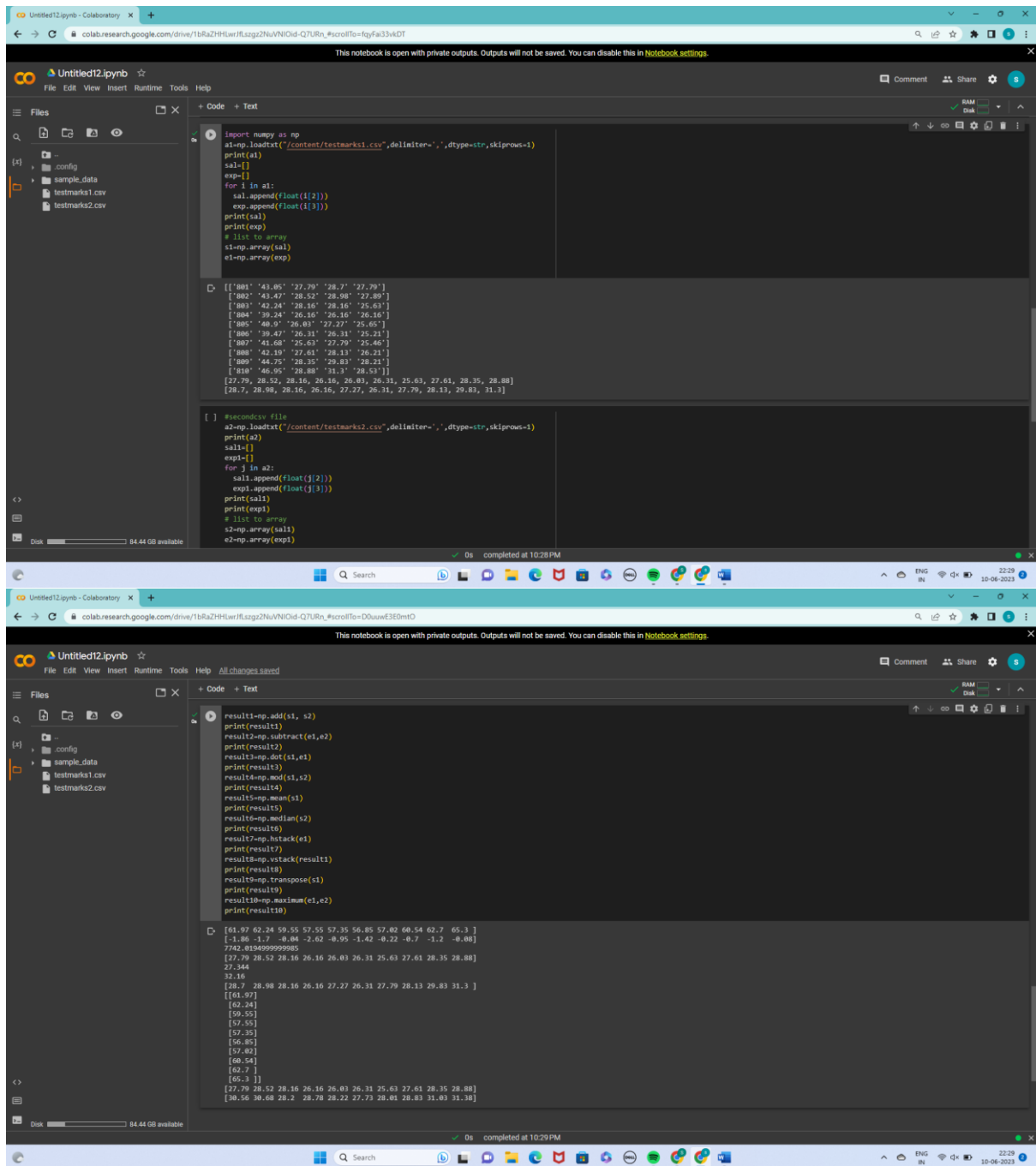


Name – Sai Suresh Gulve
Roll No. -516



The image displays two screenshots of a Google Colab notebook interface. The top screenshot shows the initial setup where two CSV files, 'testmarks1.csv' and 'testmarks2.csv', are loaded into NumPy arrays. The bottom screenshot shows the same notebook after performing various mathematical operations on the loaded data, including addition, subtraction, dot product, modulo, mean, median, vstack, transpose, and maximum calculations, with the results printed to the console.

Top Screenshot Code:

```
import numpy as np
a1=np.loadtxt("/content/testmarks1.csv",delimiter=',',dtype=str,skiprows=1)
print(a1)
sal=[]
exp=[]
for i in a1:
    sal.append(float(i[2]))
    exp.append(float(i[3]))
print(sal)
print(exp)
# list to array
s1=np.array(sal)
e1=np.array(exp)
```

Top Screenshot Output:

```
[[['801' '43.45' '27.79' '28.7' '27.79']
  ['802' '43.47' '28.52' '28.98' '27.89']
  ['803' '42.24' '28.16' '28.16' '25.63']
  ['804' '39.24' '26.16' '26.16' '26.16']
  ['805' '48.9' '26.83' '27.27' '25.65']
  ['806' '39.47' '26.31' '26.31' '25.21']
  ['807' '41.68' '25.63' '27.79' '25.46']
  ['808' '42.19' '27.61' '28.13' '26.21']
  ['809' '44.75' '28.35' '29.83' '28.21']
  ['810' '46.95' '28.88' '31.3' '28.63']]
[27.79, 28.52, 28.16, 26.16, 26.83, 26.31, 25.63, 27.61, 28.35, 28.88]
[28.7, 28.98, 28.16, 26.16, 27.27, 26.31, 27.79, 28.13, 29.83, 31.3]]
```

