# Python Programming

EDUCATION FOR PEACE

(ESTD-1995)

## RGM College of Engineering & Technology (Autonomous)

Department of Computer Science & Engineering

Academic Year : 2020-2021

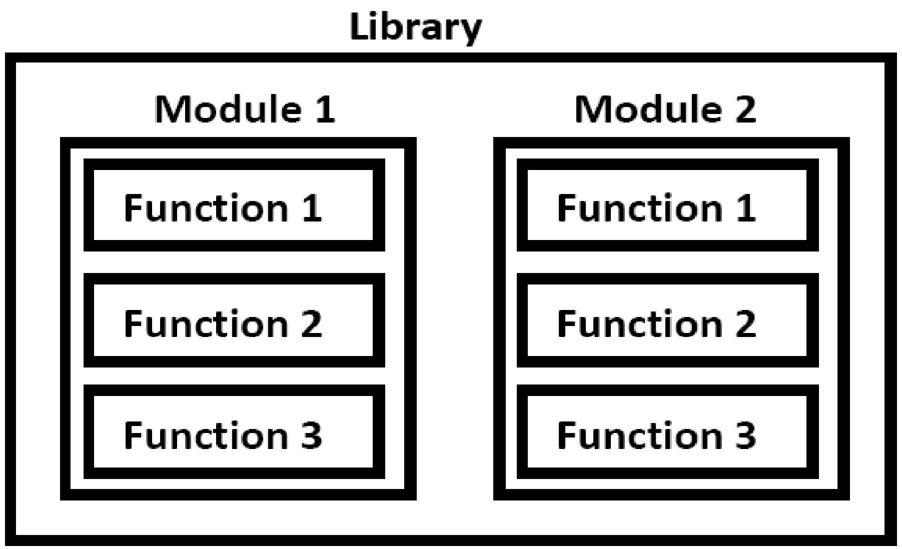
# FUNCTIONS - 4

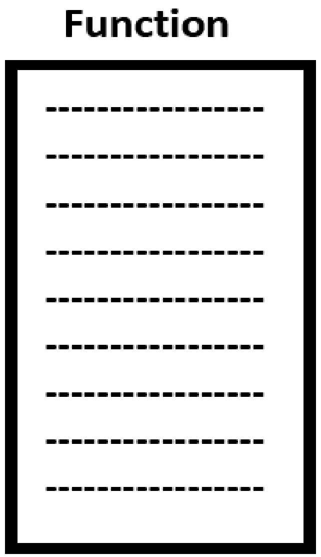
# Agenda:

1. **Types of Variables**

# Function vs Module vs Package vs Library

1. A group of lines with some name is called a function.
2. A group of functions saved to a file , is called Module.
3. A group of Modules is nothing but Package.
4. A group of related packages is nothing but Library.





# 4.TYPES OF VARIABLES

## Types of Variables:

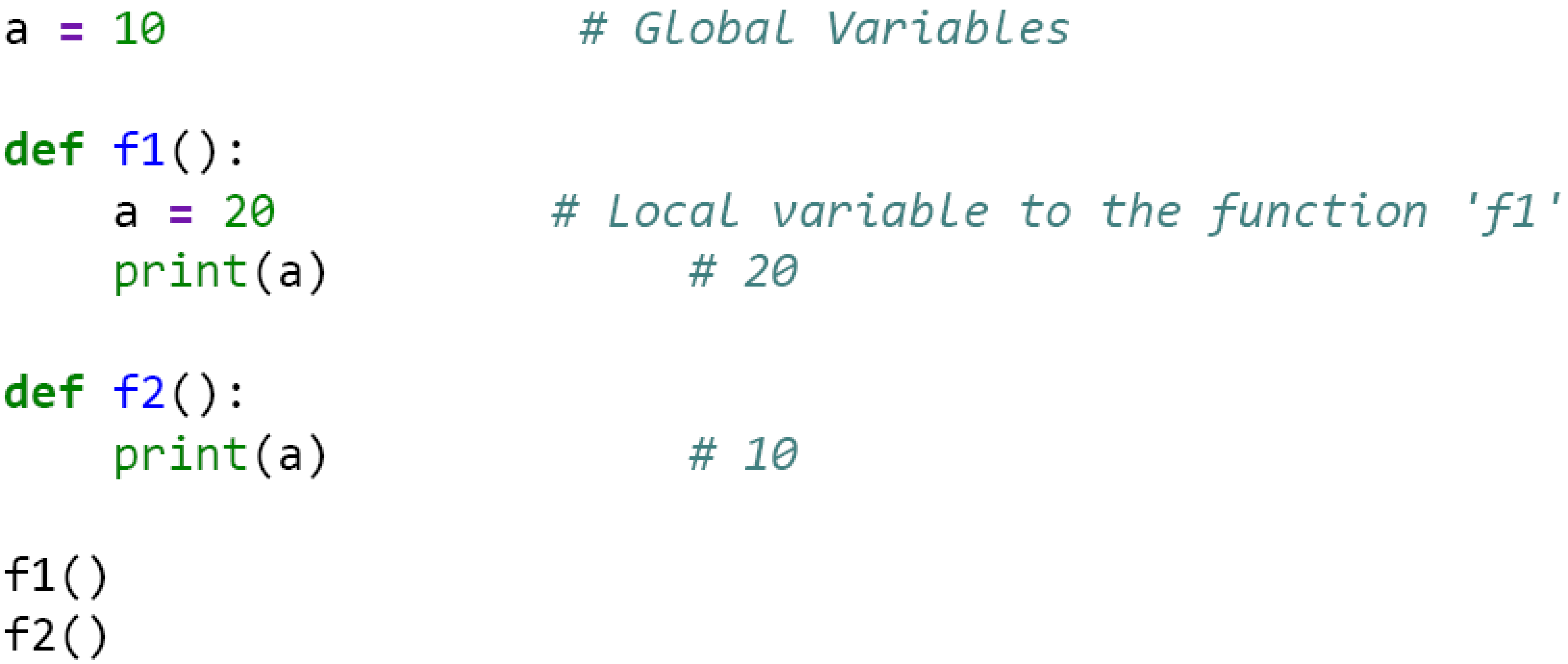
Python supports 2 types of variables.

1. Global Variables
2. Local Variables

### 1. Global Variables

- ❑ The variables which are declared outside of function are called global variables.
- ❑ These variables can be accessed in all functions of that module.

**Consider the following example,**



```
a = 10                  # Global Variables

def f1():
    a = 20             # Local variable to the function 'f1'
    print(a)                # 20

def f2():
    print(a)                # 10

f1()
f2()
```

**Output:**

20

10

Suppose our requirement is, we don't want local variable. Can you please refer the local variable as the global variable only.

**How you can do that?**

For that, one special keyword is used, called as **global.**

**global keyword:**

We can use global keyword for the following 2 purposes:

1. To declare global variables explicitly inside function.
2. To make global variable available to the function so that we can perform required modifications.

**Eg 1:**

```
a=10
def f1():
    a=777
    print(a)
def f2():
    print(a)
f1()
f2()
```

**Output:**

```
777
10
```

**Eg 2:**

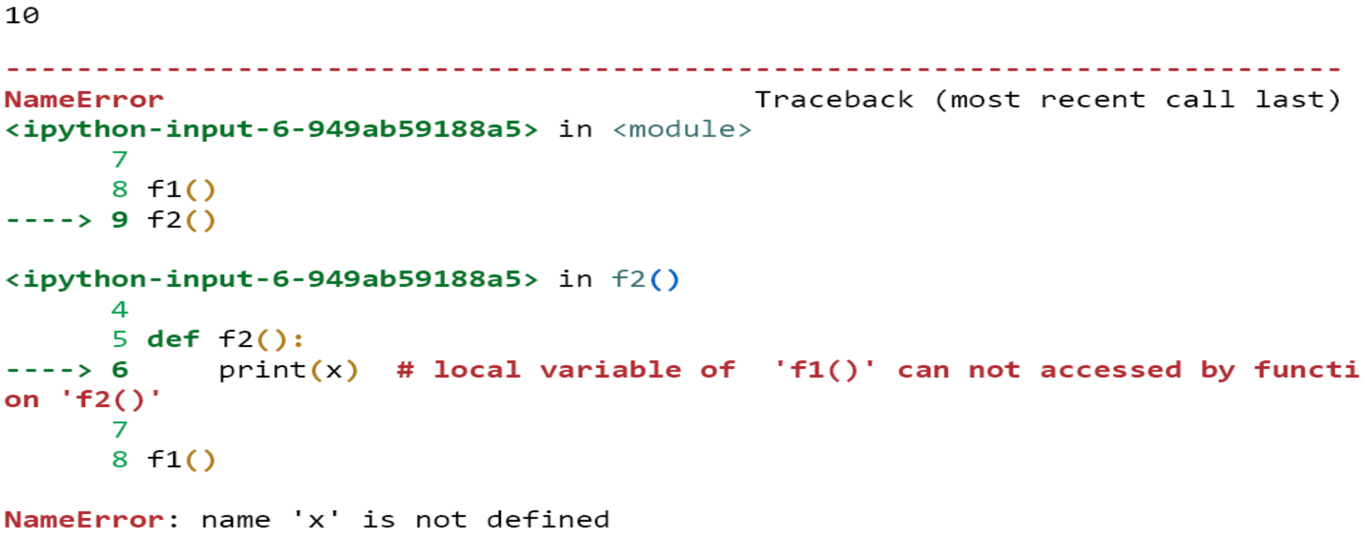
```
a=10
def f1():
    global a     # To bring global variable to the function for required modifications.
    a=777        # We are changing the value of the local variable.
    print(a)
def f2():
    print(a)
f1()
f2()
```

**Output:**

```
777
777
```

**Eg 3:**

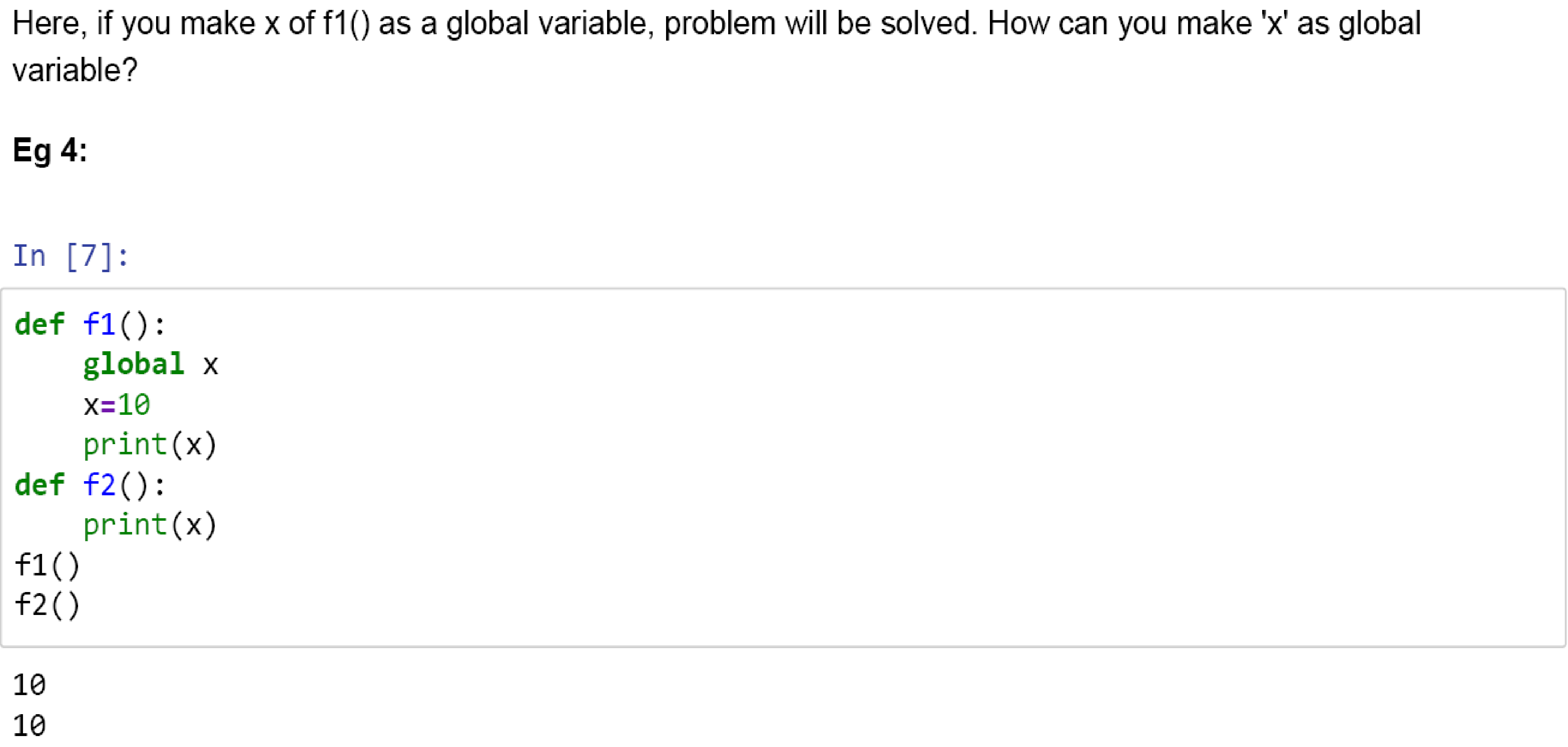
```
def f1():
    x = 10        # local variable of 'f1()'
    print(x)
def f2():
    print(x)      # local variable of 'f1()' can not accessed by function 'f2()'
f1()
f2()
```



```
10
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-6-949ab59188a5> in <module>
      7 
      8 f1()
----> 9 f2()

<ipython-input-6-949ab59188a5> in f2()
      4 
      5 def f2():
----> 6     print(x)  # local variable of  'f1()' can not accessed by functi
on 'f2()'
      7 
      8 f1()

NameError: name 'x' is not defined
```



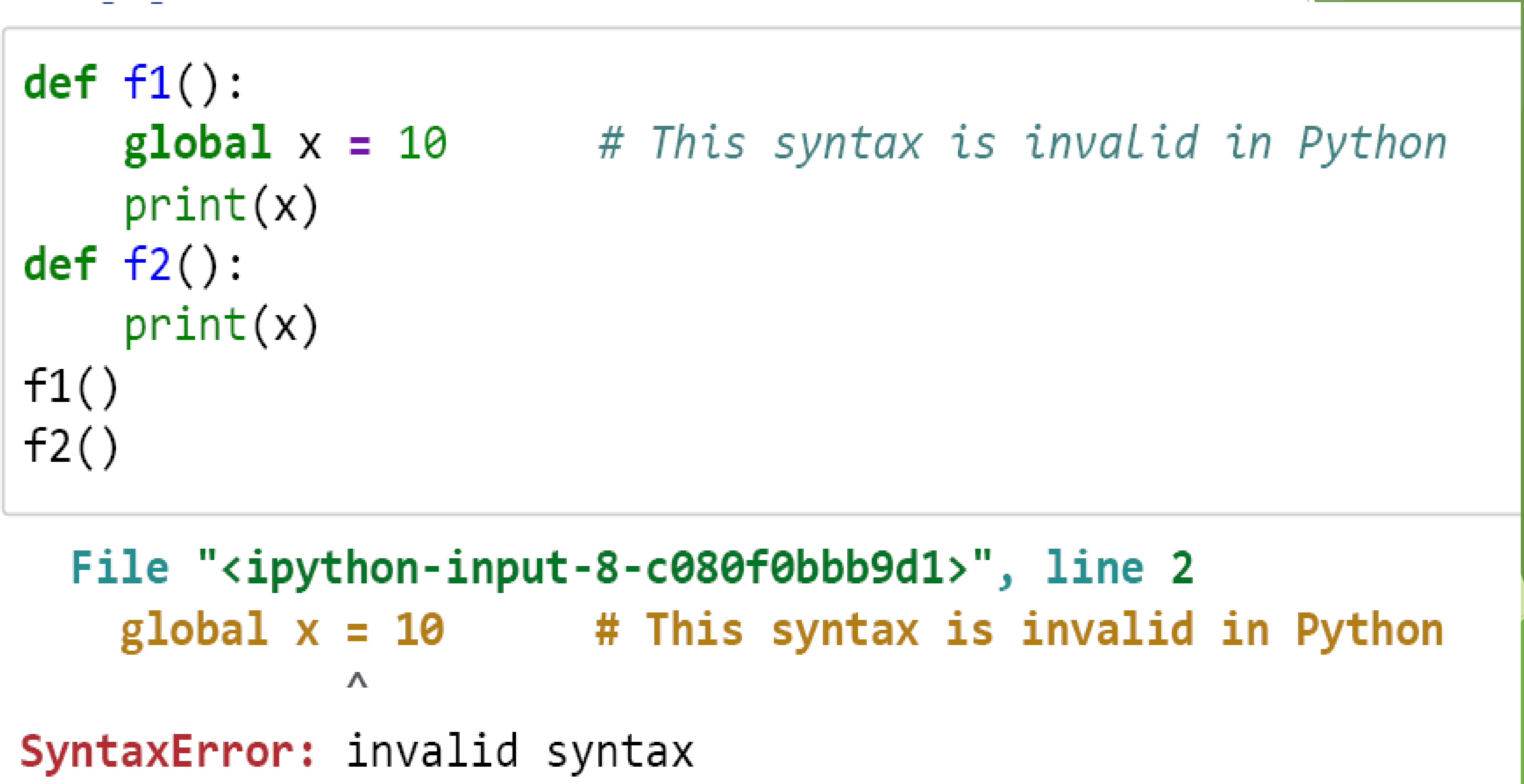
Here, if you make x of f1() as a global variable, problem will be solved. How can you make 'x' as global variable?

