In [2]:

```
# Largest number in a list
# Second largest number in a list
# Kth largest number in a list

# Element with highest frequency
# Second highest frequency
# Kth highest frequency

# Function to find the secong largest number in a list
def secondLargest(li):
    # Convert the list into a unique list
    unique = []
    for n in li:
        if n not in unique:
            unique.append(n)
#     unique.sort()
#     unique = unique[-1::-1]
    if len(unique) == 1:
        print("There is only one element in the given list")
    else:
        unique = sorted(unique, reverse=True)
        return unique[1]

# Function to find the fifth smallest number in a list
def fifthLeast(li):
    unique = []
    for i in li:
        unique.append(i)
    unique.sort()
    if len(unique)<5:
        return -1
    else:
        return li[4]

# Function to find the Kth largest number in a list
def kLargest(li,k):
    unique = []
    for i in li:
        if i not in unique:
            unique.append(i)
    unique = sorted(unique,reverse=True)
    if len(unique)<k:
        return -1
    else:
        return unique[k-1]

# Function to find the Kth smallest number in a list
def kSmallest(li,k):
    unique = []
    for i in li:
        if i not in unique:
            unique.append(i)
    unique.sort()
    if k== 0:
        return -1
    if len(unique)<k:
```

```
57          return -1
58      else:
59          return unique[k-1]
60
61
62  li=[1,6,4,3,5,9,6,1,1,5,8,9,2,3,4,6]
63  k=int(input("enter k : "))
64  secondLargest(li)
65  fifthLeast(li)
66  kLargest(li,k)
67  kSmallest(li,k)
```

```
enter k : 3
```

Out[2]:
```
3
```

In [9]:

```
# Function to identify the element with highest frequency
# highestFrequency([1,2,3,9,8,7,3,4,2,1]) -> if two elements have same highe

def highestFrequencyElement(li,k):
    unique = []
    for i in li:
        if i not in unique:
            unique.append(i)
    freq = []
    for i in unique:
        freq.append(li.count(i))
    freq = sorted(freq,reverse=True)
    unique2 = []
    for i in freq:
        if i not in unique2:
            unique2.append(i)
    elements = []
    for i in unique:
        if unique2[0]==li.count(i):
            elements.append(i)
    elements = sorted(elements,reverse=True)
    if k>len(elements):
        return -1
    return elements[k-1]

def highestFrequencyElement2(li,k):
    unique = {}
    for n in li:
        if n not in unique:
            unique[n] = 1
        else:
            unique[n] += 1
    # Getting all frequencies into a list
    freq = unique.values()
    maxfreq = max(freq)
    maxfreqKeys = []
    # Identify the keys maximum frequency
    for item in unique.items():
        if item[1] == maxfreq:
            maxfreqKeys.append(item[0])
    # Select the minimum from the keys with maximum frequency
    maxfreqKeys = sorted(maxfreqKeys,reverse=True)
    if k>len(maxfreqKeys):
        return -1
    return maxfreqKeys[k-1]



li = [1,2,3,9,8,7,3,4,2,1]
k=int(input())
highestFrequencyElement(li,k)
highestFrequencyElement2(li,k)
```

```
4
```

Out[9]:

```
-1
```

In [10]:

```
# Function to identify second largest frequency element
# If there are many such elements, return the smallest
# li = [1,2,3,2,1,4,4,9]
def secondLargestFrequency(li):
    unique = {}
    for i in li:
        if i not in unique:
            unique[i] = 1
        else:
            unique[i] += 1
    freq = unique.values()
    uniquefreq = []
    for i in freq:
        if i not in uniquefreq:
            uniquefreq.append(i)
    uniquefreq = sorted(uniquefreq,reverse=True)
    elements = []
    for item in unique.items():
        if item[1] == uniquefreq[1]:
            elements.append(item[0])
    elements = sorted(elements,reverse=False)
    return elements[0]

li = [1,2,3,2,1,4,4,9]
secondLargestFrequency(li)
```

