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In [1]: hem = 'hdtwrwhdsabfkjdnjsfheuhsfjjdsbjfbjvcxbzchjkasgefytywhiarhsdnfnsbmzbcXZNkfaje'
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In [7]: h =10,  
g = 6  
a =6
```

```
In [8]: # Finding the count of elements in a string without using counter function  
lis = {}  
for i in hem:  
    if i in lis:  
        lis[i] += 1  
    else:  
        lis[i] = 1  
print(lis)
```

```
{'h': 7, 'd': 6, 't': 2, 'w': 3, 'r': 3, 's': 8, 'a': 4, 'b': 6, 'f': 8, 'k': 4,  
'j': 8, 'n': 3, 'e': 4, 'u': 2, 'v': 1, 'c': 3, 'x': 1, 'z': 2, 'g': 2, 'y': 2,  
'i': 1, 'm': 1, 'X': 1, 'Z': 1, 'N': 1}
```

```
In [9]: # sort the dictionary  
mykeys = list(lis.keys())  
mykeys.sort()  
sorted_dict = {i: lis[i] for i in mykeys}  
print(sorted_dict)
```

```
{'N': 1, 'X': 1, 'Z': 1, 'a': 4, 'b': 6, 'c': 3, 'd': 6, 'e': 4, 'f': 8, 'g': 2,  
'h': 7, 'i': 1, 'j': 8, 'k': 4, 'm': 1, 'n': 3, 'r': 3, 's': 8, 't': 2, 'u': 2,  
'v': 1, 'w': 3, 'x': 1, 'y': 2, 'z': 2}
```

```
In [12]: # Finding the List of items  
sorted_dicti = sorted(lis.items(),key = lambda x:x[1], reverse = True)  
new = []  
for key,val in sorted_dicti:  
    new.append(val)  
print(new)
```

```
[8, 8, 8, 7, 6, 6, 4, 4, 4, 3, 3, 3, 3, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1]
```

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In [27]: # removing the duplicate elements  
dictinct_val = list(sorted(set(new),reverse = True))  
dictinct_val
```

```
Out[27]: [8, 7, 6, 4, 3, 2, 1]
```

```
In [29]: # Finding the second heighest element when dictionary has duplicates  
dictinct_val = list(sorted(set(new),reverse = True))  
print(dictinct_val[1])  
new_dict = []  
for key,val in sorted_dicti:  
    if val == dictinct_val[1]:  
        new_dict.append((key,val))  
print(new_dict)
```

```
7  
[('h', 7)]
```

```
In [ ]: # Finding the second heighest element when it has no duplicates  
data = {'a': 3, 'b': 5, 'c': 8, 'd': 6, 'e': 4}  
  
# Convert dictionary items into a List of tuples  
sorted_data = sorted(data.items(), key=lambda item: item[1], reverse=True)
```

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print(sorted_data)
print(sorted_data[1])
print((len(sorted_data)+1)//2)
# Get the second maximum value and its corresponding key
second_max_key, second_max_value = sorted_data[1]

# print("Second Maximum Key:", second_max_key)
# print("Second Maximum Value:", second_max_value)
sample_dict = { second_max_key : second_max_value }
print(sample_dict)

```

```

In [23]: sorted_dicti = sorted(lis.items(),key = lambda x:x[1])
print(sorted_dicti)

```

```

[('v', 1), ('x', 1), ('i', 1), ('m', 1), ('X', 1), ('Z', 1), ('N', 1), ('t', 2),
('u', 2), ('z', 2), ('g', 2), ('y', 2), ('w', 3), ('r', 3), ('n', 3), ('c', 3),
('a', 4), ('k', 4), ('e', 4), ('d', 6), ('b', 6), ('h', 7), ('s', 8), ('f', 8),
('j', 8)]

```

```

In [2]: # Using counter
from collections import Counter
collection = Counter(hem)
print(collection)

```

```

Counter({'s': 8, 'f': 8, 'j': 8, 'h': 7, 'd': 6, 'b': 6, 'a': 4, 'k': 4, 'e': 4,
'w': 3, 'r': 3, 'n': 3, 'c': 3, 't': 2, 'u': 2, 'z': 2, 'g': 2, 'y': 2, 'v': 1,
'x': 1, 'i': 1, 'm': 1, 'X': 1, 'Z': 1, 'N': 1})

```

```

In [3]: type(collection)

```

```

Out[3]: collections.Counter

```

```

In [30]: import numpy as np
import pandas as pd

```

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In [6]: # Converting Dictionary to Data Frame
#data = pd.DataFrame.from_dict(collection)
data = pd.DataFrame.from_dict(collection, orient='index').reset_index()

```

```

In [19]: data

```

Out[19]:

	index	0
0	h	7
1	d	6
2	t	2
3	w	3
4	r	3
5	s	8
6	a	4
7	b	6
8	f	8
9	k	4
10	j	8
11	n	3
12	e	4
13	u	2
14	v	1
15	c	3
16	x	1
17	z	2
18	g	2
19	y	2
20	i	1
21	m	1
22	X	1
23	Z	1
24	N	1

```
In [10]: # Printinng the 2*3 array elements b/w 2,5  
np.random.randint(2,5,(2,3))
```

```
Out[10]: array([[2, 3, 4],  
               [3, 4, 3]])
```

dict to pandas

```
In [40]: # Changing columns names  
dt = dt.rename(columns={'index': 'word', 0: 'count'})
```

```
In [41]: dt
```

Out[41]:

	word	count
0	N	1
1	X	1
2	Z	1
3	a	4
4	b	6
5	c	3
6	d	6
7	e	4
8	f	8
9	g	2
10	h	7
11	i	1
12	j	8
13	k	4
14	m	1
15	n	3
16	r	3
17	s	8
18	t	2
19	u	2
20	v	1
21	w	3
22	x	1
23	y	2
24	z	2

In [5]:

```
# find the Key with the Largest number of unique elements
dic = {'scalar':[5,7,5,4,5], 'is':[6,7,4,3,3], 'best':[9,9,6,5,5]}
max_unique_count = 0
key_with_max_unique = None
# Iterate through the dictionary
for key, values in dic.items():
    unique_count = len(set(values)) # Calculate the number of unique elements
    print(unique_count)
    if unique_count > max_unique_count:
        max_unique_count = unique_count
        key_with_max_unique = key
print("Key with the largest number of unique elements:", key_with_max_unique)
```

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Key with the largest number of unique elements: is

