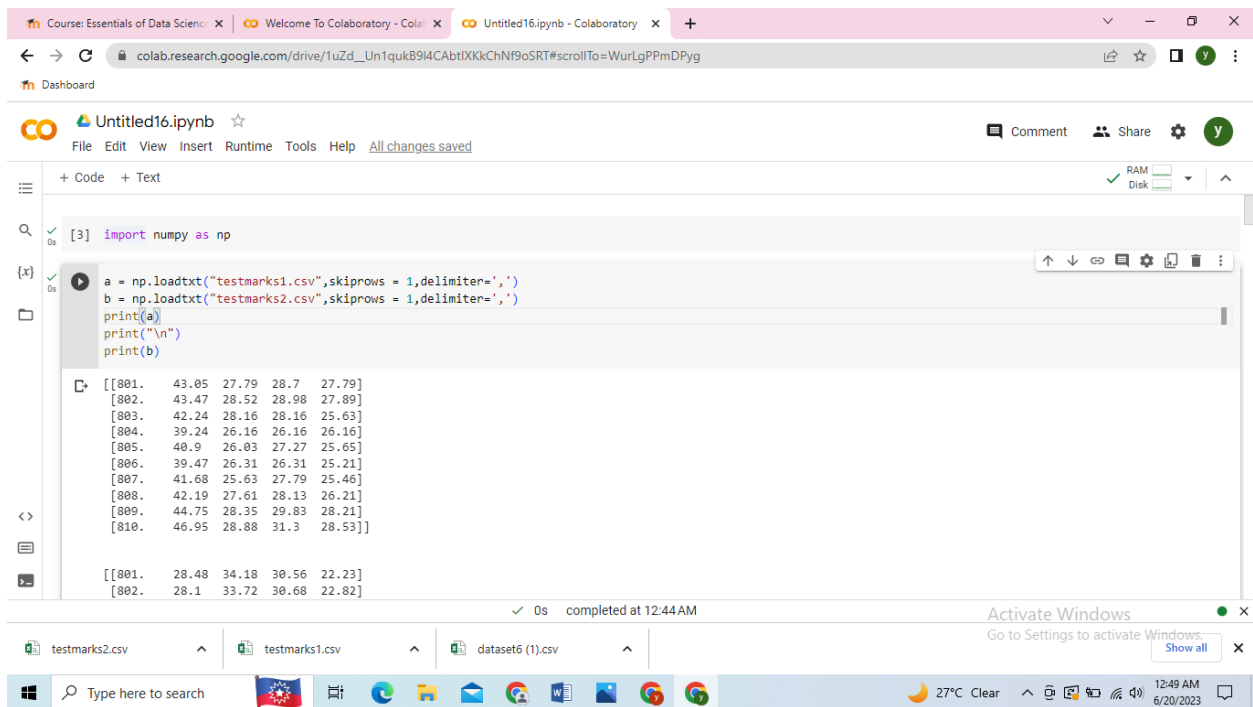


NAME :YASH KANNAWAR

ROLL NO: 324

DIV :C2



The screenshot displays a Google Colab notebook titled 'Untitled16.ipynb'. The interface includes a top navigation bar with tabs for 'Course: Essentials of Data Science', 'Welcome To Colaboratory - Colab', and 'Untitled16.ipynb - Colaboratory'. The main workspace shows a Jupyter notebook with the following code and output:

```
[3] import numpy as np
```

```
a = np.loadtxt("testmarks1.csv",skiprows = 1,delimiter=',')
b = np.loadtxt("testmarks2.csv",skiprows = 1,delimiter=',')
print(a)
print("\n")
print(b)
```

The output for `print(a)` is a 10x5 array of test scores:

[001.]	43.05	27.79	28.7	27.79]
[002.]	43.47	28.52	28.98	27.89]
[003.]	42.24	28.16	28.16	25.63]
[004.]	39.24	26.16	26.16	26.16]
[005.]	40.9	26.03	27.27	25.65]
[006.]	39.47	26.31	26.31	25.21]
[007.]	41.68	25.63	27.79	25.46]
[008.]	42.19	27.61	28.13	26.21]
[009.]	44.75	28.35	29.83	28.21]
[010.]	46.95	28.88	31.3	28.53]

The output for `print(b)` is a 2x5 array of test scores:

[001.]	28.48	34.18	30.56	22.23]
[002.]	28.1	33.72	30.68	22.82]

The bottom of the screen shows a Windows taskbar with the search bar, task view button, and several application icons. The system tray indicates the temperature is 27°C, the weather is clear, and the time is 12:49 AM on 6/20/2023. An 'Activate Windows' watermark is visible in the bottom right corner.

