Name : pratham nanne

RollNO : 245

DIV- B3

PRN-: 202201030005

```
import numpy as np

# Load the datasets into arrays
data1 = np.genfromtxt('testmarks1.csv', delimiter='\t',
skip_header=1) data2 = np.genfromtxt('testmarks2.csv',
delimiter='\t', skip_header=1)

# Matrix Operations
# Addition
matrix_sum = data1 + data2

# Subtraction
matrix_diff = data1 - data2

# Multiplication
matrix_product = np.matmul(data1[:, 1:], data2[:, 1:].T)

# Transpose
matrix_transpose = data1.T

# Horizontal and Vertical Stacking
horizontal_stack = np.hstack((data1, data2))
vertical_stack = np.vstack((data1, data2))

# Custom Sequence Generation
custom_sequence = np.arange(10, 51, 10)
# Arithmetic and Statistical Operations
# Mean
mean = np.mean(data1)

# Standard Deviation
std_dev = np.std(data1)
```

```
# Minimum
minimum = np.min(data1)

# Maximum
maximum = np.max(data1)

# Mathematical Operations
# Square Root
sqrt = np.sqrt(data1)

# Exponential
exp = np.exp(data1)

# Bitwise Operators
bitwise_and = np.bitwise_and(data1.astype(int),
data2.astype(int)) bitwise_or = np.bitwise_or(data1.astype(int),
data2.astype(int))

# Copying and Viewing Arrays
copy_array = data1.copy()
view_array = data1.view()

# Data Stacking
data_stack = np.column_stack((data1, data2))
# Searching
index = np.where(data1 == 40.9)

# Sorting
sorted_data = np.sort(data1, axis=0)

# Counting
unique_values, counts = np.unique(data1[:, 1], return_counts=True)

# Broadcasting
broadcasted_array = data1 + 10
```

```
# Displaying the results
print("Matrix Sum:")
print(matrix_sum)
print("\nMatrix Difference:")
print(matrix_diff)
print("\nMatrix Product:")
print(matrix_product)
print("\nMatrix Transpose:")
print(matrix_transpose)
print("\nHorizontal Stack:")
print(horizontal_stack)
print("\nVertical Stack:")
print(vertical_stack)
print("\nCustom Sequence:")
print(custom_sequence)
print("\nMean:")
print(mean)
print("\nStandard Deviation:")
print(std_dev)
print("\nMinimum:")
print(minimum)
print("\nMaximum:")
print(maximum)
print("\nSquare Root:")
print(sqrt)
print("\nExponential:")
print(exp)
print("\nBitwise AND:")
print(bitwise_and)
print("\nBitwise OR:")
print(bitwise_or)
print("\nCopied Array:")
print(copy_array)
print("\nView Array:")
print(view_array)
print("\nData Stack:")
```

```
print(data_stack)

print("\nIndex of 40.9 in data1:")

print(index)

print("\nSorted Data:")

print(sorted_data)

print("\nUnique Values and Counts:")

print(unique_values, counts)

print("\nBroadcasted Array:")

print(broadcasted_array)
```

