In [1]:

```
import numpy as np

# Get user input for tensor dimensions
rows = int(input("Enter number of rows: "))
cols = int(input("Enter number of columns: "))

# Create an empty tensor with the specified dimensions
tensor = np.empty((rows, cols))

for i in range(rows):
    for j in range(cols):
        tensor[i][j] = float(input(f"Enter value for [{i}][{j}]: "))

print("Tensor:\n", tensor)

# Calculate the mean of the tensor
mean = np.mean(tensor)
print("Mean:", mean)

# Calculate the standard deviation of the tensor
std = np.std(tensor)
print("Standard deviation:", std)

# Calculate the variance of the tensor
var = np.var(tensor)
print("Variance:", var)

# Find the minimum and maximum values in the tensor
min_val = np.min(tensor)
max_val = np.max(tensor)
print("Minimum value:", min_val)
print("Maximum value:", max_val)

# Reshape the tensor to a 1D array
reshaped_tensor = np.reshape(tensor, (1, -1))
print("Reshaped tensor:\n", reshaped_tensor)

# Transpose the tensor
transposed_tensor = np.transpose(tensor)
print("Transposed tensor:\n", transposed_tensor)

# Perform a dot product between the tensor and its transpose
dot_product = np.dot(tensor, transposed_tensor)
print("Dot product:\n", dot_product)
```

```
Enter number of rows: 2
Enter number of columns: 2
Enter value for [0][0]: 1
Enter value for [0][1]: 2
Enter value for [1][0]: 3
Enter value for [1][1]: 4
Tensor:
 [[1. 2.]
 [3. 4.]]
Mean: 2.5
Standard deviation: 1.118033988749895
Variance: 1.25
Minimum value: 1.0
Maximum value: 4.0
Reshaped tensor:
 [[1. 2. 3. 4.]]
Transposed tensor:
 [[1. 3.]
 [2. 4.]]
Dot product:
 [[ 5. 11.]
 [11. 25.]]
```