

FUNDAMENTALS OF DATA SCIENCE

LAB EXPERIMENTS DAY 1

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DHARANI M

192324008

1.

```
import numpy as np
```

```
student_scores = np.loadtxt("student.csv", delimiter=",", skiprows=1, usecols=(1, 2, 3, 4))
```

```
subjects = ["Math", "Science", "English", "History"]
```

```
average_scores = np.mean(student_scores, axis=0)
```

```
highest_subject = subjects[np.argmax(average_scores)]
```

```
print("Average scores:", np.round(average_scores,2))
```

```
print("Subject with highest average score:", highest_subject)
```

OUTPUT:

```
student_scores = np.loadtxt("student.csv", delimiter=",", skiprows=1, usecols=(1, 2, 3, 4))
subjects = ["Math", "Science", "English", "History"]

average_scores = np.mean(student_scores, axis=0)

highest_subject = subjects[np.argmax(average_scores)]

print("Average scores:", np.round(average_scores,2))
print("Subject with highest average score:", highest_subject)
|
```

```
... Average scores: [81.97 82.56 82.97 82.88]
   Subject with highest average score: English
```

2.

```
import pandas as pd
```

```
df=pd.read_csv("sales.csv")
```

```
average_price = df[df["Month_sales"]==" November 2023"]["Price"].mean()
```

```
print("Average price in November 2023 (Past Month): ",round(average_price, 2))
```

OUTPUT:

```
df=pd.read_csv("sales.csv")
average_price = df[df["Month_sales"]==" November 2023"]["Price"].mean()
print("Average price in November 2023 (Past Month): ",round(average_price, 2))
```

```
... Average price in November 2023 (Past Month):  nan
```

3.

```
import numpy as np
house_data = np.array([
    [3, 1200, 4500000],
    [5, 1800, 7500000],
    [4, 1500, 6000000],
    [6, 2200, 9000000],
    [5, 2000, 8500000]
])

filtered_houses = house_data[house_data[:, 0] > 4]

average_price = np.mean(filtered_houses[:, 2])

print("Average Sale Price of Houses with More Than 4 Bedrooms:", average_price)
```

OUTPUT:

```
✓ ... filtered_houses = house_data[house_data[:, 0] > 4]
    average_price = np.mean(filtered_houses[:, 2])
    print("Average Sale Price of Houses with More Than 4 Bedrooms:", average_
    ... Average Sale Price of Houses with More Than 4 Bedrooms: 8333333.333333333
```

4.

```
import numpy as np
sales_data = np.array([120, 150, 180, 220])
total_sales = np.sum(sales_data)
percentage_increase = ((sales_data[3] - sales_data[0]) / sales_data[0]) * 100

print("Total Sales for the Year:", total_sales)
print("Percentage Increase from Q1 to Q4:", round(percentage_increase, 2), "%")
```

OUTPUT:

```
sales_data = np.array([120, 150, 180, 220])
total_sales = np.sum(sales_data)
percentage_increase = ((sales_data[3] - sales_data[0]) / sales_data[0]) *

print("Total Sales for the Year:", total_sales)
print("Percentage Increase from Q1 to Q4:", round(percentage_increase, 2))
```

```
... Total Sales for the Year: 670
Percentage Increase from Q1 to Q4: 83.33 %
```

```
from google.colab import files
uploaded = files.upload()
```

5.

```
import numpy as np
```

```
fuel_efficiency = np.array([22, 25, 28, 30])
```

```
average_efficiency = np.mean(fuel_efficiency)
```

```
percentage_improvement = ((fuel_efficiency[3] - fuel_efficiency[0]) / fuel_efficiency[0]) *  
100
```

```
print("Average Fuel Efficiency:", round(average_efficiency, 2), "mpg")
```

```
print("Percentage Improvement in Fuel Efficiency:", round(percentage_improvement, 2),  
"%")
```

OUTPUT

```
average_efficiency = np.mean(fuel_efficiency)  
  
percentage_improvement = ((fuel_efficiency[3] - fuel_efficiency[0]) / fuel_efficiency[0]) *  
100  
  
print("Average Fuel Efficiency:", round(average_efficiency, 2), "mpg")  
print("Percentage Improvement in Fuel Efficiency:", round(percentage_improvement, 2), "%")
```

▼ ... Average Fuel Efficiency: 26.25 mpg
Percentage Improvement in Fuel Efficiency: 36.36 %