In [1]:
```
print(x)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1353120783.py in <module>
----> 1 print(x)

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

In [2]:
```
def scope_test():
    x = 123
    print(x)
```

In [3]:
```
scope_test()
```

```
123
```

In [4]:
```
print(x)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1353120783.py in <module>
----> 1 print(x)

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

In [5]:
```
def my_function():
    global var
    var = 2
    print("Do I know that variable?", var)


var = 1
my_function() # Assignment var = 2
print(var)
```

```
Do I know that variable? 2
2
```

In [6]:
```
def my_function():
    var = 2
    print("Do I know that variable?", var)


var = 1
my_function()
print(var)
```

```
Do I know that variable? 2
1
```

In [7]:
```
a = 1


def fun():
    global a
    a = 2
```

```
    print(a)


print(a)
```

```
1
```

In [8]:

```
a = 1


def fun():
    global a
    a = 2
#     print(a)

fun()
print(a)
```

```
2
```

In [9]:

```
def fun():
    print(x)

fun()
x = 1
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/3154758480.py in <module>
      2     print(x)
      3
----> 4 fun()
      5 x = 1

~\AppData\Local\Temp/ipykernel_10176/3154758480.py in fun()
      1 def fun():
----> 2     print(x)
      3
      4 fun()
      5 x = 1

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

In [10]:

```
def fun():
    print(x)

x = 1
fun()
```

```
1
```

In [11]:

```
my_list = [1, 2, "A", None, True, [3, 4, "String"]]
```

In [12]:

```
my_list.append(0)
```

In [13]:

```
my_list
```

Out[13]:

```
[1, 2, 'A', None, True, [3, 4, 'String'], 0]
```

In [14]:
```
my_tuple = (1, 10, 100, 1000)
```

In [15]:
```
my_tuple[1]
```

Out[15]:
```
10
```

In [16]:
```
my_tuple[-1]
```

Out[16]:
```
1000
```

In [17]:
```
my_tuple[:2]
```

Out[17]:
```
(1, 10)
```

In [18]:
```
my_tuple[1:]
```

Out[18]:
```
(10, 100, 1000)
```

In [19]:
```
my_tuple.append(10000)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/3512799203.py in <module>
----> 1 my_tuple.append(10000)

AttributeError: 'tuple' object has no attribute 'append'
```

In [20]:
```
del my_tuple[0]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/3855699595.py in <module>
----> 1 del my_tuple[0]

TypeError: 'tuple' object doesn't support item deletion
```

In [21]:
```
print(my_tuple)
```

```
(1, 10, 100, 1000)
```

In [22]:
```
my_tuple[1] = 5
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/2725793584.py in <module>
----> 1 my_tuple[1] = 5

TypeError: 'tuple' object does not support item assignment
```

In [23]:
```
len(my_tuple)
```

```
4
```

Out[23]:

In [24]:
```
my_tuple[1]
```

Out[24]:
```
10
```

In [25]:
```
my_list[2]
```

Out[25]:
```
'A'
```

In [26]:
```
phone_numbers = {'boss' : 5551234567, 'Suzy' : 22657854310}
```

In [27]:
```
phone_numbers['Suzy']
```

Out[27]:
```
22657854310
```

In [28]:
```
phone_numbers['boss']
```

Out[28]:
```
5551234567
```

In [29]:
```
phone_numbers['president']
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1943925618.py in <module>
----> 1 phone_numbers['president']

KeyError: 'president'
```

In [30]:
```
my_tuple
```

Out[30]:
```
(1, 10, 100, 1000)
```

In [31]:
```
my_tuple[5]
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/3672985813.py in <module>
----> 1 my_tuple[5]

