

Example:

```
def fun1(x,*a):  
    print(x)  
    print(a)
```

```
def fun2(x,*y,z=None):  
    print(x,y,z)
```

```
fun1(10)  
fun1(100,200,300,400)  
fun2(1)  
fun2(10,z=100)  
fun2(100,200,300,400)  
fun2(1000,2000,3000,4000,z=5000)
```

Output:

```
()  
100  
(200, 300, 400)  
1 () None  
10 () 100  
100 (200, 300, 400) None  
1000 (2000, 3000, 4000) 5000
```

Example

```
def add(*values,s=0):  
    for value in values:  
        s=s+value  
    return s
```

```
total1=add(10,20,30,40,50)  
total2=add(1,2,3,4,5,s=100)  
print(f'Total1 {total1}')  
print(f'Total2 {total2}')
```

Output

```
Total1 150
```

Total2 115

Keywords arguments

Keyword arguments are prefix with **.

Keyword argument is type of dictionary.

A function is defined with one keyword argument.

Syntax:

```
def <function-name>(**kwargs):  
    statement-1  
    statement-2
```

Example:

```
def fun1(**a):  
    print(a,type(a))
```

```
fun1()  
fun1(x=100)  
fun1(x=100,y=200,z=300)
```

Output:

```
{ } <class 'dict'>  
{'x': 100} <class 'dict'>  
{'x': 100, 'y': 200, 'z': 300} <class 'dict'>
```

Example:

```
def add1(*values):  
    s=0  
    for value in values:  
        print(value)  
        s=s+value  
    return s
```

```
def add2(**kwargs):  
    s=0  
    for key,value in kwargs.items():
```

```
    print(key,value)
    s=s+value
return s
```

```
total1=add1(100,200)
print(f'Total {total1}')
total2=add2(sales1=100,sales2=200)
print(f'Total {total2}')
```

Output:

```
100
200
Total 300
sales1 100
sales2 200
Total 300
```

Example:

```
def total_marks(**kwargs):
    s=0
    for key,value in kwargs.items():
        print(key,value)
        s=s+value
    return s
```

```
name=input("Enter Name")
sub1=int(input("Subject1 "))
sub2=int(input("Subject2 "))
print(name)
total=total_marks(sub1=sub1,sub2=sub2)
print(total)
```

Output:

```
Enter NameNaresh
Subject1 60
Subject2 70
```

```
naresh
sub1 60
sub2 70
130
```

What is difference between *args and **args?

Both are variable length arguments only.

*args → receives only value

**args → receives key and value

*args → is of type tuple

**args → is of type dictionary

Example:

```
def add(**kwargs):
    s=0
    for key,value in kwargs.items():
        print(key,value)
        s=s+value
    print(s)
```

```
dict1={'a':100,'b':200,'c':300}
add(**dict1)
```

Output:

```
a 100
b 200
c 300
600
```

Example:

```
def max_sales(**kwargs):
    m=0
    for month,sales in kwargs.items():
        if sales>m:
            m=sales
```

```
t=(month,sales)
```

```
return t
```

```
result=max_sales(jan=5000,feb=6000,mar=4000)
```

```
print(result)
```

```
result=max_sales(naresh=70000,suresh=65000,kiran=25000)
```

```
print(result)
```

Output

```
('feb', 6000)
```

```
('naresh', 70000)
```

Nested Functions