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SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING																		
Program Name: B. Tech		Assignment Type: Lab	Academic Year: 2025-2026																	
Course Coordinator Name		Dr. Rishabh Mittal																		
Instructor(s) Name		<table border="1"> <tr><td>Mr. S Naresh Kumar</td></tr> <tr><td>Ms. B. Swathi</td></tr> <tr><td>Dr. Sasanko Shekhar Gantayat</td></tr> <tr><td>Mr. Md Sallauddin</td></tr> <tr><td>Dr. Mathivanan</td></tr> <tr><td>Mr. Y Srikanth</td></tr> <tr><td>Ms. N Shilpa</td></tr> <tr><td>Dr. Rishabh Mittal (Coordinator)</td></tr> <tr><td>Dr. R. Prashant Kumar</td></tr> <tr><td>Mr. Ankushavali MD</td></tr> <tr><td>Mr. B Viswanath</td></tr> <tr><td>Ms. Sujitha Reddy</td></tr> <tr><td>Ms. A. Anitha</td></tr> <tr><td>Ms. M.Madhuri</td></tr> <tr><td>Ms. Katherashala Swetha</td></tr> <tr><td>Ms. Velpula sumalatha</td></tr> <tr><td>Mr. Bingi Raju</td></tr> </table>		Mr. S Naresh Kumar	Ms. B. Swathi	Dr. Sasanko Shekhar Gantayat	Mr. Md Sallauddin	Dr. Mathivanan	Mr. Y Srikanth	Ms. N Shilpa	Dr. Rishabh Mittal (Coordinator)	Dr. R. Prashant Kumar	Mr. Ankushavali MD	Mr. B Viswanath	Ms. Sujitha Reddy	Ms. A. Anitha	Ms. M.Madhuri	Ms. Katherashala Swetha	Ms. Velpula sumalatha	Mr. Bingi Raju
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CourseCode	23CS002PC304	Course Title	AI Assisted Coding																	
Year/Sem	III/II	Regulation	R23																	
Date and Day of Assignment	Week1 – Wednesday	Time(s)	23CSBTB01 To 23CSBTB52																	
Duration	2 Hours	Applicable to Batches	All batches																	
Assignment Number:1.3(Present assignment number)/24(Total number of assignments)																				
Q.No.	Question	Expected Time to complete																		
1	Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI Lab Objectives:	Week1 - Monday																		

- ❖ To explore and evaluate the functionality of Google Gemini for AI-assisted coding within Google Colab.
- ❖ To understand and use Cursor AI for code generation, explanation, and refactoring.
- ❖ To compare outputs and usability between Gemini, GitHub Copilot, and Cursor AI.
- ❖ To perform code optimization and documentation using AI tools.

Lab Outcomes (LOs):

After completing this lab, students will be able to:

- ❖ Generate Python code using Google Gemini in Google Colab.
- ❖ Analyze the effectiveness of code explanations and suggestions by Gemini.
- ❖ Set up and use Cursor AI for AI-powered coding assistance.
- ❖ Evaluate and refactor code using Cursor AI features.
- ❖ Compare AI tool behavior and code quality across different platforms.

Task 1: Word Frequency from Text File

- ❖ **Scenario:**
You are analyzing log files for keyword frequency.
- ❖ **Task:**
Use Gemini to generate Python code that reads a text file and counts word frequency, then explains the code.
- ❖ **Expected Output:**
 - Working code
 - Explanation
 - Screenshot

```

1  from collections import Counter
2  import re
3
4  def count_word_frequency(file_path):
5      try:
6          with open(file_path, 'r') as file:
7              text = file.read().lower()
8              # Use regex to find words (ignoring punctuation)
9              words = re.findall(r'\b\w+\b', text)
10             word_counts = Counter(words)
11
12             print("Top 5 Word Frequencies:")
13             for word, count in word_counts.most_common(5):
14                 print(f"{word}: {count}")
15         except FileNotFoundError:
16             print("Error: The file 'sample.txt' was not found. Please upload it to Colab.")
17
18     # Note: Create a dummy file for testing
19     with open('sample.txt', 'w') as f:
20         f.write("Log: Error in system. Error detected. System rebooting. System stable.")
21
22     count_word_frequency('sample.txt')

```

```

PS C:\Users\shash> & 'c:\Users\shash\anaconda3\envs\Shashidhar\python.exe' 'c:\Users\shash\cursor\extensions\ms-python.debugpy->
\AAC A(2.3).py'
Top 5 Word Frequencies:
system: 3
error: 2
log: 1
in: 1
detected: 1
PS C:\Users\shash>

