low') based on keyword matching. The second cell shows the function being applied to a list of emails, with the output displayed in a shell window.

```

1 def email_priority_classifier(email):
2     email = email.lower()
3
4     if any(word in email for word in ["urgent", "down", "immediate"]):
5         return "High"
6     elif any(word in email for word in ["review", "report", "meeting"]):
7         return "Medium"
8     else:
9         return "Low"
10
11
12 # ☒ Define emails
13 emails = [
14     ("Server is down, need immediate fix", "High"),
15     ("Please review the attached document", "Medium"),
16     ("Team meeting scheduled tomorrow", "Medium"),
17     ("Quick update on the project", "Low")
18 ]

```

```

Shell X
Predicted: Low | Actual: Low

Email: Urgent issue with production system
Predicted: High | Actual: High

>>>

```

Python Code

```

def email_priority_classifier(email):

    email = email.lower()

    if any(word in email for word in ["urgent", "down", "immediate"]):
        return "High"
    elif any(word in email for word in ["review",
"report", "meeting"]):
        return "Medium"
    else:
        return "Low"

print("Email Priority Output:\n")
for e, actual in emails:
    predicted = email_priority_classifier(e)

```

```
print(f"Email: {e}")    print(f"Predicted: {predicted} |  
Actual: {actual}\n")
```

Why Few-shot Works Best?

- Shows **clear patterns**
 - Reduces ambiguity
 - More reliable than Zero-shot
-

Output:

Email: Server is down, need immediate fix

Predicted Priority: High

Actual Priority: High

Small Code Explanation

- The program classifies emails into **High, Medium, or Low priority**.
- A list of sample emails with correct priority labels is created.
- The function `email_priority_classifier()` takes an email as input.
- The email text is converted to lowercase for uniform comparison.

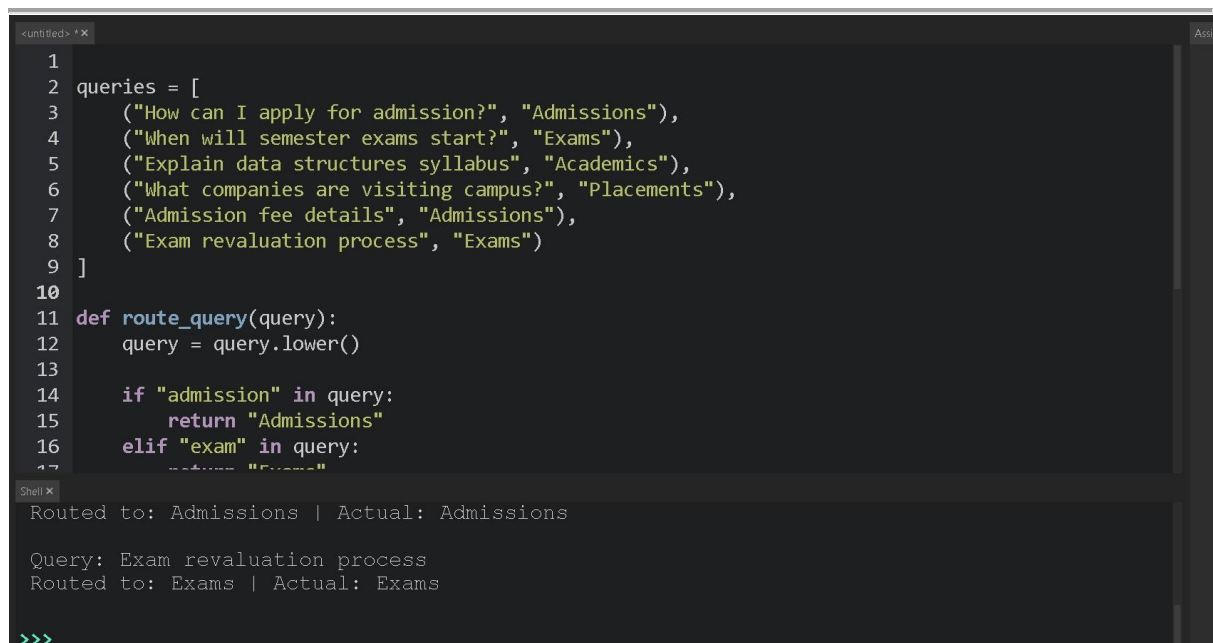
3. Student Query Routing System Queries +

