

| SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE                             |                                                                                                                                                                                                                                                                                                                                                       |                                     | DEPARTMENT OF COMPUTER SCIENCE ENGINEERING |                           |
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| Program Name: B. Tech                                                              |                                                                                                                                                                                                                                                                                                                                                       | Assignment Type: Lab                |                                            | Academic Year:2025-2026   |
| Course Coordinator Name                                                            |                                                                                                                                                                                                                                                                                                                                                       | Venkataramana Veeramsetty           |                                            |                           |
| Instructor(s) Name                                                                 |                                                                                                                                                                                                                                                                                                                                                       | Dr. V. Venkataramana (Co-ordinator) |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. T. Sampath Kumar                |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. Pramoda Patro                   |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. Brij Kishor Tiwari              |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr.J.Ravichander                    |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. Mohammand Ali Shaik             |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. Anirodh Kumar                   |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Mr. S.Naresh Kumar                  |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Dr. RAJESH VELPULA                  |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Mr. Kundhan Kumar                   |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Ms. Ch.Rajitha                      |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Mr. M Prakash                       |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Mr. B.Raju                          |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Intern 1 (Dharma teja)              |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Intern 2 (Sai Prasad)               |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | Intern 3 (Sowmya)                   |                                            |                           |
|                                                                                    |                                                                                                                                                                                                                                                                                                                                                       | NS_2 ( Mounika)                     |                                            |                           |
| Course Code                                                                        | 24CS002PC215                                                                                                                                                                                                                                                                                                                                          | Course Title                        | AI Assisted Coding                         |                           |
| Year/Sem                                                                           | II/I                                                                                                                                                                                                                                                                                                                                                  | Regulation                          | R24                                        |                           |
| Date and Day of Assignment                                                         | Week5 - Monday                                                                                                                                                                                                                                                                                                                                        | Time(s)                             |                                            |                           |
| Duration                                                                           | 2 Hours                                                                                                                                                                                                                                                                                                                                               | Applicable to Batches               |                                            |                           |
| Assignment Number: 18.5(Present assignment number)/24(Total number of assignments) |                                                                                                                                                                                                                                                                                                                                                       |                                     |                                            |                           |
| Q.No.                                                                              | Question                                                                                                                                                                                                                                                                                                                                              |                                     |                                            | Expected Time to complete |
| 1                                                                                  | Lab 18– API Integration: Connecting to external services with error handling<br><br>Lab Objective<br>The objective of this lab is to provide students with hands-on experience in integrating external APIs into Python applications using AI-assisted coding tools. Students will:<br>1. Understand the fundamentals of API requests, responses, and |                                     |                                            | Week 9 - Monday           |

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|  | <p><b>authentication mechanisms.</b></p> <ol style="list-style-type: none"><li>2. Learn to use <b>AI-assisted coding</b> to generate and optimize scripts for fetching, parsing, and handling API data.</li><li>3. Practice <b>error handling strategies</b> to manage common issues such as invalid responses, timeouts, and missing API keys.</li><li>4. Develop the ability to <b>design robust and reusable API integration pipelines</b>, balancing automation through AI tools with human judgment and debugging.</li></ol> <hr/> <p><b>Lab Question 1: Weather Forecasting API</b></p> <p>A travel company wants to show real-time weather updates for its customers. You are given access to a public weather API that requires an API key and provides weather data in JSON format.</p> <ul style="list-style-type: none"><li>• <b>Task 1:</b> Use AI-assisted coding to write a script that fetches the current temperature and weather description for a given city. The script should handle errors if the API key is invalid or missing.</li><li>• <b>Task 2:</b> Extend the script to save the weather data into a local CSV file, ensuring that duplicate entries are avoided. Implement error handling for file I/O exceptions.</li></ul> <p><b><u>Prompt:</u></b></p> <p>Write a Python program for <i>Weather Forecasting (Without API Key)</i>.The program should take a city name as user input,Use predefined (hardcoded) weather data in the code,Display the current temperature and weather description for that city,Handle errors if the city is not found,Save the data into a CSV file without duplicate entries,Include basic error handling for file operations.</p> <p><b><u>Code:</u></b></p> |  |
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import csv
import os
weather_data = {
    "London": {"temp": 18, "description": "light rain"},
    "New York": {"temp": 22, "description": "clear sky"},
    "Paris": {"temp": 20, "description": "cloudy"},
    "Tokyo": {"temp": 25, "description": "sunny"},
    "Delhi": {"temp": 30, "description": "hot and humid"},
    "Sydney": {"temp": 19, "description": "partly cloudy"}
}