IndexError: tuple index out of range
```

In [32]:
```
phone_numbers.keys()
```

Out[32]:
```
dict_keys(['boss', 'Suzy'])
```

In [33]:
```
phone_numbers.items()
```

Out[33]:
```
dict_items([('boss', 5551234567), ('Suzy', 22657854310)])
```

In [34]:
```
phone_numbers.values()
```

Out[34]:
```
dict_values([5551234567, 22657854310])
```

In [35]:
```
phone_numbers
```

Out[35]:
```
{'boss': 5551234567, 'Suzy': 22657854310}
```

In [36]:
```
phone_numbers['boss'] = 4441234567
```

In [37]:
```
phone_numbers
```

Out[37]:
```
{'boss': 4441234567, 'Suzy': 22657854310}
```

In [38]:
```
phone_numbers['taxi'] = 123890
```

In [39]:
```
phone_numbers
```

Out[39]:
```
{'boss': 4441234567, 'Suzy': 22657854310, 'taxi': 123890}
```

In [40]:
```
phone_numbers.update({'airport':789654})
# phone_numbers['airport'] = 789654
```

In [41]:
```
phone_numbers
```

Out[41]:
```
{'boss': 4441234567, 'Suzy': 22657854310, 'taxi': 123890, 'airport': 789654}
```

In [42]:
```
del phone_numbers['airport']
```

In [43]:
```
phone_numbers
```

Out[43]:
```
{'boss': 4441234567, 'Suzy': 22657854310, 'taxi': 123890}
```

In [44]:
```
phone_numbers.popitem()
```

Out[44]:
```
('taxi', 123890)
```

In [45]:
```
phone_numbers
```

Out[45]:
```
{'boss': 4441234567, 'Suzy': 22657854310}
```

In [46]:
```
my_tuple = (1, 10, 100)
```

In [47]:
```
my_tuple.append(1000)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1874685527.py in <module>
----> 1 my_tuple.append(1000)

AttributeError: 'tuple' object has no attribute 'append'
```

In [51]:
```
t1 = my_tuple + (1000)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1393357476.py in <module>
----> 1 t1 = my_tuple + (1000)

TypeError: can only concatenate tuple (not "int") to tuple
```

In [53]:
```
my_tuple = (1, 10, 100)

my_tuple = my_tuple + (1000, 10000)
```

In [54]:
```
my_tuple = (1, 10, 100)
```

In [55]:
```
my_tuple.append(1000)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1874685527.py in <module>
----> 1 my_tuple.append(1000)

AttributeError: 'tuple' object has no attribute 'append'
```

In [56]:
```
my_tuple = my_tuple + (1000, 10000) # Bukan mengubah my_tuple, tetapi membuat variab
```

In [57]:
```
my_tuple
```

Out[57]:
```
(1, 10, 100, 1000, 10000)
```

In [58]:
```
phone_numbers.items()
```

Out[58]:
```
dict_items([('boss', 4441234567), ('Suzy', 22657854310)])
```

In [59]:
```
print(phone_numbers.items())
```

```
dict_items([('boss', 4441234567), ('Suzy', 22657854310)])
```

In [60]:
```
x = 1
```

In [61]:
```
x
```

Out[61]:
```
1
```

In [62]:

```
print(x)
```

```
1
```

In [69]:

```
x = int(input())

print(1 / x)

print(x + 1)
```

```
0
---------------------------------------------------------------------------
ZeroDivisionError                         Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/3654565815.py in <module>
      1 x = int(input())
----> 2 print(1 / x)
      3
      4 print(x + 1)

ZeroDivisionError: division by zero
```

In [70]:

```
x = int(input("Enter a number:"))

try:
    print(1 / x)
except:
    print("Hasilnya error, mungkin Anda memasukkan angka 0")

print(x + 1)
```

```
Enter a number:10
0.1
11
```

In [71]:

```
x = int(input("Enter a number:"))

try:
    print(1 / x)
except:
    print("Hasilnya error, mungkin Anda memasukkan angka 0")

print(x + 1)
```

```
Enter a number:0
Hasilnya error, mungkin Anda memasukkan angka 0
1
```

In [72]:

```
x = int(input("Enter a number:"))

try:
    print(1 / x)
except:
    print("Hasilnya error, mungkin Anda memasukkan angka 0")

print(x + 1)
```

```
Enter a number:Carlo
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/4114923848.py in <module>
----> 1 x = int(input("Enter a number:"))
```

```
      2
      3 try:
      4     print(1 / x)
      5 except:

ValueError: invalid literal for int() with base 10: 'Carlo'
```

In [73]:
```
try:
    x = int(input("Enter a number:"))
    print(1 / x)
except:
    print("Hasilnya error: Masukkan angka selain 0 dan bukan huruf")

print(x + 1)
```

```
Enter a number:Carlo
Hasilnya error: Masukkan angka selain 0 dan bukan huruf
1
```

In [74]:
```
try:
    x = int(input("Enter a number:"))
    print(1 / x)
except:
    print("Hasilnya error: Masukkan angka selain 0 dan bukan huruf")

print(x + 1)
```

```
Enter a number:0
Hasilnya error: Masukkan angka selain 0 dan bukan huruf
1
```

In [75]:
```
try:
    value = int(input("Enter a value: "))
    print(value/value)
except ValueError:
    print("Bad input...")
except ZeroDivisionError:
    print("Very bad input...")
except:
    print("Booo!")
```