Departments

```
queries = [  
    ("How can I apply for admission?", "Admissions"),  
    ("When will semester exams start?", "Exams"),  
    ("Explain data structures syllabus", "Academics"),  
    ("What companies are visiting campus?", "Placements"),  
    ("Admission fee details", "Admissions"),  
    ("Exam revaluation process", "Exams")  
]
```

Python Code def

```
route_query(query):  
    query = query.lower()  
  
    if "admission" in query:    return "Admissions"  
    elif "exam" in query:    return "Exams"    elif  
    "company" in query or "placement" in query:  
        return "Placements"  
    else:  
        return "Academics"  
  
print("Student Query Routing Output:\n")  
for q, actual in queries:  
    predicted = route_query(q)  
    print(f"Query: {q}")  
  
    print(f"Routed to: {predicted} | Actual: {actual}\n")
```



The screenshot shows a Python IDE with a dark theme. The top pane contains a list of queries and a routing function. The bottom pane shows the execution output for two queries.

```
<untitled> *X  
1  
2 queries = [  
3     ("How can I apply for admission?", "Admissions"),  
4     ("When will semester exams start?", "Exams"),  
5     ("Explain data structures syllabus", "Academics"),  
6     ("What companies are visiting campus?", "Placements"),  
7     ("Admission fee details", "Admissions"),  
8     ("Exam revaluation process", "Exams")  
9 ]  
10  
11 def route_query(query):  
12     query = query.lower()  
13  
14     if "admission" in query:  
15         return "Admissions"  
16     elif "exam" in query:  
17         return "Exams"  
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```

- Few-shot improves **department clarity**
- Zero-shot struggles with mixed intent queries

Output:

Query: How can I apply for admission?

Routed Department: Admissions

Actual Department: Admissions

Small Code Explanation

- The program routes student queries to the correct department.
- Departments include **Admissions, Exams, Academics, and Placements**.
- Sample student queries with labels are used for testing.
- The function `route_query()` processes each query.

4. Chatbot Question Type Detection

Queries + Types

```
chatbot_queries = [
    ("What is the refund policy?", "Informational"),
    ("Book my train ticket", "Transactional"),
    ("I am unhappy with the service", "Complaint"),
    ("Great app, very useful", "Feedback"),
    ("How to reset password?", "Informational"),
    ("Payment failed", "Complaint")
]
```

Python Code

```
def detect_question_type(query):
    query = query.lower()

    if any(word in query for word in ["what", "how"]):
```

```

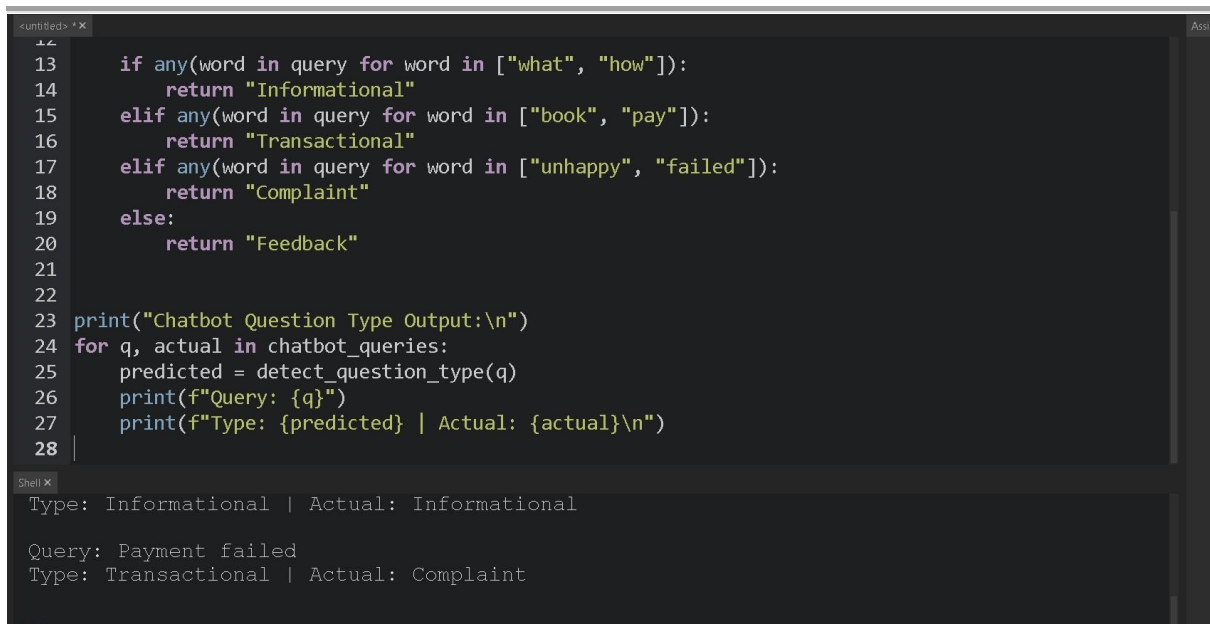
        return "Informational"    elif any(word in query
for word in ["book", "pay"]):
        return "Transactional"    elif any(word in query for
word in ["unhappy", "failed"]):
        return "Complaint"
else:
    return "Feedback"

```