Out[10]: 3

In [11]:

```
# Function to identify Kth largest frequency element
# If there are many such elements, return the smallest
# li = [9,8,7,6,5,2,3,4,9,6,7,7,7,6,7,6], k=4 -> 2
def kLargestFrequency(li,k):
    unique = {}
    for i in li:
        if i not in unique:
            unique[i] = 1
        else:
            unique[i] += 1
    freq = unique.values()
    uniquefreq = []
    for i in freq:
        if i not in uniquefreq:
            uniquefreq.append(i)
    uniquefreq = sorted(uniquefreq,reverse=True)
    elements = []
    if len(uniquefreq)>=k:
        for item in unique.items():
            if item[1] == uniquefreq[k-1]:
                elements.append(item[0])
        elements = sorted(elements,reverse=False)
        return elements[0]
    else:
        return -1

li = [9,8,7,6,5,2,3,4,9,6,7,7,7,6,7,6]
k=int(input())
kLargestFrequency(li,k)
```

```
2
```

Out[11]:

```
6
```

In [12]:
```
# Function to identify Kth lowest frequency element
# If there are many such elements, return the smallest
# li = [9,8,7,6,5,2,3,4,9,6,7,7,7,6,7,6], k=4 -> 2
def kLowestFrequency(li,k):
    unique = {}
    for i in li:
        if i not in unique:
            unique[i] = 1
        else:
            unique[i] += 1
    freq = unique.values()
    uniquefreq = []
    for i in freq:
        if i not in uniquefreq:
            uniquefreq.append(i)
    uniquefreq = sorted(uniquefreq,reverse=False)
    print(uniquefreq)
    elements = []
    if len(uniquefreq)>=k:
        for item in unique.items():
            if item[1] == uniquefreq[k-1]:
                elements.append(item[0])
        elements = sorted(elements,reverse=False)
        return elements[0]
    else:
        return -1

li = [9,8,7,6,5,2,3,4,9,6,7,7,7,6,7,6]
k=int(input())
kLowestFrequency(li,k)
```

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

Out[12]: 9

In [14]:

```
def kLargestFrequencyString(s,k):
    unique = {}
    for i in s:
        if i not in unique:
            unique[i] = 1
        else:
            unique[i] += 1
    freq = unique.values()
    uniquefreq = []
    for i in freq:
        if i not in uniquefreq:
            uniquefreq.append(i)
    uniquefreq = sorted(uniquefreq,reverse=True)
    elements = []
    if k<len(uniquefreq):
        for item in unique.items():
            if item[1] == uniquefreq[k-1]:
                elements.append(item[0])
        elements = sorted(elements,reverse=False)
        return elements[0]
    else:
        return -1
filepath = 'DataFiles/k-largest-frequency-input.txt'
with open(filepath,'r') as f:
    t=int(f.readline())
    for i in range(t):
        s=f.readline()
        k=int(f.readline())
        print(kLargestFrequencyString(s,k))
```

```
s
g
h
e
w
r
n
k
-1
-1
```

In [13]:
```
def kLargestFrequencyString(s,k):
    unique = {}
    for i in s:
        if i not in unique:
            unique[i] = 1
        else:
            unique[i] += 1
    freq = unique.values()
    uniquefreq = []
    for i in freq:
        if i not in uniquefreq:
            uniquefreq.append(i)
    uniquefreq = sorted(uniquefreq,reverse=True)
    elements = []
    if k<=len(uniquefreq):
        for item in unique.items():
            if item[1] == uniquefreq[k-1]:
                elements.append(item[0])
        elements = sorted(elements,reverse=False)
        return elements[0]
    else:
        return -1

s='abcdefbcdeab'
k=3
kLargestFrequencyString(s,k)
```

Out[13]: 'f'

In [ ]:
```

```