

practical2

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```
[12]: #Practical2
      #descriptive measures
      #Mean
      import numpy as np
      import math
      #using library
      arr=np.array(eval(input()))
      print("The value of mean of array without using library is:", np.mean(arr))

      #without using library
      x=np.sum(arr)
      mean=(x/(arr.shape))
      print("The value of mean without using library is:", mean)
```

2,4,6

The value of mean of array without using library is: 4.0

The value of mean without using library is: [4.]

```
[16]: #median

      import numpy as np
      #using library
      arr1=np.array(eval(input()))
      print("The value of median of array 1 with using library is:", np.median(arr1))

      #without using library
      sorted_arr1=np.sort(arr1)
      n=len(arr1)
      if n%2==0:

          median1=sorted_arr1[n//2]
          median2=sorted_arr1[n//2 - 1]
          median=(median1+median2)/2
      else:
          median=sorted_arr1[((n+1)//2)-1]
      print("Value of median of array 2 without using library is:", median)
```

1,2,3,4,5

The value of median of array 1 with using library is: 3.0

Value of median of array 2 without using library is: 3

[18]: *#mode*

```
import numpy as np
import statistics
#using library
arr=np.array(eval(input()))
mode=statistics.mode(arr)
print("The mode of array with using library function:", mode)

#without using library
dict={}
for element in arr:
    dict[element]=0
for element in arr:
    dict[element]+=1
max=1
for k, v in dict.items():
    if v>max:
        max=v
        mode=k
if max==1:
    print("No mode")
else:
    print("The mode of array without using library is:", mode)
```

1,2,2,3,4

The mode of array with using library function: 2

The mode of array without using library is: 2

[22]: *#population variance*

```
import numpy as np
import math

#using library
arr=np.array(eval(input()))
popvar= np.var(arr)
print("The population variance of array with using library is:", popvar)
#without using library
n=len(arr)
avg=np.mean(arr)
```

```
squared_diffs = [(x - avg) ** 2 for x in arr]
var = sum(squared_diffs) / n
print("The population variance of array without using library is:", var)
```

1,2,3,4,5

The population variance of array with using library is: 2.0

The population variance of array without using library is: 2.0

```
[24]: #standard deviation
import numpy as np
import math
import statistics

#using library arr=np.array(eval(input())) stddev=np.std(arr) print("The standard
deviation of an array with using library is:", stddev)

#without using library
popvar= np.var(arr)
stdev=pow(var, 1/2)
print("The standard deviation of an array without using library is:", stdev)
```

1,2,3,4,5

The standard deviation of an array with using library is: 1.4142135623730951

The standard deviation of an array without using library is: 1.4142135623730951

```
[26]: #range
import numpy as np
import math

arr=np.array(eval(input()))
range=np.max(arr)-np.min(arr)
print("The range of array is:", range)
```

1,2,3,4,5

The range of array is: 4

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