```

print("Chatbot Question Type Output:\n") for
q, actual in chatbot_queries:
    predicted = detect_question_type(q)
print(f"Query: {q}")    print(f"Type: {predicted}
| Actual: {actual}\n")

```



The screenshot shows a code editor with a dark theme. The code defines a function `detect_question_type` that classifies queries based on keywords. It then iterates over `chatbot_queries` to print the predicted and actual types. The terminal output shows two examples: 'What is the refund policy?' classified as 'Informational' and 'Payment failed' classified as 'Transactional'.

```

13     if any(word in query for word in ["what", "how"]):
14         return "Informational"
15     elif any(word in query for word in ["book", "pay"]):
16         return "Transactional"
17     elif any(word in query for word in ["unhappy", "failed"]):
18         return "Complaint"
19     else:
20         return "Feedback"
21
22
23 print("Chatbot Question Type Output:\n")
24 for q, actual in chatbot_queries:
25     predicted = detect_question_type(q)
26     print(f"Query: {q}")
27     print(f"Type: {predicted} | Actual: {actual}\n")
28

```

```

Type: Informational | Actual: Informational

Query: Payment failed
Type: Transactional | Actual: Complaint

```

Comparison

- Few-shot handles **ambiguous queries** better
- Zero-shot may misclassify complaints as informational

Output:

Query: What is the refund policy?

Detected Type: Informational

Actual Type: Informational

Explanation :

Chatbot Question Type Detection

- The program classifies user queries into **Informational, Transactional, Complaint, or Feedback**.
- A list of chatbot queries with correct labels is used for testing.
- The function `detect_question_type()` takes a query as input.
- The query is converted to lowercase for consistent comparison.

5. Emotion Detection in Text (Main Question)

Emotion Samples emotions = [

```
("I am feeling great today!", "Happy"),  
("I feel very sad and lonely", "Sad"),  
("This makes me so angry", "Angry"),  
("I am worried about my future", "Anxious"),  
("Just another normal day", "Neutral"),  
("Feeling stressed and nervous", "Anxious")
```

]

Python Code (Zero / One / Few Shot Simulation) def

`emotion_detector(text):`

```
    text = text.lower()
```

```
    if any(word in text for word in ["great", "happy"]):
```

```
        return "Happy"    elif any(word in text for word
```

```
in ["sad", "lonely"]):
```

```
    return "Sad"    elif any(word in text for word in
```

```
["angry", "mad"]):
```



```

        return "Angry"    elif any(word in text for word in ["worried",
"nervous", "stressed"]):

        return "Anxious"

else:

