**CASE STUDY :** Analysis of System Resource Usage

**Implementation**

***main.py***

import subprocess  
import schedule  
import time  
  
def job():  
 subprocess.run(["python", "collect\_data.py"])  
  
schedule.every(2).seconds.do(job)  
  
while True:  
 schedule.run\_pending()  
 time.sleep(1)

***collect\_data.py***

import os  
import psutil  
import csv  
import datetime  
import logging  
  
timestamp = datetime.datetime.now()  
  
cpu\_usage = psutil.cpu\_percent(1)  
process = psutil.Process(os.getpid())  
mem\_usage = process.memory\_percent()  
disk\_usage = psutil.disk\_usage('/').percent  
  
row = {'timestamp': timestamp, 'cpu\_usage': cpu\_usage, 'memory\_usage': mem\_usage, 'disk\_usage': disk\_usage}  
with open('system\_resource.csv', 'a', newline='') as f:  
 writer = csv.DictWriter(f, fieldnames=row.keys())  
 writer.writerow(row)  
  
logging.basicConfig(filename='system\_resource.log', level=logging.DEBUG)  
logging.debug(f"{timestamp} | {cpu\_usage} | {mem\_usage} |{disk\_usage}")

***statistics.py***

import numpy as np  
import pandas as pd  
import matplotlib.pyplot as plt  
  
# Read the data  
df = pd.read\_csv("system\_resource.csv", names=['timestamp', 'cpu\_usage', 'memory\_usage', 'disk\_usage'])  
  
# Overview of data  
print(df.info())  
  
timestamp = df['timestamp']  
cpu\_usage = df['cpu\_usage']  
memory\_usage = df['memory\_usage']  
disk\_usage = df['disk\_usage']  
  
mean\_cpu = np.mean(cpu\_usage)  
mean\_mem = np.mean(memory\_usage)  
mean\_disk = np.mean(disk\_usage)  
  
median\_cpu = np.median(cpu\_usage)  
median\_mem = np.median(memory\_usage)  
median\_disk = np.median(disk\_usage)  
  
std\_cpu = np.std(cpu\_usage)  
std\_mem = np.std(memory\_usage)  
std\_disk = np.std(disk\_usage)  
  
print("\nStatistics of CPU Usage :: ")  
print(f"Mean: {mean\_cpu}, Median: {median\_cpu}, Standard Deviation: {std\_cpu}")  
  
print("\nStatistics of Memory Usage :: ")  
print(f"Mean: {mean\_mem}, Median: {median\_mem}, Standard Deviation: {std\_mem}")  
  
print("\nStatistics of Disk Usage :: ")  
print(f"Mean: {mean\_disk}, Median: {median\_disk}, Standard Deviation: {std\_disk}")  
  
  
# Plot the data  
plt.plot(timestamp, cpu\_usage, label="CPU Usage")  
plt.xlabel("Timestamp")  
plt.ylabel("CPU Usage")  
plt.title("CPU Usage over Time")  
plt.legend()  
plt.show()  
  
plt.plot(timestamp, memory\_usage, label="Memory Usage")  
plt.xlabel("Timestamp")  
plt.ylabel("Memory Usage")  
plt.title("Memory Usage over Time")  
plt.legend()  
plt.show()  
  
plt.plot(timestamp, disk\_usage, label="Disk Usage")  
plt.xlabel("Timestamp")  
plt.ylabel("Disk Usage")  
plt.title("Disk Usage over Time")  
plt.legend()  
plt.show()

**Output**













