

ED5340:Data Science: Theory and practice

[Dashboard](#) / [My courses](#) / [ED5340:JAN-MAY 2024](#) / [LAB 7 : LIBRARIES & OPTIMIZATION](#) / [LAB 7 : LIBRARIES & OPTIMIZATION PART A](#)

LAB 7 : LIBRARIES & OPTIMIZATION PART A

✓ Done

Opened: Wednesday, 6 March 2024, 1:30 PM

Due: Wednesday, 6 March 2024, 5:00 PM

1. Write a program that takes coefficients A, B, C, D, and E as inputs representing a 4th degree polynomial in the form $Ax^4 + Bx^3 + Cx^2 + Dx + E$. Calculate the values of this polynomial for x in the range from -100 to 100, with constant discrete intervals.

Store the resulting x and y values as a NumPy array, where x represents the input values, and y represents the corresponding output values of the polynomial. Finally, use Matplotlib to plot the graph using the generated NumPy array.

2. Suppose you have a dictionary containing information about monthly sales for different products over a period of time. The dictionary has the following structure.

```
sales_data = {  
    'Product': ['A', 'B', 'A', 'C', 'B', 'C', 'A', 'B', 'C'],  
    'Month': ['Jan', 'Jan', 'Feb', 'Feb', 'Mar', 'Mar', 'Apr', 'Apr', 'Apr'],  
    'Sales': [100, 150, 200, 120, 180, 220, 90, 110, 130]  
}
```

Write a Python script to convert this dictionary into a pandas DataFrame, calculate the total sales for each product over the entire period, and then create a bar plot using matplotlib to visualize the total sales for each product.

3. Create visualizations for the following mathematical functions using Matplotlib:

Plot the following single-variable functions over the range

$[-10, 10]$, and include a title and labels for the axes:

(1) $y = \cos(x)$

(2) $y = e^x$

(3) $y = \log(x)$, where $x > 0$

Generate surface plots for these multi-variable functions over the range

$x = [-10, 10]$ and $y = [-10, 10]$, ensuring to add a title and labels for all axes:

(1) $z = \cos(\sqrt{x^2 + y^2})$

(2) $z = e^{-(x^2 + y^2)}$


(3) $z = \log(x^2 + y^2)$ where $x^2 + y^2 > 0$

4. For the function $J(w) = w^2 + (54/w)$, implement the bracketing method (choose your own a, b, n).

Edit submission

Remove submission

Submission status

Submission status	Submitted for grading
Grading status	Graded
Time remaining	Assignment was submitted 1 min 4 secs early
Last modified	Wednesday, 6 March 2024, 4:58 PM
File submissions	<div><div></div><div>AM23M022 LAB7 PART1 06 03 2024.py 6 March 2024, 4:58 PM</div></div>
Submission comments	<div><div></div><div>▶ Comments (0)</div></div>

Feedback

Grade	10.00 / 10.00
Graded on	Wednesday, 22 May 2024, 11:51 PM
Graded by	eM ed19b017 M JASWANTH KUMAR

[◀ CW 6: 04/03/2024](#)

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