**Eg 4:**

In [7]:

```
def f1():
    global x
    x=10
    print(x)
def f2():
    print(x)
f1()
f2()
```

```
10
10
```



```
def f1():
    global x = 10       # This syntax is invalid in Python
    print(x)
def f2():
    print(x)
f1()
f2()
```

```
  File "<ipython-input-8-c080f0bbb9d1>", line 2
    global x = 10       # This syntax is invalid in Python
             ^
SyntaxError: invalid syntax
```

**Another Example:**

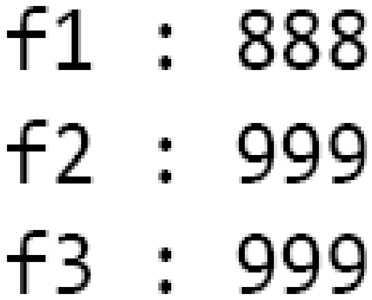
```
def f1():
    global a
    a = 888
    print('f1 :',a)
def f2():
    global a
    a=999               # global variable 'a' is overrides the old value.
    print('f2 :',a)
f1()
f2()
```

**Output:**

```
f1 : 888
f2 : 999
```

**Eg:**

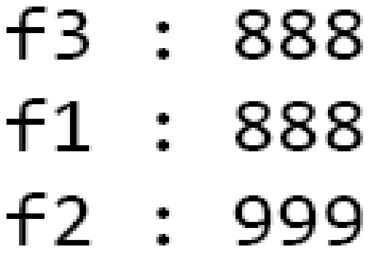
```
def f1():
    global a
    a = 888
    print('f1 :',a)
def f2():
    global a
    a=999
    print('f2 :',a)
def f3():
    print('f3 :',a)
f1()
f2()
f3()
```



```
f1 : 888
f2 : 999
f3 : 999
```

**Eg:**

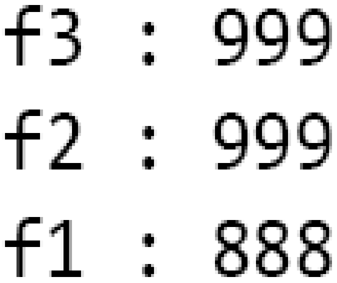
```
def f1():
    global a
    a = 888
    print('f1 :',a)
def f2():
    global a
    a=999
    print('f2 :',a)
def f3():
    print('f3 :',a)
f3()
f1()
f2()
```



```
f3 : 888
f1 : 888
f2 : 999
```

**Eg:**

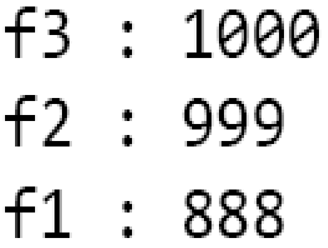
```
def f1():
    global a
    a = 888
    print('f1 :',a)
def f2():
    global a
    a=999
    print('f2 :',a)
def f3():
    print('f3 :',a)
f3()
f2()
f1()
```



```
f3 : 999
f2 : 999
f1 : 888
```

**Eg:**

```
def f1():
    global a
    a = 888
    print('f1 :',a)
def f2():
    global a
    a=999
    print('f2 :',a)
def f3():
    a = 1000
    print('f3 :',a)
f3()
f2()
f1()
```



```
f3 : 1000
f2 : 999
f1 : 888
```

## Another Example:

```
def f1():
    global a
    a = 888            # global variable 'a' is overrides the old value.
    print('f1 :',a)
def f2():
    global a
    a=999
    print('f2 :',a)
f2()
f1()
```

**Note:**

- If global variable and local variable having the same name, then we can access global variable inside a function using **globals()** function.

**Eg:**

```
a=10            #global variable
def f1():
   a=777        #local variable
print(a)
f1()            ➔777
```

**Eg:**

```
a=10                #global variable
def f1():
    a=777           #local variable
    print(a)
    print(globals()['a'])
f1()
```

**Output:**

```
777
10
```

**Another Example:**

```
def f1():
    a = 10
    global a
    a = 50
    print(a)
f1()
```

```
SyntaxError: name 'a' is assigned to before global declaration.
```

```
def f1():
    global a
    a = 10
    a = 50
    print(a)
f1()        ➔50
```

# Any question?

If you try to practice programs yourself, then you will learn many things automatically

Spend few minutes and then enjoy the study

# Thank You