```
Enter a value: String
Bad input...
```

In [76]:
```
int("String")
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/1428859823.py in <module>
----> 1 int("String")

ValueError: invalid literal for int() with base 10: 'String'
```

In [77]:
```
5 / 0
```

```
---------------------------------------------------------------------------
ZeroDivisionError                         Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/2219314525.py in <module>
----> 1 5 / 0
```

```
ZeroDivisionError: division by zero
```

In [78]:
```
import math
```

In [79]:
```
import sys
```

In [80]:
```
import math, sys
```

In [81]:
```
math.pi
```

Out[81]:
```
3.141592653589793
```

In [83]:
```
math.sin(2 * math.pi)
```

Out[83]:
```
-2.4492935982947064e-16
```

In [84]:
```
print(pi)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_10176/2493917274.py in <module>
----> 1 print(pi)

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

In [85]:
```
print(math.pi)
```

```
3.141592653589793
```

In [86]:
```
from math import pi, sin, cos, tan
```

In [87]:
```
print(pi)
```

```
3.141592653589793
```

In [88]:
```
print(math.pi)
```

```
3.141592653589793
```

In [89]:
```
from math import sin, pi
```

In [90]:
```
sin(pi / 2)
```

Out[90]:
```
1.0
```

In [ ]:
```
import math

print(math.pi)
```

In [91]:
```
from math import *

print(pi)
print(cos(pi / 2))

pi = 1

print(pi)
```

```
3.141592653589793
6.123233995736766e-17
1
```

In [92]:
```
def cos(x):
    return x * 2
```

In [93]:
```
print(cos(pi / 2))
```

```
1.0
```

In [94]:
```
import math

math.e
```

Out[94]:
```
2.718281828459045
```

In [95]:
```
import math as m

m.pi
```

Out[95]:
```
3.141592653589793
```

In [96]:
```
m.cos(m.pi)
```

Out[96]:
```
-1.0
```

In [97]:
```
from math import pi as phi
```

In [98]:
```
phi
```

Out[98]:
```
3.141592653589793
```

In [99]:
```
from math import sin as sinus
```

In [100…
```
sinus(1)
```

Out[100…
```
0.8414709848078965
```

In [ ]:
```
import numpy as np
import pandas as pd
```

```
import matplotlib.pyplot as plt

from sklearn.preprocessing import MinMaxScaler
```

In [101…

```
def make_money():
    print("Hahaha")
```

In [ ]:

```
import mint

mint.make_money()

make_money()
```

In [102…

```
import math
```

In [104…

```
def sin(x):
    return x

print("Function saya:", sin(1))
print("Dari modul math:", math.sin(1))
```

```
Function saya: 1
Dari modul math: 0.8414709848078965
```

In [105…

```
import math
```

In [106…

```
dir(math)
```

Out[106…

```
['__doc__',
 '__loader__',
 '__name__',
 '__package__',
 '__spec__',
 'acos',
 'acosh',
 'asin',
 'asinh',
 'atan',
 'atan2',
 'atanh',
 'ceil',
 'comb',
 'copysign',
 'cos',
 'cosh',
 'degrees',
 'dist',
 'e',
 'erf',
 'erfc',
 'exp',
 'expm1',
 'fabs',
 'factorial',
 'floor',
 'fmod',
```

```
 'frexp',
 'fsum',
 'gamma',
 'gcd',
 'hypot',
 'inf',
 'isclose',
 'isfinite',
 'isinf',
 'isnan',
 'isqrt',
 'lcm',
 'ldexp',
 'lgamma',
 'log',
 'log10',
 'log1p',
 'log2',
 'modf',
 'nan',
 'nextafter',
 'perm',
 'pi',
 'pow',
 'prod',
 'radians',
 'remainder',
 'sin',
 'sinh',
 'sqrt',
 'tan',
 'tanh',
 'tau',
 'trunc',
 'ulp']
```

In [107…
```
3 // 4
```

Out[107…
```
0
```

In [108…
```
5 // 2
```

Out[108…
```
2
```

In [109…
```
from math import ceil
```

In [110…
```
ceil(2.6)
```

Out[110…
```
3
```

In [111…
```
ceil(5 / 2)
```

Out[111…
```
3
```

In [112…
```
ceil(3 / 2)
```

Out[112… 2

In [ ]: