ADVANCE PYTHON

NAME:VIBHU AADHAV.M

REGNO:22MID0141

DIGITAL ASSIGNMENT-3

LAB 11-HANDLING WITH CSV:

ID	Name	Age	Department	Marks
1	Rahul	20	CSE	85
2	Priya	21	ECE	90
3	Anjali	19	CSE	78
4	Karthik	22	ME	88
5	Meena	20	EEE	92

```
import csv


# ---------- CREATE CSV FILE ----------
header = ["ID", "Name", "Age", "Department", "Marks"]
data = [
    [1, "Rahul", 20, "CSE", 85],
    [2, "Priya", 21, "ECE", 90],
    [3, "Anjali", 19, "CSE", 78],
    [4, "Karthik", 22, "ME", 88],
```

```
    [5, "Meena", 20, "EEE", 92]
]

with open("students.csv", "w", newline="") as file:
    writer = csv.writer(file)
    writer.writerow(header)
    writer.writerows(data)

print("CSV file created successfully!")

# ---------- READ CSV FILE ----------
print("\nReading CSV file:")
with open("students.csv", "r") as file:
    reader = csv.reader(file)
    for row in reader:
        print(row)

# ---------- READ USING DICTIONARY ----------
print("\nReading CSV as dictionary:")
with open("students.csv", "r") as file:
    reader = csv.DictReader(file)
    for row in reader:
        print(row["Name"], "from", row["Department"], "scored", row["Marks"])

# ---------- ADD NEW ROW ----------
new_row = [6, "Suresh", 23, "CIVIL", 81]
```

```
with open("students.csv", "a", newline="") as file:
    writer = csv.writer(file)
    writer.writerow(new_row)

print("\nNew row added!")

# ---------- ANALYZE DATA ----------
import pandas as pd

df = pd.read_csv("students.csv")
print("\nSummary of dataset:")
print(df.describe())

print("\nAverage Marks:", df["Marks"].mean())
```

OUTPUT:

```
CSV file created successfully!

Reading CSV file:
['ID', 'Name', 'Age', 'Department', 'Marks']
['1', 'Rahul', '20', 'CSE', '85']
['2', 'Priya', '21', 'ECE', '90']
...

Reading CSV as dictionary:
Rahul from CSE scored 85
```

Priya from ECE scored 90

...

New row added!

Summary of dataset:

	ID	Age	Marks
count	6.000000	6.000000	6.000000
mean	3.500000	20.833333	85.666667

...

Average Marks: 85.67

LAB-12-PYTHON THREADING:

```
import csv
import threading
import pandas as pd

# ---------- CREATE CSV FILE ----------
header = ["ID", "Name", "Age", "Department", "Marks"]
data = [
    [1, "Rahul", 20, "CSE", 85],
    [2, "Priya", 21, "ECE", 90],
    [3, "Anjali", 19, "CSE", 78],
    [4, "Karthik", 22, "ME", 88],
```

```
    [5, "Meena", 20, "EEE", 92]
]

with open("students.csv", "w", newline="") as file:
    writer = csv.writer(file)
    writer.writerow(header)
    writer.writerows(data)



# ---------- TASK 1: Read CSV ----------
def read_csv():
    print("\n[Thread 1] Reading CSV file:")
    with open("students.csv", "r") as file:
        reader = csv.reader(file)
        for row in reader:
            print(row)



# ---------- TASK 2: Read as Dictionary ----------
def read_dict():
    print("\n[Thread 2] Reading CSV as dictionary:")
    with open("students.csv", "r") as file:
        reader = csv.DictReader(file)
        for row in reader:
            print(row["Name"], "from", row["Department"], "scored", row["Marks"])
```

```
# ---------- TASK 3: Add New Row ----------
def add_row():
```