```

Task 2: File Operations Using Cursor AI

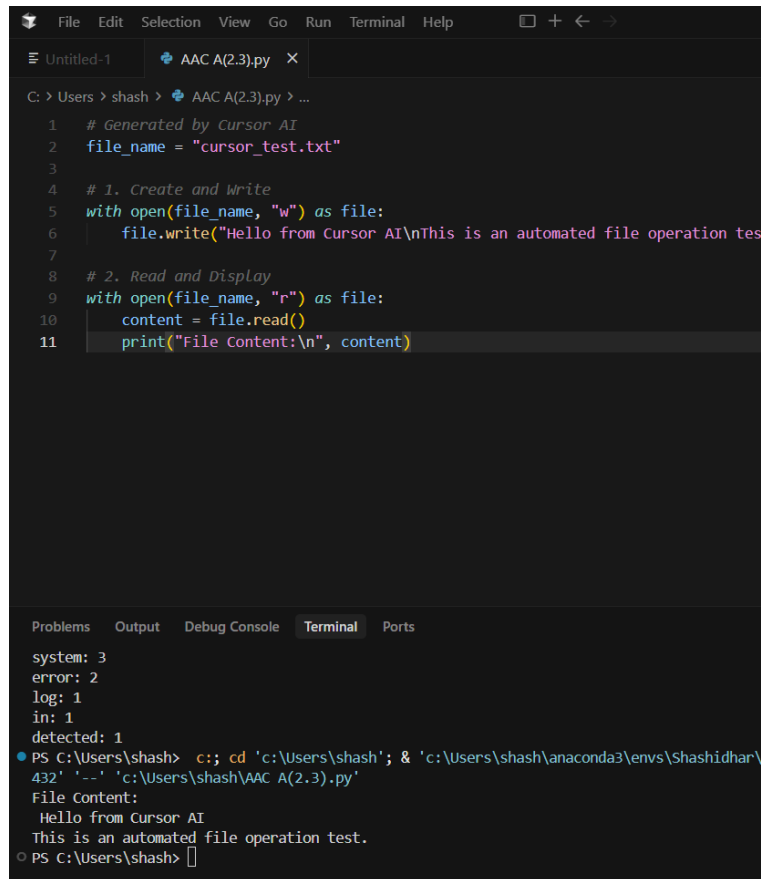
❖ **Scenario:**
You are automating basic file operations.

❖ **Task:**
Use Cursor AI to generate a program that:

- Creates a text file
- Writes sample text
- Reads and displays the content

❖ **Expected Output:**

- Functional code
- Cursor AI screenshots



```
File Edit Selection View Go Run Terminal Help
Untitled-1 AAC A(2.3).py x
C: > Users > shash > AAC A(2.3).py > ...
1  # Generated by Cursor AI
2  file_name = "cursor_test.txt"
3
4  # 1. Create and Write
5  with open(file_name, "w") as file:
6      file.write("Hello from Cursor AI\nThis is an automated file operation test")
7
8  # 2. Read and Display
9  with open(file_name, "r") as file:
10     content = file.read()
11     print("File Content:\n", content)

Problems Output Debug Console Terminal Ports
system: 3
error: 2
log: 1
in: 1
detected: 1
● PS C:\Users\shash> c;; cd 'c:\Users\shash'; & 'c:\Users\shash\anaconda3\envs\Shashidhar\432' '--' 'c:\Users\shash\AAC A(2.3).py'
File Content:
Hello from Cursor AI
This is an automated file operation test.
○ PS C:\Users\shash> 
```