Course: Essentials of Data Science x Welcome To Colaboratory - Colab x Untitled16.ipynb - Colaboratory x +

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Dashboard

### Untitled16.ipynb

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```
[0]: [[001. 28.48 34.18 30.56 22.23]
[002. 28.1 33.72 30.68 22.82]
[003. 26.16 31.39 28.2 22.53]
[004. 26.16 31.39 28.78 20.93]
[005. 26.1 31.32 28.22 20.82]
[006. 25.45 30.54 27.73 21.05]
[007. 26.16 31.39 28.01 20.51]
[008. 27.44 32.93 28.83 22.08]
[009. 28.63 34.35 31.03 22.68]
[010. 30.35 36.42 31.38 23.1 ]]
```

```
[5]: add = np.add(a,b)
print("Sum of the two marksheets is \n\n",add)
```

Sum of the two marksheets is

```
[[1602. 71.53 61.97 59.26 50.02]
[1604. 71.57 62.24 59.66 50.71]
[1606. 68.4 59.55 56.36 48.16]
[1608. 65.4 57.55 54.94 47.09]
[1610. 67. 57.35 55.49 46.47]
[1612. 64.92 56.85 54.04 46.26]
[1614. 67.84 57.02 55.8 45.97]
[1616. 69.63 60.54 56.96 48.29]]
```

0s completed at 12:44 AM

testmarks2.csv testmarks1.csv dataset6 (1).csv

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Course: Essentials of Data Science x Welcome To Colaboratory - Colab x Untitled16.ipynb - Colaboratory x +

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### Untitled16.ipynb

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```
[5]: [[1614. 67.84 57.02 55.8 45.97]
[1616. 69.63 60.54 56.96 48.29]
[1618. 73.38 62.7 60.86 50.89]
[1620. 77.3 65.3 62.68 51.63]]
```

```
subs = np.subtract(a,b)
print("Substraction of the two marksheets is \n\n ",subs)
```

