In [8]:
```
#Reshaping 1D array into 3D

import numpy as np
#Creating single diamentional array
num1=np.array([12,13,14,15,16,98,76,56,34,54,55,22,33,44,50,66,77,67,89,36])
print("Array is:",num1)

print("-----------------------------------------------------")

#Resgaping array in 11 rows and 2 col
array1=num1.reshape(5,2,2)
print(array1)
```

```
Array is: [12 13 14 15 16 98 76 56 34 54 55 22 33 44 50 66 77 67 89 36]
-----------------------------------------------------
[[[12 13]
  [14 15]]

 [[16 98]
  [76 56]]

 [[34 54]
  [55 22]]

 [[33 44]
  [50 66]]

 [[77 67]
  [89 36]]]
```

In [13]:
```
#Reshaping 2D array into 3D

import numpy as np

# Creating a 2D array with shape (4,3)
array_2d = np.array([
    [1, 2, 3],
    [4, 5, 6],
    [7, 8, 9],
    [10, 11, 12]
])

print("Original 2D array (4x3):")
print(array_2d)

# Reshaping into 3D (2 blocks, 2 rows, 3 columns)
array_3d = array_2d.reshape(2, 2, 3)

print("\nReshaped 3D array (2x2x3):")
print(array_3d)
```

```
Original 2D array (4x3):
[[ 1  2  3]
 [ 4  5  6]
 [ 7  8  9]
 [10 11 12]]

Reshaped 3D array (2x2x3):
[[[ 1  2  3]
  [ 4  5  6]]

 [[ 7  8  9]
  [10 11 12]]]
```

In [43]:

```
from collections import Counter
import numpy as np
#Creating single diamentional array
num2=np.array([12,13,14,15,16,98,76,56,34])
print("\nArray is:",num2)

#Calculate mean of the array
mean_value=np.mean(num2)
print("\nMean value is:",mean_value)

#Calculate median of the array
median_value=np.median(num2)
print("\nMedian value is:",median_value)

#Calculate mode of the array

count = Counter(num2)
mode_value = max(count, key=count.get)  # Get the element with the highest count

print("\nMode value is:", mode_value)

#Use of where
# Find indices where values > 30
indices = np.where(num2 > 30)

# Extract values using these indices
values = num2[indices]
print("\nIndices where arr > 30:",indices )
print("Values where arr > 30:", values)


#Calculation standard Deviation
std_dev=np.std(num2)
print("\nStandard Deviation is:",std_dev)

#Calculation of variance
var=np.var(num2)
print("\nVariance is:",var)

#Find index o maximum value
max_index=np.argmax(num2)
value = num2[max_index]
print("\nMax index is:",max_index)
```

```
print("Max index value is:",value)

#Find index o minimum value
min_index=np.argmin(num2)
value = num2[min_index]
print("Min index is:",min_index)
print("Min index value is:",value)
```

```
Array is: [12 13 14 15 16 98 76 56 34]

Mean value is: 37.111111111111114

Median value is: 16.0

Mode value is: 12

Indices where arr > 30: (array([5, 6, 7, 8]),)
Values where arr > 30: [98 76 56 34]

Standard Deviation is: 30.307477788106077

Variance is: 918.5432098765432

Max index is: 5
Max index value is: 98
Min index is: 0
Min index value is: 12
```

In [47]:
```
# Sorthing
import numpy as np
arr=np.array([12,13,14,15,16,98,76,56,34,54,55,22,33,44,50,66,77,67,89,36])
# Sort an array in ascending order
sorted_arr = np.sort(arr)

print("Sorted Array:", sorted_arr)

# Sorting in descending order
sorted_desc = np.sort(arr)[::-1]

print("Sorted Array (Descending):", sorted_desc)
```

```
Sorted Array: [12 13 14 15 16 22 33 34 36 44 50 54 55 56 66 67 76 77 89 98]
Sorted Array (Descending): [98 89 77 76 67 66 56 55 54 50 44 36 34 33 22 16 15 14 13
12]
```

In [49]:
```
import numpy as np
arr2=np.array([1,3,4,6,8,10])
#Find the index where 5 should be inserted to maintain sorted order
index=np.searchsorted(arr2,5)
print("index of insert 5 is:",index)
```

```
index of insert 5 is: 3
```

In [50]:
```
import numpy as np
arr3=np.array([1,3,4,6,8,10])
#Split the array into equal sizes sub arrays


```

```
sub_array=np.split(arr3,3)
print(sub_array)
```

```
[array([1, 3]), array([4, 6]), array([ 8, 10])]
```

In [54]:
```
import numpy as np

arr4 = np.array([1, 3, 4, 6, 8, 10])

# Split the array into 3 equal sub-arrays
sub_array = np.split(arr4, 3)

# Loop through and print each sub-array
for sub_arr in sub_array:
    print(sub_arr)
```

```
[1 3]
[4 6]
[ 8 10]
```

In [ ]:

In [ ]:

In [ ]: