getModeMedian

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1 Ödev 1: Mode ve Median Hesalayan Fonksiyon Karmaşılığı

[1]:
```
import random as rd
```

[2]:
```
def generate_random_list(n=5,lower_bound=0,upper_bound=10): # Karmşılığı: O(N)
    """Rasgele sayılar içeren liste üreten fonksiyon"""
    rand_list = list()
    for i in range(n):
        rand_num = rd.randint(lower_bound,upper_bound)
        rand_list.append(rand_num)
    return rand_list
```

[3]:
```
arr_1 = generate_random_list()
```

[4]:
```
arr_1
```

[4]:
```
[1, 5, 0, 0, 2]
```

[5]:
```
def getModeMedian(array): # fonksiyon karmaşılığı: O(N)+ O(N) + O(NxN) + O(1) = O(NxN)
    """Liste mode ve median hesalayan fonksiyon"""
    histogram = {}
    mode = float('-inf') # mode varsayılan değeri negatif sonsuz olur
    max_frequency = float('-inf') # max frequency  varsayılan değeri negatif sonsuz olur
    median = None
    arr_size = len(array)

    # Histogram hesaplayan kod bloku karmaşılığı : O(N)
    for num in array:
        if num in histogram:
            histogram[num] = histogram[num]+1
        else: histogram[num] = 1

    # Mode hesaplayan kod bloku karmaşılığı : O(N)
    keys = histogram.keys()
    for key in keys:
```

```
        if histogram[key] > max_frequency:
            max_frequency = histogram[key]
            mode = key

    # array listesi sıralayan (bubble sort) kod bloku karmaşılığı : O(NxN)
    for i in range(arr_size-1,-1,-1):
        for j in range(i):
            if array[j]> array[j+1]: # swap( array[j],array[j+1])
                copy = array[j]
                array[j]=array[j+1]
                array[j+1]= copy

    # Median hesaplayan kod bloku karmaşılığı : O(1)
    if arr_size%2 == 1:
        mid = (arr_size//2)+1
        median = array[mid]
    else:
        mid_1 = array[arr_size//2]
        mid_2 = array[(arr_size//2)+1]
        median = (mid_1 + mid_2)/2
    return mode,median
```

[6]:
```
arr_2 = generate_random_list(100,1,100)
```

[7]:
```
print(arr_2)
```

```
[27, 29, 52, 40, 74, 48, 59, 43, 26, 91, 24, 38, 53, 97, 51, 68, 78, 33, 35, 50,
3, 45, 22, 71, 55, 44, 55, 71, 6, 62, 100, 6, 76, 15, 84, 83, 78, 13, 52, 82,
41, 95, 16, 95, 97, 51, 1, 70, 27, 52, 26, 19, 42, 50, 64, 53, 93, 27, 38, 9,
33, 15, 58, 12, 45, 18, 15, 74, 14, 68, 61, 41, 99, 24, 57, 98, 96, 88, 31, 30,
46, 16, 75, 47, 34, 100, 68, 46, 43, 48, 93, 69, 45, 70, 44, 58, 32, 40, 94, 22]
```

[8]:
```
mode,median = getModeMedian(arr_2)
```

[9]:
```
print("mode = ",mode)
print("median = ",median)
```

```
mode =  27
median =  49.0
```