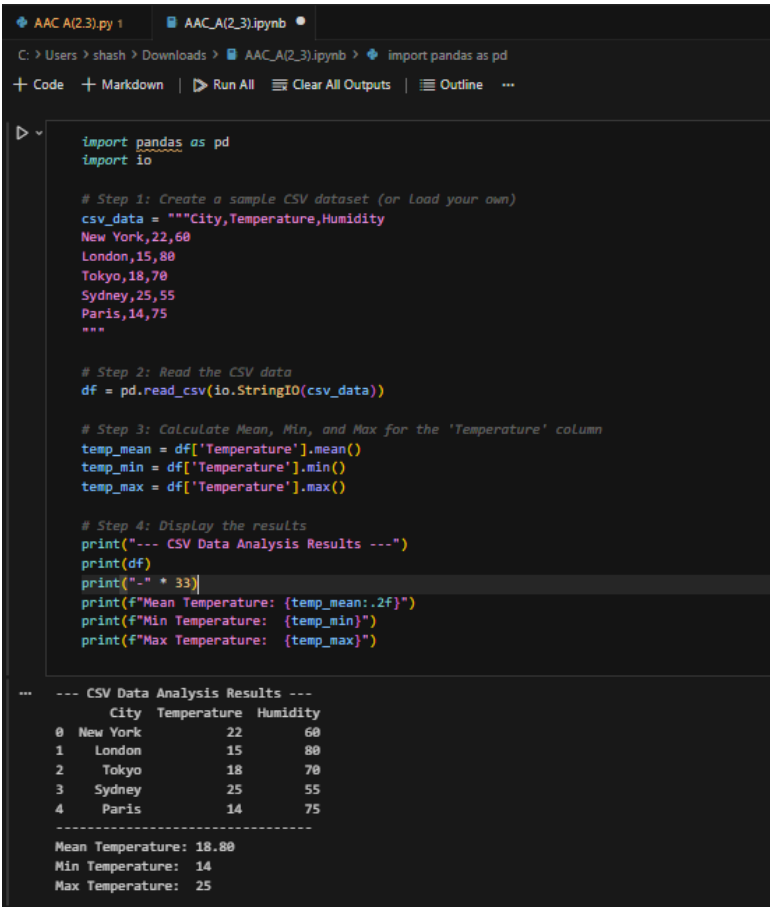
Task 3: CSV Data Analysis

❖ **Scenario:**
You are processing structured data from a CSV file.

❖ **Task:**
Use Gemini in Colab to read a CSV file and calculate mean, min, and max.

❖ **Expected Output:**

- Correct output
- Screenshot



```
import pandas as pd
import io

# Step 1: Create a sample CSV dataset (or Load your own)
csv_data = """City,Temperature,Humidity
New York,22,60
London,15,80
Tokyo,18,70
Sydney,25,55
Paris,14,75
"""

# Step 2: Read the CSV data
df = pd.read_csv(io.StringIO(csv_data))

# Step 3: Calculate Mean, Min, and Max for the 'Temperature' column
temp_mean = df['Temperature'].mean()
temp_min = df['Temperature'].min()
temp_max = df['Temperature'].max()

# Step 4: Display the results
print("--- CSV Data Analysis Results ---")
print(df)
print("\n * 33")
print(f"Mean Temperature: {temp_mean:.2f}")
print(f"Min Temperature: {temp_min}")
print(f"Max Temperature: {temp_max}")
```

--- CSV Data Analysis Results ---

	City	Temperature	Humidity
0	New York	22	60
1	London	15	80
2	Tokyo	18	70
3	Sydney	25	55
4	Paris	14	75

Mean Temperature: 18.80
Min Temperature: 14
Max Temperature: 25

Task 4: Sorting Lists – Manual vs Built-in

❖ **Scenario:**

You are reviewing algorithm choices for efficiency.

❖ **Task:**

Use **Gemini** to generate:

- Bubble sort
- Python's built-in sort()
- Compare both implementations.

❖ **Expected Output:**

- Two versions of code
- Short comparison

```
File Edit Selection View Go Run Terminal Help
AAC A(2.3).py X
C: > Users > shash > AAC A(2.3).py > ...
1 def bubble_sort(arr):
2     n = len(arr)
3     # Outer Loop to traverse through all array elements
4     for i in range(n):
5         # Last i elements are already in place, so we ignore them
6         for j in range(0, n - i - 1):
7             # Swap if the element found is greater than the next
8             if arr[j] > arr[j + 1]:
9                 arr[j], arr[j + 1] = arr[j + 1], arr[j]
10    return arr
11
12 # Example usage
13 data = [64, 34, 25, 12, 22, 11, 90]
14 print(f"Manual Bubble Sort: {bubble_sort(data.copy())}")

Problems Output Debug Console Terminal Ports
import pandas as pd
ModuleNotFoundError: No module named 'pandas'
PS C:\Users\shash> c:; cd 'c:\Users\shash'; & 'c:\Users\shash\anaconda3\envs\Shashid
'c:\Users\shash\AAC A(2.3).py'
Traceback (most recent call last):
  File "c:\Users\shash\AAC A(2.3).py", line 1, in <module>
    import pandas as pd
ModuleNotFoundError: No module named 'pandas'
PS C:\Users\shash> c:; cd 'c:\Users\shash'; & 'c:\Users\shash\anaconda3\envs\Shashid
'c:\Users\shash\AAC A(2.3).py'
Manual Bubble Sort: [11, 12, 22, 25, 34, 64, 90]
PS C:\Users\shash>
```

Note: Report should be submitted as a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots.