In [10]:
```
######## Question 1
import numpy as np
from collections import defaultdict

L1 = []

np.random.seed(56)

for i in np.random.randint(0, 100, 10):

    L1.extend([i] * np.random.randint(0, 100, 1)[0])

np.random.shuffle(L1)

# 1 & 2 - Get Unique Values, Count
L1_values, L1_counts = np.unique(L1, return_counts=True)
print("Unique Values =                ", L1_values)
print("Counts for Each Unique Value = ", L1_counts)

# 3 - Make a Dictionary
L1_dict = {L1_values[i] : L1_counts[i] for i, _ in enumerate(L1_counts)}

# 4 - Return Value that Occurs Most Frequently
most_freq = max(L1_dict, key=lambda key: L1_dict[key])
print("Value that appears most often = ", most_freq)
```

```
Unique Values =                [14 15 22 34 55 57 64 85 87 90]
Counts for Each Unique Value =  [11 12 33 43 31 89 66 24 80 10]
Value that appears most often =  57
```

In [13]:
```
######## Question 2
L2 = [879, 394, 235, 580, 628, 81, 206, 238, 927, 853, 622, 603, 110, 143, 824, 324

# 1 & 3 - Calculate the Sum of Evens and Sum of Numbers > 500
L2_SumEven = 0
L2_Sum500 = 0
i = 0
while i < len(L2):
    if (L2[i] % 2) == 0:
#        print(L2[i])
        L2_SumEven += L2[i]

    if L2[i] > 500:
#        print(L2[i])
        L2_Sum500 += L2[i]

    i += 1

print("Sum of Evens         = ", L2_SumEven)
print("Sum of Numbers > 500 = ", L2_Sum500)

# 2 - Define a Mean Function
def arr_mean(arr):
    sum_arr = 0
    i = 0
    len_arr = len(arr)
    while i < len_arr:
        sum_arr += arr[i]
        i += 1

    return sum_arr/len_arr

print("Mean of L2 = ", arr_mean(L2))
```

```
Sum of Evens         =  9418
Sum of Numbers > 500 =  12466
Mean of L2 =  534.2666666666667
```

In [14]:
```
######## Question 3

# 1 - Create function for pow(x, n)
def pow(x, n):
    if n == 0:
        return 1

    i = 1
    x_res = x
    while i < abs(n):
        x_res = x*x_res
        i += 1

    if n <= -1:
        x_res = 1/x_res

    return x_res
```

In [3]:
```
# 2 Calculate 2^10 and 3^-3
print(pow(2, 10))
print(pow(3, -3))
```

```
1024
0.037037037037037035
```

In [ ]: