Lab Assignment 20

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Topic: Numpy Mathematical Function

NumPy Mathematical Functions

Numpy contains a large number of mathematical functions which can be used to perform various mathematical operations. The mathematical functions include trigonometric functions, arithmetic functions, and functions for handling complex numbers. Let's discuss the mathematical functions.

Trigonometric functions

Numpy contains the trigonometric functions which are used to calculate the sine, cosine, and tangent of the different angles in radian.

1. Calculate the total revenue generated by two product categories in a store

Input: category1_revenue = np.array([500, 600, 700, 550])

category2_revenue = np.array([450, 700, 800, 600])

Output: Total Revenue: [950 1300 1500 1150]

Code:

```
import numpy as np
category1_revenue = np.array([500, 600, 700, 550])
category2_revenue = np.array([450, 700, 800, 600])
Total_revenue = category1_revenue +category2_revenue  # Calculate the Total_revenue by Adding category1_revenue and category2_revenue
print(Total_revenue)
```

Output:

```
[ 950 1300 1500 1150]
```

2. Calculate the profit made by a company

Input: revenue = np.array([10000, 12000, 11000, 10500])

expenses = np.array([4000, 5000, 4500, 4800])

Output: Profit: [6000 7000 6500 5700]

Code:

```
import numpy as np
revenue = np.array([10000, 12000, 11000, 10500])
expenses = np.array([4000, 5000, 4500, 4800])
Profit = revenue-expenses # Calculate the profit by subtracting expenses from revenue
print(Profit)
```

Output:

```
 vscode/Mathematical.py"
 [6000 7000 6500 5700]
```

3. Determine which products in a store are out of stock (quantity is 0).

Input: inventory = np.array([10, 0, 5, 0, 20, 0])

Output: Out of Stock Products: [0 0 0]

Code:

```
import numpy as np
inventory = np.array([10, 0, 5, 0, 20, 0])
# Use boolean indexing to select the products with a quantity of 0
# This will return an array containing only the values where the condition is true
out_of_stock_indices = inventory[inventory == 0]
print("Out of Stock Products:", out_of_stock_indices)
```

Output:-

```
vscode/Mathematical.py"
Out of Stock Products: [0 0 0]
```

4.Calculate the total cost of items in a shopping cart, considering the quantity and price per item.

Input: quantity = np.array([2, 3, 4, 1])

price_per_item = np.array([10.0, 5.0, 8.0, 12.0])

Output: Total Cost of Items: [20. 15. 32. 12.]

Code:

```python
import numpy as np
quantity = np.array([2, 3, 4, 1])
price_per_item = np.array([10.0, 5.0, 8.0, 12.0])
Total_cost = quantity*price_per_item   # Calculate the total cost by multiplying the quantity and price_per_item arrays element-wise
print(Total_cost)
```

Output:

```
vscode/Mathematical.py"
[20. 15. 32. 12.]
```