Bottom Screenshot Code:

```
#second csv file
a2=np.loadtxt("/content/testmarks2.csv",delimiter=',',dtype=str,skiprows=1)
print(a2)
sal1=[]
exp1=[]
for j in a2:
    sal1.append(float(j[2]))
    exp1.append(float(j[3]))
print(sal1)
print(exp1)
# list to array
s2=np.array(sal1)
e2=np.array(exp1)
```

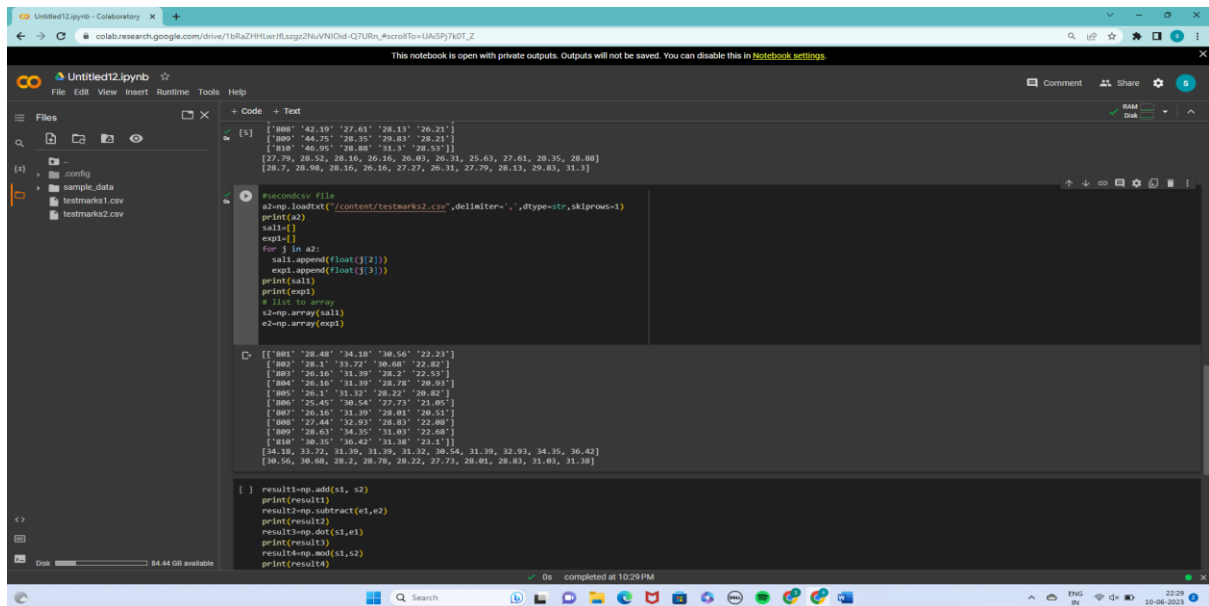
Bottom Screenshot Output:

```
result1=np.add(s1, s2)
print(result1)
result2=np.subtract(e1,e2)
print(result2)
result3=np.dot(s1,e1)
print(result3)
result4=np.mod(s1,s2)
print(result4)
result5=np.mean(s1)
print(result5)
result6=np.median(s2)
print(result6)
result7=np.hstack(e1)
print(result7)
result8=np.vstack(result1)
print(result8)
result9=np.transpose(s1)
print(result9)
result10=np.maximum(e1,e2)
print(result10)
```

Bottom Screenshot Output:

```
[61.97 62.24 59.55 57.35 57.35 56.85 57.02 60.54 62.7 65.3 ]
[-1.86 -1.7 -0.84 -2.62 -0.95 -1.42 -0.22 -0.7 -1.2 -0.88]
7142.4834099999995
[27.79 28.52 28.16 26.16 26.83 26.31 25.63 27.61 28.35 28.88]
27.344
32.16
[28.7 28.98 28.16 26.16 27.27 26.31 27.79 28.13 29.83 31.3 ]
[[61.97]
 [62.24]
 [59.55]
 [57.35]
 [57.35]
 [56.85]
 [57.42]
 [60.54]
 [62.7 ]
 [65.3 ]]
[27.79 28.52 28.16 26.16 26.83 26.31 25.63 27.61 28.35 28.88]
[30.56 30.68 28.2 28.78 28.22 27.72 28.61 28.83 31.83 31.38]
```

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```
import pandas as pd
import numpy as np

# Load the CSV file
df = pd.read_csv('content/testmarks2.csv', delimiter=',', dtype=str, skiprows=1)

# Print the DataFrame
print(df)

# Convert the DataFrame to a NumPy array
arr = df.to_numpy()

# Perform operations on the array
# 1. Add the 'math' and 'science' columns
result1 = arr[:, 2].astype(float) + arr[:, 3].astype(float)

# 2. Subtract the 'english' column from the 'math' column
result2 = arr[:, 2].astype(float) - arr[:, 4].astype(float)

# 3. Multiply the 'math' column by 2
result3 = arr[:, 2].astype(float) * 2

# 4. Divide the 'science' column by 2
result4 = arr[:, 3].astype(float) / 2

# Print the results
print(result1)
print(result2)
print(result3)
print(result4)
```

Output:

```
[[[001, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [002, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [003, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [004, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [005, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [006, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [007, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [008, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [009, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [010, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']]]

[[001, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [002, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [003, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [004, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [005, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [006, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [007, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [008, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [009, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [010, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']]

[[001, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [002, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [003, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
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  [007, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [008, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
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[[001, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [002, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [003, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [004, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [005, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [006, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [007, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [008, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [009, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']
  [010, 'Sai Suresh Gulve', '88.5', '92.1', '78.9']]
```