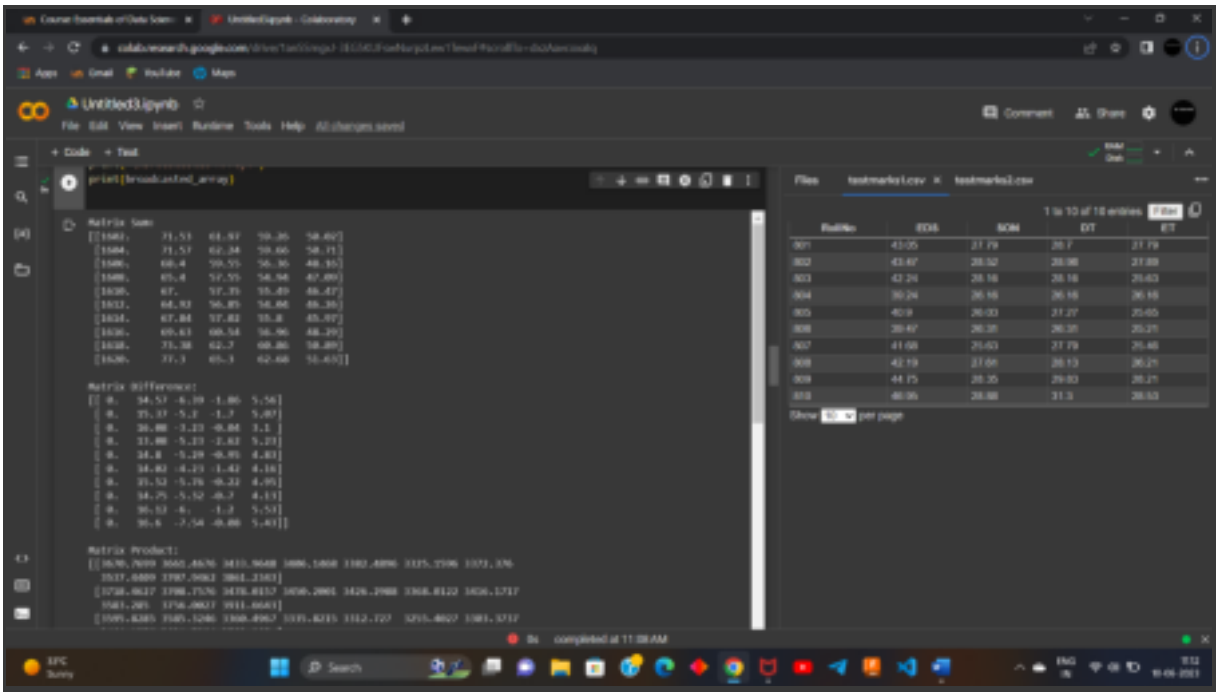
Output:

```
Matrix Sum:
[[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]
  [1618. 73.38 62.7 60.86 50.89]
  [1620. 77.3 65.3 62.68 51.63]]

Matrix Difference:
 [[ 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]]

Matrix Product:
 [[3670.7699 3661.4676 3433.9648 3406.1468 3382.4896 3325.1596
3372.376  3537.4409 3707.9462 3861.2343]
  [3718.4627 3708.7576 3478.0157 3450.2001 3426.2988 3368.0122
3416.1717  3583.285 3756.0027 3911.6643]
  [3595.8285 3585.3246 3360.4967 3335.8215 3312.727 3255.4027 3303.3737
3464.1376 3631.7204 3783.285 ]
  [3392.6904 3384.3192 3174.7776 3148.0944 3126.3816 3073.6692
3116.964  3270. 3427.0908 3568.878 ]
  [3458.1081 3448.9982 3233.9342 3208.7108 3186.342 3131.9908 3176.9399
3332.01 3493.0276 3637.5752]
  [3387.8333 3378.7632 3168.3294 3143.2532 3121.5366 3068.2657
3112.4063  3264.5992 3421.9367 3564.0835]
  [3478.318 3469.046 3252.1663 3227.5485 3204.8906 3150.0459 3195.457
3351.0376 3513.4454 3658.6088]
  [3587.5821 3577.6888 3354.1456 3328.525 3305.425 3248.7103 3295.8567
3456.5956 3623.6199 3774.1931]
  [3782.1961 3772.3736 3537.3438 3509.5092 3485.0318 3425.7029
3474.6919  3644.3812 3820.4427 3978.3859]
  [3915.0043 3904.4672 3660.1961 3632.7021 3607.1972 3545.3782
3596.6185  3771.6478 3954.5059 4117.9791]]

Matrix 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]]

Horizontal Stack:
[[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  ]]

Vertical 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]
 [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]
 [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 ]]

Custom Sequence:
[10 20 30 40 50]

Mean:
186.03499999999997

Standard Deviation:
309.7929965912722

Minimum:
25.21

Maximum:
810.0

Square Root:
[[28.3019434  6.56124988  5.27162214  5.35723809  5.27162214]
 [28.31960452  6.59317829  5.34041197  5.38330753  5.28109837]
 [28.33725463 6.49923072 5.30659966 5.30659966 5.06260802]
 [28.35489376  6.26418391  5.11468474  5.11468474  5.11468474]
 [28.37252192  6.39531078  5.10196041  5.22206856  5.0645829  ]
 [28.39013913  6.28251542  5.12932744  5.12932744  5.02095608]
 [28.40774542  6.45600496  5.06260802  5.27162214  5.04579032]
 [28.42534081  6.49538298  5.25452186  5.30377224  5.11957029]
 [28.44292531  6.68954408  5.3244718  5.46168472  5.31130869]
