

# Search

```
*search.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/search.py (3.4.4)*
File Edit Format Run Options Window Help

a=[]
n=int(input("Enter the length of array: "))
for _ in range(n):
    a.append(int(input("Enter the data: ")))

key=(int(input("Enter the data for searching: ")))
ind =a.index(key)
if ind !=-1:
    print("The index of key is: ", ind )
else:
    print("The key is not found")
```

# Search

```
search.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/search.py (3.4.4)
File Edit Format Run Options Window Help

def linearSearch(x, k):
    for i in range(len(x)):
        if (x[i] == k):
            print("The key is found in position:", i)

a=[]
n=int(input("Enter the length of array: "))
for _ in range(n):
    a.append(int(input("Enter the data: ")))

key=(int(input("Enter the data for searching: ")))
linearSearch(a, key)
```

# Search

```
search.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/search.py (3.4.4)
File Edit Format Run Options Window Help
def linearSearch(x, k):
    for i in range(len(x)):
        if (x[i] == k):
            print("The key is found in position:", i)
            break
    else:
        print("The key is not found")

a=[]
n=int(input("Enter the length of array: "))
for _ in range(n):
    a.append(int(input("Enter the data: ")))

key=(int(input("Enter the data for searching: ")))
linearSearch(a, key)
```

# Search

```
search.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/search.py (3.4.4)
File Edit Format Run Options Window Help

def linearSearch(x, k):
    for i in range(len(x)):
        if (x[i] == k):
            return(i)
    return(-1)

a=[]
n=int(input("Enter the length of array: "))
for _ in range(n):
    a.append(int(input("Enter the data: ")))

key=(int(input("Enter the data for searching: ")))
index=linearSearch(a, key)
if index!=-1:
    print("The key is found in position:", index)
else:
    print("The key is not found")
```

# Sequential Search

Sequential search

steps: 0



1	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

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# Binary Search

Binary search

37

steps: 0



Sequential search

steps: 0

37



www.penjee.com

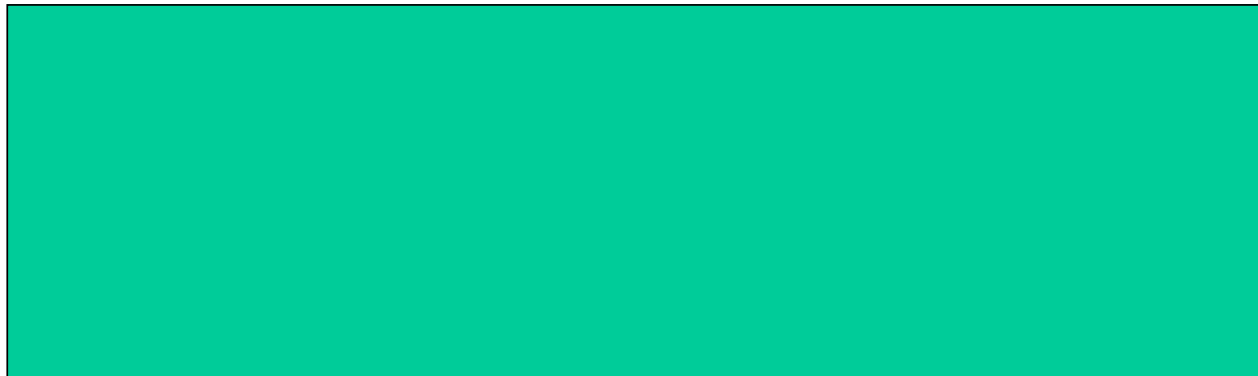
# Binary Search

Binary search

steps: 0



1	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
low								mid								high



# Binary Search

Binary search

steps: 0



Sequential search

steps: 0



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```
*binarysearch.py - /home/nowzari/Desktop/python/python-my/python/examples/15-for-ex1/binarysearch.  
File Edit Format Run Options Window Help  
  
def binary_search(a, k, lo=0, hi=None):  
    if hi is None:  
        hi = len(a)-1  
    while lo <= hi:  
        mid = (lo+hi)//2  
        if a[mid]==k:  
            return mid  
        elif a[mid] < k:  
            lo = mid+1  
        else:  
            hi = mid -1  
  
    return -1  
  
a=[]  
n=int(input("Enter the length of array: "))  
for i in range(n):  
    a.append(int(input("Enter the data: ")))  
  
key=(int(input("Enter the data for searching: ")))  
index=binary_search(a, key, 0, len(a)-1)  
if index!=-1:  
    print("The key is found in position:", index)  
else:  
    print("The key is not found")
```

# poly evaluation

\*eval1.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/eval1.py (3.4.4)\*

File Edit Format Run Options Window Help

#2x^3+3x^2+4x+5