Substraction of the two marksheets is

```
[[ 0. 14.57 -6.39 -1.86 5.56]
[ 0. 15.37 -5.2 -1.7 5.07]
[ 0. 16.08 -3.23 -0.04 3.1 ]
[ 0. 13.08 -5.23 -2.62 5.23]
[ 0. 14.8 -5.29 -0.95 4.83]
[ 0. 14.02 -4.23 -1.42 4.16]
[ 0. 15.52 -5.76 -0.22 4.95]
[ 0. 14.75 -5.32 -0.7 4.13]
[ 0. 16.12 -6. -1.2 5.53]
[ 0. 16.6 -7.54 -0.08 5.43]]
```

```
[7]: multi = np.multiply(a,b)
print("Multiplication of the two marksheets is \n\n",multi)
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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Course: Essentials of Data Science x Welcome To Colaboratory - Colab x Untitled16.ipynb - Colaboratory x +

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Dashboard

Untitled16.ipynb ☆

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```
[7] multi = np.multiply(a,b)
    print("Multiplication of the two marksheets is \n\n",multi)

Multiplication of the two marksheets is

[[6.4160100e+05 1.2260640e+03 9.4986220e+02 8.7707200e+02 6.1777170e+02]
 [6.4320400e+05 1.2215070e+03 9.6169440e+02 8.8910640e+02 6.3644980e+02]
 [6.4480900e+05 1.1049984e+03 8.8394240e+02 7.9411200e+02 5.7744390e+02]
 [6.4641600e+05 1.0265184e+03 8.2116240e+02 7.5288480e+02 5.4752880e+02]
 [6.4802500e+05 1.0674900e+03 8.1525960e+02 7.6955940e+02 5.3403300e+02]
 [6.4963600e+05 1.0045115e+03 8.0350740e+02 7.2957630e+02 5.3067050e+02]
 [6.5124900e+05 1.0903488e+03 8.0452570e+02 7.7839790e+02 5.2218460e+02]
 [6.5286400e+05 1.1576936e+03 9.0919730e+02 8.1098790e+02 5.7871680e+02]
 [6.5448100e+05 1.2811925e+03 9.7382250e+02 9.2562490e+02 6.3980280e+02]
 [6.5610000e+05 1.4249325e+03 1.0518096e+03 9.8219400e+02 6.5904300e+02]]

div = np.divide(a,b)
    print("Division of the two marksheets is\n\n",div)

Division of the two marksheets is

[[1.      1.51158708 0.81304857 0.93913613 1.25011246]
 [1.      1.54697509 0.84578885 0.94458931 1.22217353]
 [1.      1.6146789  0.89710099 0.99858156 1.13759432]
 [1.      1.5      0.83338043 0.90896456 1.24988055]
 [1.      1.56704981 0.83109834 0.96633593 1.23198847]
 [1.      1.55088409 0.86149312 0.94879192 1.1976247 ]
 [1.      1.59327217 0.81650207 0.99214566 1.24134569]
 [1.      1.53753644 0.83844519 0.97571974 1.1870471 ]
 [1.      1.56304576 0.82532751 0.96132775 1.24382716]
 [1.      1.54695222 0.7929709  0.99745061 1.23506494]]
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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Course: Essentials of Data Science x Welcome To Colaboratory - Colab x Untitled16.ipynb - Colaboratory x +

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Dashboard

Untitled16.ipynb ☆

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```
[7] [6.5124900e+05 1.0903488e+03 8.0452570e+02 7.7839790e+02 5.2218460e+02]
    [6.5286400e+05 1.1576936e+03 9.0919730e+02 8.1098790e+02 5.7871680e+02]
    [6.5448100e+05 1.2811925e+03 9.7382250e+02 9.2562490e+02 6.3980280e+02]
    [6.5610000e+05 1.4249325e+03 1.0518096e+03 9.8219400e+02 6.5904300e+02]]

div = np.divide(a,b)
    print("Division of the two marksheets is\n\n",div)

Division of the two marksheets is

[[1.      1.51158708 0.81304857 0.93913613 1.25011246]
 [1.      1.54697509 0.84578885 0.94458931 1.22217353]
 [1.      1.6146789  0.89710099 0.99858156 1.13759432]
 [1.      1.5      0.83338043 0.90896456 1.24988055]
 [1.      1.56704981 0.83109834 0.96633593 1.23198847]
 [1.      1.55088409 0.86149312 0.94879192 1.1976247 ]
 [1.      1.59327217 0.81650207 0.99214566 1.24134569]
 [1.      1.53753644 0.83844519 0.97571974 1.1870471 ]
 [1.      1.56304576 0.82532751 0.96132775 1.24382716]
 [1.      1.54695222 0.7929709  0.99745061 1.23506494]]

[9] mean = np.mean(a)
    print("Mean of the testsheet1 is",mean,"\n\n")
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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### Untitled16.ipynb

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```
[8] [1. 1.59327217 0.81650207 0.99214566 1.24134569]
[1. 1.53753644 0.83844519 0.9751974 1.1870471 ]
[1. 1.56304576 0.82532751 0.96132775 1.24382716]
[1. 1.54695222 0.7929709 0.99745061 1.23506494]]

mean = np.mean(a)
print("Mean of the testsheet1 is",mean,"\n\n")
mean2 = np.mean(b)
print("Mean of the testsheet2 is",mean2,"\n\n")

Mean of the testsheet1 is 186.03499999999997

Mean of the testsheet2 is 183.35659999999996

[10] power = a**2
print(power)
power2 = np.square(a)
print(power2)

[[6.4160100e+05 1.8533025e+03 7.7228410e+02 8.2369000e+02 7.7228410e+02]
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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### Untitled16.ipynb

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```
power = a**2
print(power)
power2 = np.square(a)
print(power2)

[[6.4160100e+05 1.8533025e+03 7.7228410e+02 8.2369000e+02 7.7228410e+02]
[6.4320400e+05 1.8896409e+03 8.1339040e+02 8.3984040e+02 7.7785210e+02]
[6.4480900e+05 1.7842176e+03 7.9298560e+02 7.9298560e+02 6.5689690e+02]
[6.4641600e+05 1.5397776e+03 6.8434560e+02 6.8434560e+02 6.8434560e+02]
[6.4802500e+05 1.6728100e+03 6.7756090e+02 7.4365290e+02 6.5792250e+02]
[6.4963600e+05 1.5578809e+03 6.9221610e+02 6.9221610e+02 6.3554410e+02]
[6.5124900e+05 1.7372224e+03 6.5689690e+02 7.7228410e+02 6.4821160e+02]
[6.5286400e+05 1.7799961e+03 7.6231210e+02 7.9129690e+02 6.8696410e+02]
[6.5448100e+05 2.0025625e+03 8.0372250e+02 8.8982890e+02 7.9580410e+02]
[6.5610000e+05 2.2043025e+03 8.3405440e+02 9.7969000e+02 8.1396090e+02]]
[[6.4160100e+05 1.8533025e+03 7.7228410e+02 8.2369000e+02 7.7228410e+02]
[6.4320400e+05 1.8896409e+03 8.1339040e+02 8.3984040e+02 7.7785210e+02]
[6.4480900e+05 1.7842176e+03 7.9298560e+02 7.9298560e+02 6.5689690e+02]
[6.4641600e+05 1.5397776e+03 6.8434560e+02 6.8434560e+02 6.8434560e+02]
[6.4802500e+05 1.6728100e+03 6.7756090e+02 7.4365290e+02 6.5792250e+02]
[6.4963600e+05 1.5578809e+03 6.9221610e+02 6.9221610e+02 6.3554410e+02]
[6.5124900e+05 1.7372224e+03 6.5689690e+02 7.7228410e+02 6.4821160e+02]
[6.5286400e+05 1.7799961e+03 7.6231210e+02 7.9129690e+02 6.8696410e+02]
[6.5448100e+05 2.0025625e+03 8.0372250e+02 8.8982890e+02 7.9580410e+02]
[6.5610000e+05 2.2043025e+03 8.3405440e+02 9.7969000e+02 8.1396090e+02]]
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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### Untitled16.ipynb

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```
[[6.4160100e+05 1.8533025e+03 7.7228410e+02 8.2369000e+02 7.7228410e+02]
[6.4320400e+05 1.8896409e+03 8.1339040e+02 8.3984040e+02 7.7785210e+02]
[6.4480900e+05 1.7842176e+03 7.9298560e+02 7.9298560e+02 6.5689690e+02]
[6.4641600e+05 1.5397776e+03 6.8434560e+02 6.8434560e+02 6.8434560e+02]
[6.4802500e+05 1.6728100e+03 6.7756090e+02 7.4365290e+02 6.5792250e+02]
[6.4963600e+05 1.5578809e+03 6.9221610e+02 6.9221610e+02 6.3554410e+02]
[6.5124900e+05 1.7372224e+03 6.5689690e+02 7.7228410e+02 6.4821160e+02]
[6.5286400e+05 1.7799961e+03 7.6231210e+02 7.9129690e+02 6.8696410e+02]
[6.5448100e+05 2.0025625e+03 8.0372250e+02 8.8982890e+02 7.9580410e+02]
[6.5610000e+05 2.2043025e+03 8.3405440e+02 9.7969000e+02 8.1396090e+02]]

[11] transpose = a.T
print(transpose)

[[801. 802. 803. 804. 805. 806. 807. 808. 809. 810. ]
 [ 43.05 43.47 42.24 39.24 40.9 39.47 41.68 42.19 44.75 46.95]
 [ 27.79 28.52 28.16 26.16 26.03 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 ]
 [ 27.79 27.89 25.63 26.16 25.65 25.21 25.46 26.21 28.21 28.53]]

[12] horizontal_stack = np.hstack((a,b))
print(horizontal_stack,"Horizontal stack \n\n ")
vertical_stack = np.vstack((a,b))
print(vertical_stack,"vertical stack \n\n ")

0s completed at 12:44 AM
```

