Python programming Lab(23CP301P)

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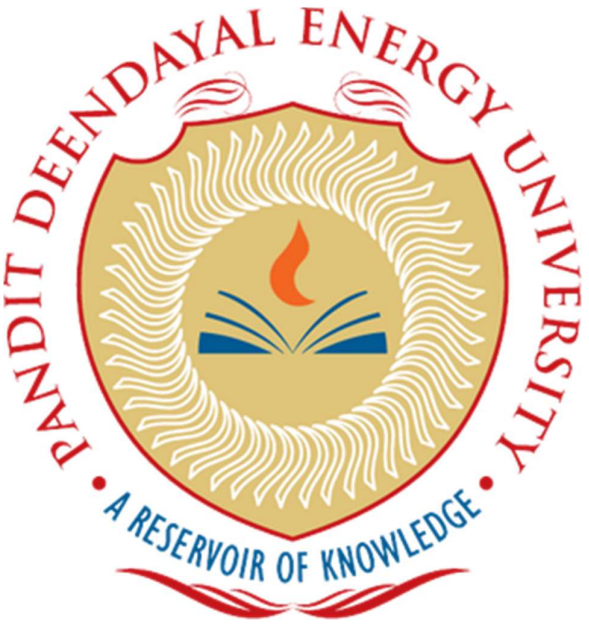

School of Technology

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Experiment No: 5

JSON Data Parsing and Manipulation

Objective: To develop a Python program that reads and analyzes structured JSON files containing COVID19 data across multiple countries, computes summary statistics, identifies extreme cases, and generates a consolidated report.

Code:

```
import os
import json


def read_json_files(directory):


  covid_data = []
  for root, _, files in os.walk(directory):
    for file in files:
      if file.endswith(".json"):
        file_path = os.path.join(root, file)
        try:
          with open(file_path, "r") as f:
            data = json.load(f)
            covid_data.append(data)
        except Exception as e:
          print(f"Error reading {file_path}: {e}")
  return covid_data


def process_covid_data(covid_data):
```

```
summary = {}

for record in covid_data:
    country = record["country"]
    confirmed_total = record["confirmed_cases"]["total"]
    deaths_total = record["deaths"]["total"]
    recovered_total = record["recovered"]["total"]

    if country not in summary:
        summary[country] = {
            "total_confirmed": 0,
            "total_deaths": 0,
            "total_recovered": 0
        }

    summary[country]["total_confirmed"] += confirmed_total
    summary[country]["total_deaths"] += deaths_total
    summary[country]["total_recovered"] += recovered_total

for country, stats in summary.items():
    stats["total_active"] = stats["total_confirmed"] - (
        stats["total_deaths"] + stats["total_recovered"]
```

```
        )

    return summary

def find_extremes(summary):

    sorted_countries = sorted(summary.items(), key=lambda x:
x[1]["total_confirmed"], reverse=True)

    top_5_highest = sorted_countries[:5]
    top_5_lowest = sorted_countries[-5:]

    return top_5_highest, top_5_lowest

def save_summary(summary, output_file="covid19_summary.json"):

    with open(output_file, "w") as f:
        json.dump(summary, f, indent=4)
    print(f"Summary report saved to {output_file}")

if __name__ == "__main__":
    directory = "covid_data"
    covid_data = read_json_files(directory)
    summary = process_covid_data(covid_data)
```

```
  print("\n--- COVID-19 Statistics by Country ---")
  for country, stats in summary.items():
    print(f"{country}: {stats}")



  top_highest, top_lowest = find_extremes(summary)

  print("\nTop 5 countries with highest confirmed cases:")
  for country, stats in top_highest:
    print(f"{country}: {stats['total_confirmed']}")

  print("\nTop 5 countries with lowest confirmed cases:")
  for country, stats in top_lowest:
    print(f"{country}: {stats['total_confirmed']}")



  save_summary(summary)
```

output:

```
PS C:\Users\kinu\Desktop\python> python -u "c:\Users\kinu\Desktop\python\lab5.py"

--- COVID-19 Statistics by Country ---
Brazil: {'total_confirmed': 15000000, 'total_deaths': 410000, 'total_recovered': 13500000, 'total_active': 1090000}
India: {'total_confirmed': 20000000, 'total_deaths': 220000, 'total_recovered': 16000000, 'total_active': 3780000}
USA: {'total_confirmed': 32000000, 'total_deaths': 570000, 'total_recovered': 25000000, 'total_active': 6430000}

Top 5 countries with highest confirmed cases:
USA: 32000000
India: 20000000
Brazil: 15000000

Top 5 countries with lowest confirmed cases:
USA: 32000000
India: 20000000
Brazil: 15000000
Summary report saved to covid19_summary.json
PS C:\Users\kinu\Desktop\python>
```