OUTPUT:

```
[Thread 1] Reading CSV file:
['ID', 'Name', 'Age', 'Department', 'Marks']
['1', 'Rahul', '20', 'CSE', '85']
['2', 'Priya', '21', 'ECE', '90']
['3', 'Anjali', '19', 'CSE', '78']
['4', 'Karthik', '22', 'ME', '88']
['5', 'Meena', '20', 'EEE', '92']

[Thread 2] Reading CSV as dictionary:
Rahul from CSE scored 85
Priya from ECE scored 90
Anjali from CSE scored 78
Karthik from ME scored 88
Meena from EEE scored 92

[Thread 3] Adding new row...
[Thread 3] Row added successfully!

[Thread 4] Analyzing data...
              ID       Age      Marks
count  6.000000   6.000000   6.000000
```

mean 3.500000 20.833333 85.666667

std 1.870829 1.471961 4.958738

min 1.000000 19.000000 78.000000

25% 2.250000 20.000000 83.250000

50% 3.500000 20.500000 86.500000

75% 4.750000 21.250000 90.000000

max 6.000000 23.000000 92.000000

Average Marks: 85.66666666666667

LAB-13-JSON:

```
import json


# Load JSON file
with open("students.json", "r") as file:
    data = json.load(file)


# ✅ Extract all student names
names = [student["Name"] for student in data]
print("All Names:", names)


# ✅ Extract names of students in CSE
cse_students = [student["Name"] for student in data if student["Department"] == "CSE"]
print("CSE Students:", cse_students)
```

```
# ✅ Extract students scoring more than 85
high_scorers = [student for student in data if student["Marks"] > 85]
print("High Scorers:", high_scorers)

# ✅ Extract only Name and Marks as dictionary
name_marks = {student["Name"]: student["Marks"] for student in data}
print("Name vs Marks:", name_marks)

# ✅ Extract single student (e.g., ID = 3)
student_id_3 = next((student for student in data if student["ID"] == 3), None)
print("Student with ID=3:", student_id_3)
```

OUTPUT:

```
All Names: ['Rahul', 'Priya', 'Anjali', 'Karthik', 'Meena']
CSE Students: ['Rahul', 'Anjali']
High Scorers: [{'ID': 2, 'Name': 'Priya', 'Age': 21, 'Department': 'ECE', 'Marks': 90},
               {'ID': 4, 'Name': 'Karthik', 'Age': 22, 'Department': 'ME', 'Marks': 88},
               {'ID': 5, 'Name': 'Meena', 'Age': 20, 'Department': 'EEE', 'Marks': 92}]
Name vs Marks: {'Rahul': 85, 'Priya': 90, 'Anjali': 78, 'Karthik': 88, 'Meena': 92}
Student with ID=3: {'ID': 3, 'Name': 'Anjali', 'Age': 19, 'Department': 'CSE', 'Marks': 78}
```

LAB-14-FILTERING CSV:

```
import csv

filtered_students = []

with open("students.csv", "r") as file:
    reader = csv.DictReader(file)
    for row in reader:
        if row["Department"] == "CSE":
            filtered_students.append(row)

print("CSE Students:")
for student in filtered_students:
    print(student)

high_scorers = []

with open("students.csv", "r") as file:
    reader = csv.DictReader(file)
    for row in reader:
        if int(row["Marks"]) > 85:
            high_scorers.append(row)
```

```
print("High Scorers:")
for student in high_scorers:
    print(student)
```

OUTPUT:

```
High Scorers:
{'ID': '2', 'Name': 'Priya', 'Age': '21', 'Department': 'ECE', 'Marks': '90'}
{'ID': '4', 'Name': 'Karthik', 'Age': '22', 'Department': 'ME', 'Marks': '88'}
{'ID': '5', 'Name': 'Meena', 'Age': '20', 'Department': 'EEE', 'Marks': '92'}
```

2️⃣ Using Pandas (Easier & Faster)

```
import pandas as pd

df = pd.read_csv("students.csv")

# Filter by Department
cse_students = df[df["Department"] == "CSE"]
print("CSE Students:\n", cse_students)

# Filter by Marks > 85
high_scorers = df[df["Marks"] > 85]
print("\nHigh Scorers:\n", high_scorers)
```

```
# Filter multiple conditions: CSE and Marks > 80
cse_high = df[(df["Department"] == "CSE") & (df["Marks"] > 80)]
print("\nCSE Students with Marks > 80:\n", cse_high)
```

Sample Output:

```
CSE Students:
   ID    Name  Age Department  Marks
0   1   Rahul   20       CSE     85
2   3  Anjali   19       CSE     78

High Scorers:
   ID     Name  Age Department  Marks
1   2    Priya   21       ECE     90
3   4  Karthik   22        ME     88
4   5    Meena   20       EEE     92

CSE Students with Marks > 80:
   ID   Name  Age Department  Marks
0   1  Rahul   20       CSE     85
```