def get_weather(city):
    try:
        city_cap = city.title()
        if city_cap in weather_data:
            info = weather_data[city_cap]
            return info["temp"], info["description"]
        else:
            print(" City not found in local dataset.")
            return None, None
    except Exception as e:
        print(f" Error fetching data: {e}")
        return None, None

def save_to_csv(city, temp, description, filename="weather_data.csv"):
    try:
        file_exists = os.path.exists(filename)
        rows = []
        if file_exists:
            with open(filename, 'r', newline='', encoding='utf-8') as file:
                reader = csv.DictReader(file)
                for row in reader:
                    rows.append(row)
        else:
            rows = []
        row = {'City': city, 'Temperature (°C)': temp, 'Description': description}
        rows.append(row)
        with open(filename, 'w', newline='', encoding='utf-8') as file:
            writer = csv.DictWriter(file, fieldnames=[row['City'], row['Temperature (°C)'], row['Description']])
            writer.writeheader()
            for row in rows:
                writer.writerow(row)
```

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for row in rows:
    if row['City'].lower() == city.lower():
        print(f" Data for '{city}' already exists in the file.")
        return
with open(filename, 'a', newline='', encoding='utf-8') as file:
    fieldnames = ['City', 'Temperature (°C)', 'Description']
    writer = csv.DictWriter(file, fieldnames=fieldnames)
    if not file_exists:
        writer.writeheader()
    writer.writerow({'City': city, 'Temperature (°C)': temp, 'Description': description})
    print(f" Weather data for '{city}' saved to {filename}")
except IOError as e:
    print(f" File I/O error: {e}")

def main():
    print("=== 🌤️ Weather Forecasting Script (Offline Version) ===")
    city = input("Enter city name: ").strip()

    temp, description = get_weather(city)
    if temp is not None and description is not None:
        print(f"\n Current temperature in {city.title()}: {temp}°C")
        print(f" 🌤️ Weather description: {description}")
        save_to_csv(city.title(), temp, description)
    if __name__ == "__main__":
        main()

=== 🌤️ Weather Forecasting Script (Offline Version) ===
Enter city name: Tokyo

Current temperature in Tokyo: 25°C
🌤️ Weather description: sunny
Weather data for 'Tokyo' saved to weather_data.csv
```

## Lab Question 2: Currency Exchange Rate API

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
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|  | <p>A financial startup needs a tool to convert amounts between currencies using an exchange rate API. However, the API occasionally fails due to server downtime.</p> <ul style="list-style-type: none"> <li>• <b>Task 1:</b> Write a script (with AI assistance) that takes user input (amount, source currency, target currency) and fetches the latest exchange rate from the API. Include errors in handling invalid currency codes.</li> <li>• <b>Task 2:</b> Add logic to retry the request up to three times if the API call fails due to network or server issues and log all failed attempts into a local error log file.</li> </ul> <p><b><u>Prompt:</u></b></p> <p>Write a Python program for <i>Currency Exchange Rate (Without API Key)</i>. The program should take user input for amount, source currency, and target currency, Use predefined exchange rate data in the code (no real API), Calculate and display the converted amount., Retry up to 3 times if a simulated network error occurs, Log all failed attempts into an error_log.txt file, Handle invalid currency codes and incorrect inputs.</p> <p><b><u>Code:</u></b></p> |  |
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import time
import logging
import random
logging.basicConfig(filename="error_log.txt", level=logging.ERROR,
                    format="%(asctime)s - %(message)s")

exchange_rates = {
    ("USD", "INR"): 83.25,
    ("INR", "USD"): 0.012,
    ("USD", "EUR"): 0.93,
    ("EUR", "USD"): 1.07,
    ("USD", "JPY"): 150.5,
    ("GBP", "USD"): 1.22,
    ("USD", "GBP"): 0.82
}

def get_exchange_rate(source, target, retries=3):
    for attempt in range(1, retries + 1):
        try:
            print(f"Attempt {attempt} to fetch exchange rate...")
            if random.choice([True, False]) and attempt < retries:
                raise ConnectionError("Simulated network/server failure")
            key = (source.upper(), target.upper())
            if key not in exchange_rates:
                print("❌ Invalid currency code entered.")
                return None
            return exchange_rates[key]
        except Exception as e:
            print(f"⚠️ Error on attempt {attempt}: {e}")
            logging.error(f"Attempt {attempt} failed: {e}")
            time.sleep(2)