```
def eval(a, x):
    p=1
    s=a[0]
    for ai in a[1:]:
        p=x*p
        s=s+(ai * p)
    return s

a=[]
n=int(input("Enter number of elements: "))
for _ in range(n):
    a.append(int(input("Enter the data: ")))

x=(int(input("Enter an integer: ")))
s=eval(a, x)
print("The result is: ", s)
```

	0	1	2	3	
a	5	4	3	2	$\frac{x}{2}$
	s	p	a <sub>i</sub>		
	5	1	4		
	13	2	3		
	25	4	2		
	42	8			

# poly evaluation

```
***~y
Enter number of elements: 4
Enter the data: 5
Enter the data: 4
Enter the data: 3
Enter the data: 2
Enter an integer: 3
The result is: 98
```

\*eval2.py - /home/nowzari/Desktop/python/python-my/python/examples/15-for-ex1/eval2.py (3.5.2)

File Edit Format Run Options Window Help

#9x^6+3x^5+3x+10

```
def eval(a, b, x):
    p=1
    s=0
    for i in range(0,len(a)):
        p=x**b[i]
        s=s+(a[i] * p)
    return s
```

```
a=[]
b=[]
n=int(input("Enter number of elements: "))
for i in range(n):
    a.append(int(input("Enter the %d th factor: " % i)))
for i in range(n):
    b.append(int(input("Enter the %d th power: " % i)))

x=(int(input("Enter an integer: ")))
s=eval(a, b, x)
print("The result is: ", s)
```

a → 

10	3	3	9
----	---	---	---

b → 

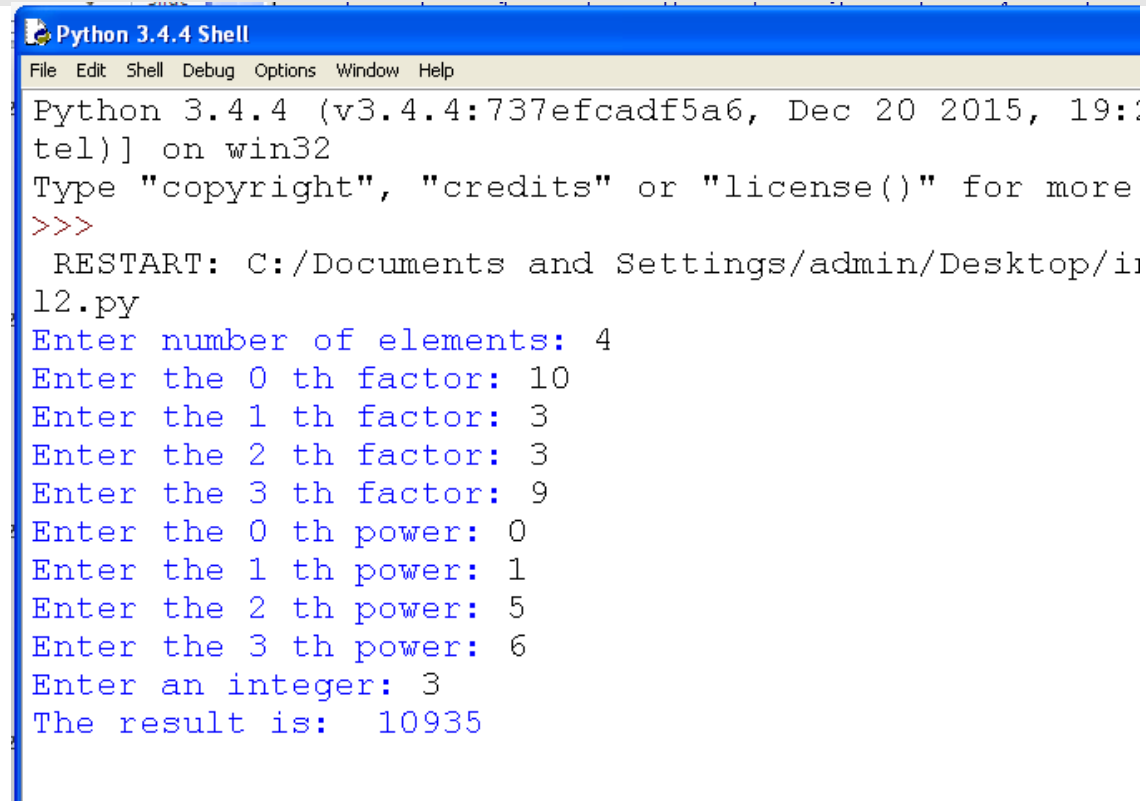
0	1	2	3
---	---	---	---

$\frac{x}{2}$

s	p	i
0	1	0
10	1	1
16	2	1
112	32	2
<u>698</u>	64	3
	576	

76

# poly evaluation



```
Python 3.4.4 Shell
File Edit Shell Debug Options Window Help
Python 3.4.4 (v3.4.4:737efcadf5a6, Dec 20 2015, 19:00:00) on win32
Type "copyright", "credits" or "license()" for more
>>>
RESTART: C:/Documents and Settings/admin/Desktop/12.py
Enter number of elements: 4
Enter the 0 th factor: 10
Enter the 1 th factor: 3
Enter the 2 th factor: 3
Enter the 3 th factor: 9
Enter the 0 th power: 0
Enter the 1 th power: 1
Enter the 2 th power: 5
Enter the 3 th power: 6
Enter an integer: 3
The result is: 10935
```

# Counting

counting.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/counting.py (3.4.4)

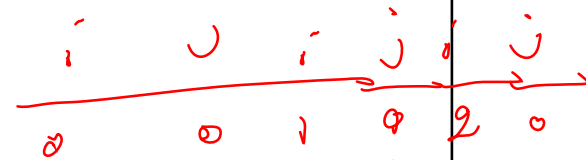
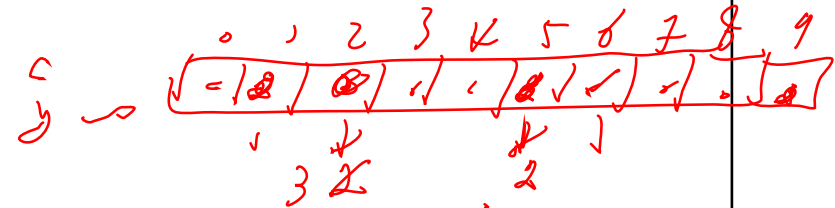
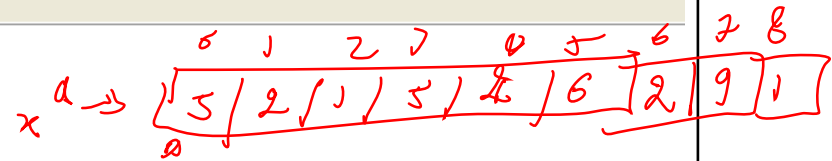
File Edit Format Run Options Window Help

```
def countarray(x, y):
    for i in range(len(x)):
        for j in range(len(y)):
            if (x[i]==j):
                y[j]=y[j]+1
    return y
```

$O(n \cdot m)$

break

```
a=[]
n=int(input("Enter the number of elements: "))
m=int(input("Enter the range of elements: "))
for i in range(n):
    a.append(int(input("Enter the data: ")))
c=[0]*(m+1)
countarray(a, c)
print("The array is: ", a)
print("The result is: ", c)
```



# Counting

```
Enter the number of elements: 10
Enter the range of elements: 6
Enter the data: 6
Enter the data: 5
Enter the data: 6
Enter the data: 3
Enter the data: 1
Enter the data: 1
Enter the data: 2
Enter the data: 6
Enter the data: 5
Enter the data: 1
The array is: [6, 5, 6, 3, 1, 1, 2, 6, 5, 1]
The result is: [0, 3, 1, 1, 0, 2, 3]
```

$a = [ ]$   
 $[7, 12]$   
 $[7, 12, 23, 6, 4, 11]$

counting.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/counting.py (3.4.4)

File Edit Format Run Options Window Help

```

def inputList(a, n):
    string=input("enter the data: ")
    prev = 0
    index = 0
    for item in string :
        if item == ' ':
            a.append(int(string[prev:index]))
            prev = index + 1
            index=index+1
        else:
            a.append(int(string[prev:index]))
    return a

def countarray(x, y):
    for i in range(len(x)):
        for j in range(len(y)):
            if (x[i]==j):
                y[j]=y[j]+1
    return y

a=[]
n=int(input("Enter the number of elements: "))
m=int(input("Enter the range of elements: "))
inputList(a, n)
c=[0]*(m+1)
countarray(a, c)
print("The array is: ", a)
print("The result is: ", c)

```

$0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \ 11$   
 $7 \ 12 \ 23 \ 6 \ 4 \ 11$   
 $\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$   
 $\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$   

i	index
0	7
1	12
2	23
3	6
4	4
5	11



# Counting

```
counting.py
Enter the number of elements: 10
Enter the range of elements: 6
enter the data: 6 5 6 3 1 1 2 6 5 1
The array is: [6, 5, 6, 3, 1, 1, 2, 6, 5, 1]
The result is: [0, 3, 1, 1, 0, 2, 3]
```

# Counting

counting1.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/counting1.py (3.4.4)

File Edit Format Run Options Window Help

