

## **Global and Local Variables in Python**

Global variables are the one that are defined and declared outside a function and we need to use them inside a function.

### **Identify how the outputs are obtained for the following programs?**

#### **Program1:**

# This function uses global variable s

def f():

print(s)

# Global scope

s = "Geeksforgeeks"

f()

#### **Program2:**

# This function has a variable with name same as s.

def f():

s = "Me too."

print(s)

# Global scope

s = "I love Geeksforgeeks"

f()

print(s)

**The question is, what will happen if we change the value of s inside of the function f()? Will it affect the global s as well? We test it in the following code:**

#### **Program3:**

def f():

print(s)

# This program will NOT show error if we comment below line.

s = "Me too."

print(s)

# Global scope

s = "I love Geeksforgeeks"

f()

print(s)

#### **Program4:**

```

# This function modifies the global variable 's'
def f():
    global s
    print(s)
    s = "Look for Geeksforgeeks Python Section"
    print(s)

# Global Scope
s = "Python is great!"
f()
print(s)

```

### **Program5:**

```

a = 1

# Uses global because there is no local 'a'
def f():
    print('Inside f() : ', a)

# Variable 'a' is redefined as a local
def g():
    a = 2
    print('Inside g() : ', a)

# Uses global keyword to modify global 'a'
def h():
    global a
    a = 3
    print('Inside h() : ', a)

# Global scope
print('global : ',a)

f()

print('global : ',a)

g()

```

```
print('global : ',a)
```

```
h()
```

```
print('global : ',a)
```

**Program6:**

```
def foo(x, y):
```

```
    global a
```

```
    a = 42
```

```
    x,y = y,x
```

```
    b = 33
```

```
    b = 17
```

```
    c = 100
```

```
    print(a,b,x,y)
```

```
a, b, x, y = 1, 15, 3,4
```

```
foo(17, 4)
```

```
print(a, b, x, y)
```

**We will examine now what will happen, if we use the global keyword inside nested functions.**

**Program7:**

```
def f():
```

```
    city = "Hamburg"
```

```
    def g():
```

```
        global city
```

```
        city = "Geneva"
```

```
    print("Before calling g: " + city)
```

```
    print("Calling g now:")
```

```
    g()
```

```
    print("After calling g: " + city)
```

```
f()
```

```
print("Value of city in main: " + city)
```

### **Program8:**

```
def f():  
    city = "Munich"  
    def g():  
        nonlocal city  
        city = "Zurich"  
    print("Before calling g: " + city)  
    print("Calling g now:")  
    g()  
    print("After calling g: " + city)  
city = "Stuttgart"  
f()  
print("'city' in main: " + city)
```

### **Program9:**

```
def f():  
    #city = "Munich"  
    def g():  
        global city  
        city = "Zurich"  
    print("Before calling g: " + city)  
    print("Calling g now:")  
    g()  
    print("After calling g: " + city)  
city = "Stuttgart"  
f()  
print("'city' in main: " + city)
```