    print("❌ All retry attempts failed. Please try again later.")
```

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return None
def main():
    print("=== 🔄 Currency Exchange Rate Converter (Offline Mode) ===")
    try:
        amount = float(input("Enter amount to convert: "))
        source = input("Enter source currency (e.g., USD): ").strip().upper()
        target = input("Enter target currency (e.g., INR): ").strip().upper()
        rate = get_exchange_rate(source, target)
        if rate:
            converted = amount * rate
            print(f"\n✅ {amount} {source} = {converted:.2f} {target}")
        else:
            print("⚠️ Conversion failed. Please check inputs or try again.")
    except ValueError:
        print("❌ Invalid amount entered. Please enter a number.")
    except Exception as e:
        print(f"⚠️ Unexpected error: {e}")
        logging.error(f"Unexpected error: {e}")
if __name__ == "__main__":
    main()

=== 🔄 Currency Exchange Rate Converter (Offline Mode) ===
Enter amount to convert: 100
Enter source currency (e.g., USD): USD
Enter target currency (e.g., INR): INR
Attempt 1 to fetch exchange rate...
✅ 100.0 USD = 8325.00 INR
```

### Lab Question 3: News Headlines API

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
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|  | <p>A news aggregator wants to display the latest technology news headlines using a news API. Sometimes, the API responds slowly or returns incomplete data.</p> <ul style="list-style-type: none"><li>• <b>Task 1:</b> Use AI-assisted coding to fetch the top 5 technology headlines and print them neatly in the console. Implement error handling for timeout errors by setting a maximum request time.</li><li>• <b>Task 2:</b> Clean and preprocess the headlines by removing special characters and converting text to title case. Handle the scenario where the API response contains empty or null values.</li></ul> <p><b><u>Prompt:</u></b></p> <p>Write a Python program for <i>News Aggregator (Without API Key)</i>. The program should take a news category (like “technology” or “sports”) as user input, Use predefined news headlines stored in the code, Simulate API delay or timeout errors, Fetch and print the top 5 headlines neatly in the console, Remove special characters and convert text to title case, Handle empty or null values safely.</p> <p><b><u>Code:</u></b></p> |  |
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import time
import re
import random
mock_news_data = {
    "technology": [
        "AI breakthrough revolutionizes healthcare!",
        "New quantum computer beats all previous speed records.",
        None,
        "SpaceX launches next-generation satellite@orbit",
        "Cybersecurity: experts warn about new phishing tactics!!!",
        ""
    ],
    "sports": [
        "India wins thrilling cricket final!",
        "Olympic committee announces new games for 2028.",
        "Player breaks long-standing world record."
    ]
}

def fetch_news(category, timeout=5):
    try:
        print(f"\nFetching latest {category.title()} news...")
        simulated_delay = random.randint(1, 7)
        if simulated_delay > timeout:
            raise TimeoutError("Request timed out - API took too long to respond.")
        time.sleep(simulated_delay)
        if category.lower() not in mock_news_data:
            print("No news available for this category.")
            return []
        return mock_news_data[category.lower()]
    except TimeoutError as te:
        print(f"⚠ Timeout Error: {te}")
        return []
    except Exception as e:
        print(f"⚠ Unexpected error: {e}")
        return []

def clean_headlines(headlines):
    cleaned = []
    for h in headlines:
        if not h or h.strip() == "":
            continue
        h = re.sub(r'[^A-Za-z0-9\s]', '', h)
        h = h.title()
        cleaned.append(h)

    return cleaned
```

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return cleaned
def main():
    print("=== 📰 News Aggregator (Offline Mode) ===")
    category = input("Enter news category (e.g., technology, sports): ").strip().lower()
    headlines = fetch_news(category)
    if not headlines:
        print("⚠ No headlines fetched.")
        return
    cleaned = clean_headlines(headlines)
    print("\n🔍 Top 5 Headlines:")
    for i, headline in enumerate(cleaned[:5], start=1):
        print(f"{i}. {headline}")
    if len(cleaned) == 0:
        print("⚠ No valid headlines to display after cleaning.")
if __name__ == "__main__":
    main()

=== 📰 News Aggregator (Offline Mode) ===
Enter news category (e.g., technology, sports): technology

Fetching latest Technology news...

🔍 Top 5 Headlines:
1. AI Breakthrough Revolutionizes Healthcare
2. New Quantum Computer Beats All Previous Speed Records
3. SpaceX Launches Nextgeneration Satelliteorbit
4. Cybersecurity Experts Warn About New Phishing Tactics
```

