[1]:
```
print("hello")
```

```
hello
```

[2]:
```
a="hello world"
print(a)
```

```
hello world
```

1 User-inputs

[3]:
```
name=input("Enter Yout Name Here:")
print(name)
```

```
Enter Yout Name Here: abc
```

```
abc
```

[4]:
```
age = int(input("Enter your age:"))
print(age)
```

```
Enter your age: 21
```

```
21
```

[5]:
```
a= eval(input("Enter your age:"))
print(a)
```

```
Enter your age: 22
```

```
22
```

[6]:
```
name=input("Enter the name:")
print(type(name))
```

```
Enter the name: abc
```

```
<class 'str'>
```

2 Data Types

[7]:
```
x = "Hello World"
print(type(x))
```

```
<class 'str'>
```

[8]:
```
x = 20.5
print(type(x))
```

```
<class 'float'>
```

[9]:
```
x = 1j
print(type(x))
```

```
<class 'complex'>
```

[10]:
```
x = ["apple", "banana", "cherry"]
print(type(x))
```

```
<class 'list'>
```

[11]:
```
x = ("apple", "banana", "cherry")
print(type(x))
```

```
<class 'tuple'>
```

[12]:
```
x = {"name" : "John", "age" : 36}
print(type(x))
```

```
<class 'dict'>
```

[13]:
```
x = {"apple", "banana", "cherry"}
print(type(x))
```

```
<class 'set'>
```

[14]:
```
x = frozenset({"apple", "banana", "cherry"})
print(type(x))
```

```
<class 'frozenset'>
```

[15]:
```
x = b"Hello"
print(type(x))
```

```
<class 'bytes'>
```

[16]:
```
x = memoryview(bytes(5))
print(type(x))
```

```
<class 'memoryview'>
```

[17]:
```
x = 3+5j
y = 5j
z = -5j

print(type(x))
print(type(y))
print(type(z))
```

```
<class 'complex'>
<class 'complex'>
<class 'complex'>
```

[18]:
```
x = 35e3
y = 12E4
z = -87.7e100

print(type(x))
print(type(y))
print(type(z))
```

```
<class 'float'>
<class 'float'>
<class 'float'>
```

[19]:
```
x = 1    # int
y = 2.8  # float
z = 1j   # complex

#convert from int to float:
a = float(x)

#convert from float to int:
b = int(y)

#convert from int to complex:
c = complex(x)

print(a)
print(b)
print(c)

print(type(a))
print(type(b))
print(type(c))
```

```
1.0
2
(1+0j)
<class 'float'>
```

```
<class 'int'>
<class 'complex'>
```

[20]:
```
import random

print(random.randrange(1, 10))
```

```
7
```

3 Variable & operator

[24]:
```
# Variables in Python

first_name = 'abc'
country = 'Finland'
age = 250
skills = ['HTML', 'CSS', 'JS', 'React', 'Python']
person_info = {
    'firstname':'Asabeneh',
    'lastname':'Yetayeh',
    'country':'Finland',
    'city':'Helsinki'
    }


print('First name:', first_name)
print('Country: ', country)
print('Age: ', age)
print('Skills: ', skills)
print('Person information: ', person_info)

# Declaring multiple variables in one line

first_name, last_name, country, age= 'xyz', 'abc', 'Helsink', 250

print(first_name, last_name, country, age)
print('First name:', first_name)
print('Last name: ', last_name)
print('Country: ', country)
print('Age: ', age)
```

```
First name: abc
Country:  Finland
Age:  250
Skills:  ['HTML', 'CSS', 'JS', 'React', 'Python']
Person information:  {'firstname': 'Asabeneh', 'lastname': 'Yetayeh', 'country':
'Finland', 'city': 'Helsinki'}
xyz abc Helsink 250
```

```
First name: xyz
Last name:  abc
Country:  Helsink
Age:  250
```