testmarks2.csv testmarks1.csv dataset6 (1).csv

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### Untitled16.ipynb

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```
[11] [[ 28.7 28.98 28.16 26.16 27.27 26.31 27.79 28.13 29.83 31.3 ]
      [ 27.79 27.89 25.63 26.16 25.65 25.21 25.46 26.21 28.21 28.53]]

[12] horizontal_stack = np.hstack((a,b))
print(horizontal_stack,"Horizontal stack \n\n ")
vertical_stack = np.vstack((a,b))
print(vertical_stack,"vertical stack \n\n ")

[[801. 43.05 27.79 28.7 27.79 801. 28.48 34.18 30.56 22.23]
 [802. 43.47 28.52 28.98 27.89 802. 28.1 33.72 30.68 22.82]
 [803. 42.24 28.16 28.16 25.63 803. 26.16 31.39 28.2 22.53]
 [804. 39.24 26.16 26.16 26.16 804. 26.16 31.39 28.78 20.93]
 [805. 40.9 26.03 27.27 25.65 805. 26.1 31.32 28.22 20.82]
 [806. 39.47 26.31 26.31 25.21 806. 25.45 30.54 27.73 21.05]
 [807. 41.68 25.63 27.79 25.46 807. 26.16 31.39 28.01 20.51]
 [808. 42.19 27.61 28.13 26.21 808. 27.44 32.93 28.83 22.08]
 [809. 44.75 28.35 29.83 28.21 809. 28.63 34.35 31.03 22.68]
 [810. 46.95 28.88 31.3 28.53 810. 30.35 36.42 31.38 23.1 ]] Horizontal stack