    return "Neutral"

```

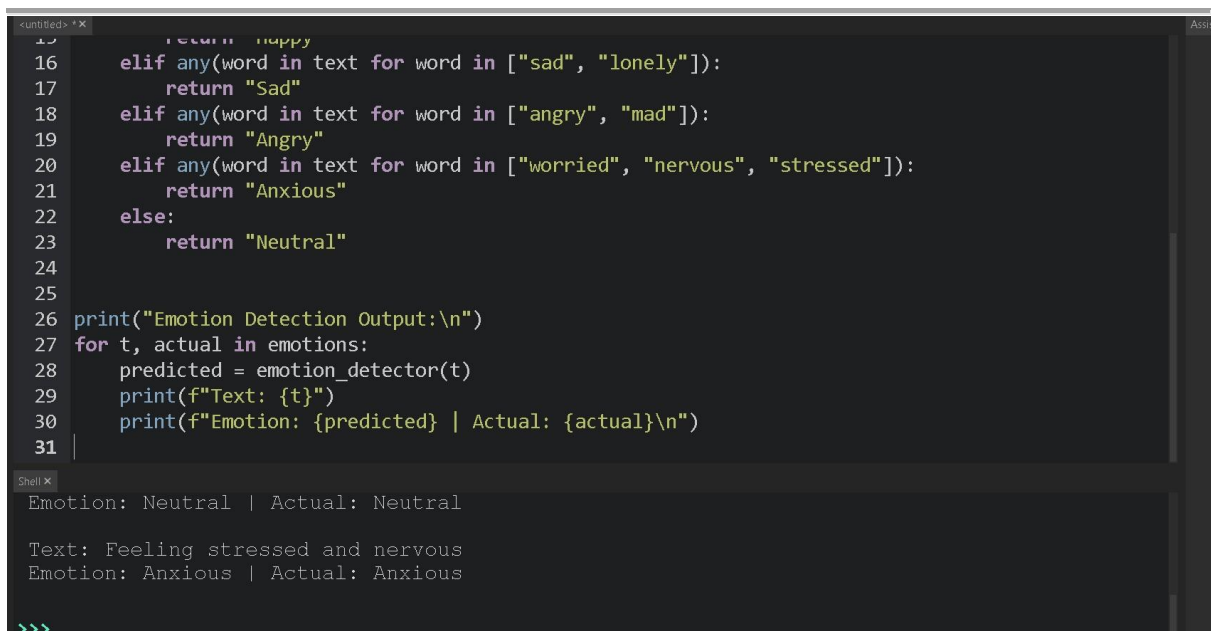
```

print("Emotion Detection Output:\n") for
t, actual in emotions:

    predicted = emotion_detector(t)

    print(f"Text: {t}")    print(f"Emotion: {predicted} |
Actual: {actual}\n")

```



The screenshot shows a code editor with a Python script for emotion detection. The script defines a function `emotion_detector` that returns one of five emotions based on keywords in the input text. Below the function, a loop iterates over a list of test texts, calling the function and printing the results. The terminal window below the editor shows the output of the script, displaying the predicted emotion for each text sample.

```

15     return "Happy"
16     elif any(word in text for word in ["sad", "lonely"]):
17         return "Sad"
18     elif any(word in text for word in ["angry", "mad"]):
19         return "Angry"
20     elif any(word in text for word in ["worried", "nervous", "stressed"]):
21         return "Anxious"
22     else:
23         return "Neutral"
24
25
26 print("Emotion Detection Output:\n")
27 for t, actual in emotions:
28     predicted = emotion_detector(t)
29     print(f"Text: {t}")
30     print(f"Emotion: {predicted} | Actual: {actual}\n")
31

```

```

Emotion: Neutral | Actual: Neutral

Text: Feeling stressed and nervous
Emotion: Anxious | Actual: Anxious
>>>

```

Sample Output

Text: I am worried about my future

Emotion: Anxious | Actual: Anxious

Emotion Detection

- The program detects emotions from text such as Happy, Sad, Angry, Anxious, or Neutral.
- A list of sample texts with actual emotion labels is created for testing.
- The function `emotion_detector()` takes a text as input.

- The text is converted to lowercase to avoid case mismatch.
- The program checks for specific emotion-related keywords using `any()`.
- If matching keywords are found, the corresponding emotion is returned.
- If no keywords match, the emotion is classified as Neutral.