```
def countarray(x, y):  
    for i in range(len(x)):  
        for j in range(len(y)):  
            if (x[i]==j):  
                y[j]=y[j]+1  
    return
```

"7 123 18 2"  
[7, 120, 18, 2]

```
a=[]  
n=int(input("Enter the number of elements: "))  
m=int(input("Enter the range of elements: "))  
print("enter the data:", end='')  
a=list(map(int, input().strip().split(" ")))  
c=[0]*(m+1)  
countarray(a, c)  
print("The array is: ", a)  
print("The result is: ", c)
```

# Counting

```
counting.py
Enter the number of elements: 10
Enter the range of elements: 6
enter the data: 6 5 6 3 1 1 2 6 5 1
The array is: [6, 5, 6, 3, 1, 1, 2, 6, 5, 1]
The result is: [0, 3, 1, 1, 0, 2, 3]
```

# Counting

```

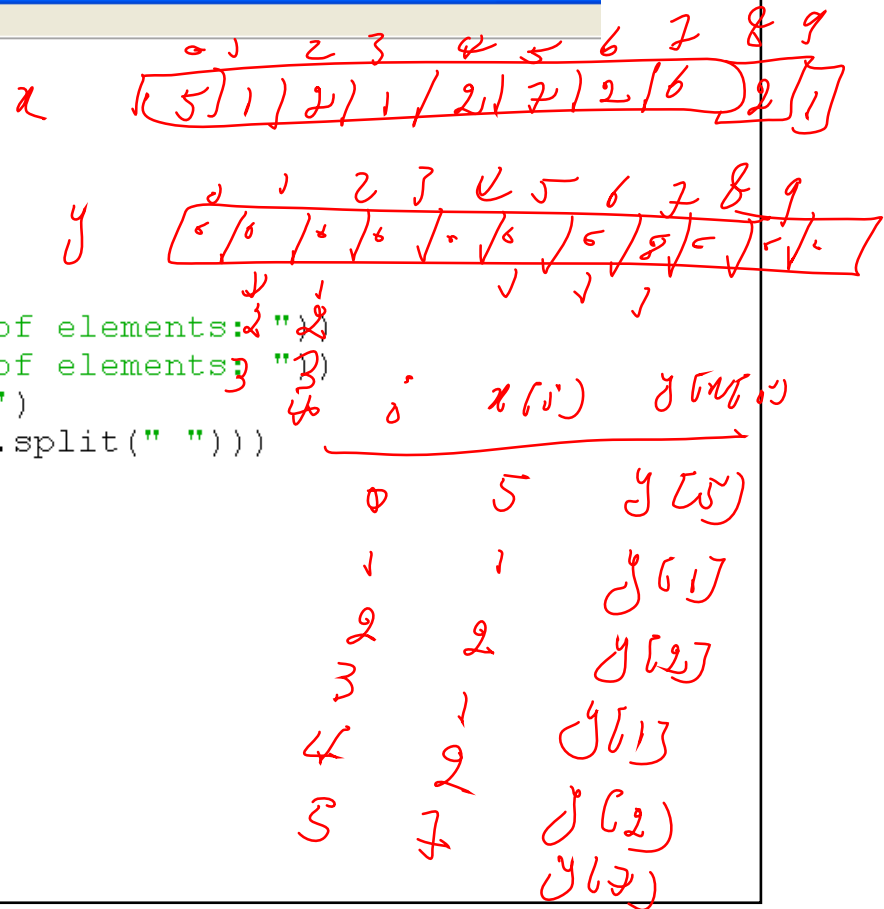
counting1.py - C:/Documents and Settings/admin/Desktop/intro-python/examples/17-1/counting1.py (3.4.4)
File Edit Format Run Options Window Help

def countarray(x, y):
    for i in range(len(x)):
        y[x[i]] = y[x[i]] + 1
    return

a = []
n = int(input("Enter the number of elements: "))
m = int(input("Enter the range of elements: "))
print("enter the data:", end='')
a = list(map(int, input().strip().split(" ")))
c = [0] * (m+1)
countarray(a, c)
print("The array is: ", a)
print("The result is: ", c)

```

$O(n)$



# Counting

```
counting.py
Enter the number of elements: 10
Enter the range of elements: 6
enter the data: 6 5 6 3 1 1 2 6 5 1
The array is: [6, 5, 6, 3, 1, 1, 2, 6, 5, 1]
The result is: [0, 3, 1, 1, 0, 2, 3]
```

**End**