

Lab Assignment 28

Student Name: Chauhan Vandana Ramdayal

Student Id: AF0411629

Topic: SciPy Introduction

What is SciPy

The SciPy is an open-source scientific library of Python that is distributed under a BSD license. It is used to solve the complex scientific and mathematical problems. It is built on top of the Numpy extension, which means if we import the SciPy, there is no need to import Numpy. The **SciPy** is pronounced as **Sigh pi**, and it depends on the Numpy, including the appropriate and fast N-dimension array manipulation.

It provides many user-friendly and effective numerical functions for numerical integration and optimization.

The **SciPy** library supports **integration, gradient optimization, special functions, ordinary differential equation solvers, parallel programming tools**, and many more. We can say that **SciPy** implementation exists in every complex numerical computation.

Question:

task 1: To find Area of the circle

https://raw.githubusercontent.com/AnudipAE/DANLC/master/radius_data.csv

Code:

```
#Q1.Task-2 To find the circle.
import pandas as pd
from scipy.constants import pi
df = pd.read_csv("https://raw.githubusercontent.com/AnudipAE/DANLC/master/radius_data.csv")
df["Area"] = (pi * df["Radius"] ** 2)# Calculate the area of circles using the formula: Area = pi * r^2
df.to_csv('output.csv', index=False) # Save the updated DataFrame to a new CSV file
print(df) # Print the updated DataFrame to the console
```

Output:

	CircleName	Radius	Area
0	SAY	3.798717	45.333960
1	PSN	9.958397	311.550720
2	JDP	5.142711	83.087197
3	AUO	3.319584	34.619210
4	OHG	1.138395	4.071325
..
95	PVZ	7.798122	191.042457
96	SQR	5.133239	82.781400
97	NSM	9.761868	299.375156
98	SXE	6.774164	144.165471
99	JNT	2.823492	25.045121

[100 rows x 3 columns]

task 2: To Convert Celsius into Fahrenheit

https://raw.githubusercontent.com/d4dipdas/DANLC/main/city_temperatures.csv

Code:

```
import pandas as pd
from scipy.constants import convert_temperature

# Read the CSV file from the URL
df = pd.read_csv("https://raw.githubusercontent.com/d4dipdas/DANLC/main/city_temperatures.csv")

print(df.columns) # Check the column names to confirm
# Assuming the column name is 'Temperature (°C)' with a space before the parentheses
cel_temp = df['Temperature (°C)']
fahr_temp = convert_temperature(cel_temp, "celsius", "fahrenheit") # Convert Celsius to Fahrenheit
df['Temperature (°F)'] = fahr_temp # Create a new column for Fahrenheit
df.to_csv('output1.csv', index=False)
print(df)
```

Output:

	City	Temperature (°C)	Temperature (°F)
0	Los Angeles	35.8	96.44
1	Chicago	8.1	46.58
2	San Francisco	0.2	32.36
3	Chicago	36.2	97.16
4	Boston	37.9	100.22
..
95	Seattle	39.7	103.46
96	Boston	1.5	34.70
97	San Francisco	36.2	97.16
98	New York	-0.3	31.46
99	Chicago	21.1	69.98

[100 rows x 3 columns]