 [28.46049894 6.85200701 5.37401154 5.59464029 5.34134814]]
```

```
Exponential:
[[ inf 4.97024098e+18 1.17231319e+12 2.91240408e+12
1.17231319e+12]
 [ inf 7.56451570e+18 2.43264437e+12 3.85348866e+12
1.29560645e+12]
 [ inf 2.21105179e+18 1.69719839e+12 1.69719839e+12
1.35197161e+11]
 [ inf 1.10081787e+17 2.29690824e+11 2.29690824e+11
2.29690824e+11]
 [ inf 5.78954335e+17 2.01690463e+11 6.96964281e+11
1.37928325e+11]
 [ inf 1.38548938e+17 2.66862665e+11 2.66862665e+11
8.88308645e+10]
 [ inf 1.26297282e+18 1.35197161e+11 1.17231319e+12
1.14061088e+11]
 [ inf 2.10321752e+18 9.79198288e+11 1.64703859e+12
2.41467325e+11]
 [ inf 2.72068377e+19 2.05233647e+12 9.01580262e+12
1.78421561e+12]
 [ inf 2.45542077e+20 3.48678073e+12 3.92118456e+13
2.45709285e+12]]

Bitwise AND:
[[801 8 2 28 18]
 [802 8 0 28 18]
 [803 10 28 28 16]
 [804 2 26 24 16]
 [805 8 26 24 16]
 [806 1 26 26 17]
 [807 8 25 24 16]
 [808 10 0 28 18]
 [809 12 0 29 20]
 [810 14 4 31 20]]

Bitwise OR:
[[801 63 59 30 31]
 [802 63 61 30 31]
 [803 58 31 28 31]
 [804 63 31 30 30]
 [805 58 31 31 29]
 [806 63 30 27 29]
 [807 59 31 31 29]
 [808 59 59 28 30]
 [809 60 62 31 30]
 [810 62 60 31 31]]

Copied 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]]

View 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]]

Data Stack:
 [[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  ]]

Index of 40.9 in data1:
 (array([4]), array([1]))

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

Unique Values and Counts:
 [39.24 39.47 40.9 41.68 42.19 42.24 43.05 43.47 44.75 46.95] [1 1 1 1
1 1 1 1 1 1]

Broadcasted Array:
 [[811. 53.05 37.79 38.7 37.79]
 [812. 53.47 38.52 38.98 37.89]
 [813. 52.24 38.16 38.16 35.63]
 [814. 49.24 36.16 36.16 36.16]
 [815. 50.9 36.03 37.27 35.65]
 [816. 49.47 36.31 36.31 35.21]
 [817. 51.68 35.63 37.79 35.46]
 [818. 52.19 37.61 38.13 36.21]
 [819. 54.75 38.35 39.83 38.21]
 [820. 56.95 38.88 41.3 38.53]]
```




| RollNo | EC45 | SOM | DT | ET |
|---|---|---|---|---|
| 801 | 43:05 | 27.79 | 20.7 | 27.79 |
| 802 | 43:47 | 28.32 | 28.98 | 21.89 |
| 803 | 42:24 | 28.16 | 28.16 | 25:43 |
| 804 | 30:24 | 26:16 | 26:16 | 26:16 |
| 805 | 40:9 | 26:03 | 27.27 | 25:05 |
| 806 | 30:47 | 26:35 | 26:35 | 25:21 |
| 807 | 41:08 | 25:43 | 27.79 | 25:46 |
| 808 | 42:19 | 27:01 | 26:13 | 26:21 |
| 809 | 44:15 | 28:35 | 29:03 | 26:21 |
| 810 | 46:06 | 28.88 | 31.3 | 28:53 |