[[801. 43.05 27.79 28.7 27.79]
 [802. 43.47 28.52 28.98 27.89]
 [803. 42.24 28.16 28.16 25.63]]

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```

testmarks2.csv testmarks1.csv dataset6 (1).csv

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### Untitled16.ipynb

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```
[[801., 43.85, 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, 28.53]
[801., 28.48, 34.18, 30.56, 22.23]
[802., 28.1, 33.72, 30.68, 22.82]
[803., 26.16, 31.39, 28.2, 22.53]
[804., 26.16, 31.39, 28.78, 20.93]
[805., 26.1, 31.32, 28.22, 20.82]
[806., 25.45, 30.54, 27.73, 21.05]
[807., 26.16, 31.39, 28.01, 20.51]
[808., 27.44, 32.93, 28.83, 22.08]
[809., 28.63, 34.35, 31.03, 22.68]
[810., 30.35, 36.42, 31.38, 23.1]] vertical stack
```

```
[13] custom_sequence = np.arange(69,420,96)
print(custom_sequence)
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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Dashboard

### Untitled16.ipynb

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```
[13] custom_sequence = np.arange(69,420,96)
print(custom_sequence)

[ 69 165 261 357]
```

```
[14] std_deviation = np.std(a)
print(std_deviation)

309.7929965912722
```

```
minimum = np.min(a)
maximum = np.max(a)
print(minimum, "\n\n", maximum)

25.21

810.0
```

```
[16] copy_array = a.copy()
print(copy_array)
```

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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Dashboard

### Untitled16.ipynb

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✓ [16] print(copy\_array)

```
[[801. 43.05 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. 40.9 26.03 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 28.53]]
```

✓ #search  
index = np.where(a == 42.19)  
print(index)  
print(type(index))

<> (array([7]), array([1]))  
<class 'tuple'>

✓ 0s completed at 12:44 AM

testmarks2.csv testmarks1.csv dataset6 (1).csv

Activate Windows  
Go to Settings to activate Windows. Show all

Type here to search

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✓ #sort  
sorted\_data = np.sort(a)  
print(sorted\_data)

```
[[ 27.79 27.79 28.7 43.05 801. ]
 [ 27.89 28.52 28.98 43.47 802. ]
 [ 25.63 28.16 28.16 42.24 803. ]
 [ 26.16 26.16 26.16 39.24 804. ]
 [ 25.65 26.03 27.27 40.9 805. ]
 [ 25.21 26.31 26.31 39.47 806. ]
 [ 25.46 25.63 27.79 41.68 807. ]
 [ 26.21 27.61 28.13 42.19 808. ]
 [ 28.21 28.35 29.83 44.75 809. ]
 [ 28.53 28.88 31.3 46.95 810. ]]
```

✓ [19] broadcasting, counts = np.unique(a[:,1], return\_counts=True)  
print(broadcasting)

<> [39.24 39.47 40.9 41.68 42.19 42.24 43.05 43.47 44.75 46.95]

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testmarks2.csv testmarks1.csv dataset6 (1).csv

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✓ 0s [39.24 39.47 40.9 41.68 42.19 42.24 43.05 43.47 44.75 46.95]

modarray = np.mod(a,b)  
print(modarray)

[[ 0. 14.57 27.79 28.7 5.56]  
[ 0. 15.37 28.52 28.98 5.07]  
[ 0. 16.08 28.16 28.16 3.1 ]  
[ 0. 13.08 26.16 26.16 5.23]  
[ 0. 14.8 26.03 27.27 4.83]  
[ 0. 14.02 26.31 26.31 4.16]  
[ 0. 15.52 25.63 27.79 4.95]  
[ 0. 14.75 27.61 28.13 4.13]  
[ 0. 16.12 28.35 29.83 5.53]  
[ 0. 16.6 28.88 31.3 5.43]]

[21] shape = a.shape  
print(shape)

(10, 5)

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✓ 0s [21] shape = a.shape  
print(shape)

(10, 5)

✓ 0s [23] print("Original \n",a,"\n\n")  
reshape = a.reshape(5,10)  
print("Reshaped \n",reshape)

Original  
[[801. 43.05 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. 40.9 26.03 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 28.53]]

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```
print(reshaped_array.shape)

Original
[[801.  43.05  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.  40.9  26.03  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  28.53]]

Reshaped
[[801.  43.05  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.  40.9  26.03  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  28.53]]
```

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