[25]:
```python
# Arithmetic Operations in Python

print('Addition: ', 1 + 2)
print('Subtraction: ', 2 - 1)
print('Multiplication: ', 2 * 3)
print ('Division: ', 4 / 2)
print('Division without the remainder: ', 7 // 2)
print('Modulus: ', 3 % 2)                              # Gives the remainder
print('Exponential: ', 3 ** 2)                        # it means 3 * 3

# Floating numbers
print('Floating Number,PI', 3.14)
print('Floating Number, gravity', 9.81)

# Complex numbers
print('Complex number: ', 1 + 1j)
print('Multiplying complex number: ',(1 + 1j) * (1-1j))

# Declaring the variable at the top first

a = 3 # a is a variable name and 3 is an integer data type
b = 2 # b is a variable name and 3 is an integer data type

# Arithmetic operations and assigning the result to a variable
total = a + b
diff = a - b
product = a * b
division = a / b
remainder = a % b
floor_division = a // b
exponential = a ** b

print(total)
print('a + b = ', total)
print('a - b = ', diff)
print('a * b = ', product)
print('a / b = ', division)
print('a % b = ', remainder)
print('a // b = ', floor_division)
print('a ** b = ', exponential)
```

```
# Calculating area of a circle
radius = 10                                 # radius of a circle
area_of_circle = 3.14 * radius ** 2         # two * sign means exponent or power
print('Area of a circle:', area_of_circle)

# Calculating area of a rectangle
length = 10
width = 20
area_of_rectangle = length * width
print('Area of rectangle:', area_of_rectangle)


print(3 > 2)     # True, because 3 is greater than 2
print(3 >= 2)    # True, because 3 is greater than 2
print(3 < 2)     # False,  because 3 is greater than 2
print(2 < 3)     # True, because 2 is less than 3
print(2 <= 3)    # True, because 2 is less than 3
print(3 == 2)    # False, because 3 is not equal to 2
print(3 != 2)    # True, because 3 is not equal to 2

# Boolean comparison
print('True == True: ', True == True)
print('True == False: ', True == False)
print('False == False:', False == False)
print('True and True: ', True and True)
print('True or False:', True or False)
```

```
Addition:  3
Subtraction:  1
Multiplication:  6
Division:  2.0
Division without the remainder:  3
Modulus:  1
Exponential:  9
Floating Number,PI 3.14
Floating Number, gravity 9.81
Complex number:  (1+1j)
Multiplying complex number:  (2+0j)
5
a + b =  5
a - b =  1
a * b =  6
a / b =  1.5
a % b =  1
a // b =  1
a ** b =  9
Area of a circle: 314.0
```

```
Area of rectangle: 200
True
True
False
True
True
False
True
True == True:  True
True == False:  False
False == False: True
True and True:  True
True or False: True
```

[26]:
```python
#If Condition
a = 3
if a > 0:
    print('A is a positive number')

#If Else

a = 3
if a < 0:
    print('A is a negative number')
else:
    print('A is a positive number')
```

```
A is a positive number
A is a positive number
```

[27]:
```python
# If Elif Else

a = 0
if a > 0:
    print('A is a positive number')
elif a < 0:
    print('A is a negative number')
else:
    print('A is zero')
```

```
A is zero
```

[28]:
```python
# Short Hand

# syntax
#code if condition else code

a = 3
```

```
print('A is positive') if a > 0 else print('A is negative') # first condition␣
 ↪met, 'A is positive' will be printed
```

```
A is positive
```

[29]:
```
#Nested Conditions
a = 0
if a > 0:
    if a % 2 == 0:
        print('A is a positive and even integer')
    else:
        print('A is a positive number')
elif a == 0:
    print('A is zero')
else:
    print('A is a negative number')

# If Condition and Logical Operators

a = 0
if a > 0 and a % 2 == 0:
        print('A is an even and positive integer')
elif a > 0 and a % 2 !=  0:
     print('A is a positive integer')
elif a == 0:
    print('A is zero')
else:
    print('A is negative')
```

```
A is zero
A is zero
```

4 Loop

[30]:
```
count = 0
while count < 5:
    print(count)
    count = count + 1
#prints from 0 to 4

count = 0
while count < 5:
    print(count)
    count = count + 1
else:
    print(count)
```

```
0
```

```
1
2
3
4
0
1
2
3
4
5
```

[31]:
```
numbers = [0, 1, 2, 3, 4, 5]
for number in numbers:                #for loop
    print(number)

language = 'Python'
for letter in language:
    print(letter)


for i in range(len(language)):
    print(language[i])
```

```
0
1
2
3
4
5
P
y
t
h
o
n
P
y
t
h
o
n
```

[32]:
```
#For loop with dictionary.

person = {
    'first_name':'abc',
    'last_name':'xyz',
    'age':250,
```

```
    'country':'Finland',
    'is_marred':True,
    'skills':['JavaScript', 'React', 'Node', 'MongoDB', 'Python'],
    'address':{
        'street':'Space street',
        'zipcode':'02210'
    }
}
for key in person:
    print(key)

for key, value in person.items():
    print(key, value) # this way we get both keys and values printed out
```

```
first_name
last_name
age
country
is_marred
skills
address
first_name abc
last_name xyz
age 250
country Finland
is_marred True
skills ['JavaScript', 'React', 'Node', 'MongoDB', 'Python']
address {'street': 'Space street', 'zipcode': '02210'}
```

[33]:
```
#Loops in set

it_companies = {'Facebook', 'Google', 'Microsoft', 'Apple', 'IBM', 'Oracle',␣
 ↪'Amazon'}
for company in it_companies:
    print(company)
```

```
Oracle
Microsoft
Amazon
IBM
Facebook
Apple
Google
```

[34]:
```
#Break and Continue
count = 0
while count < 5:
    print(count)
```

```
    count = count + 1
    if count == 3:
        break


count = 0
while count < 5:
    if count == 3:
        count = count + 1
        continue
    print(count)
    count = count + 1

numbers = (0,1,2,3,4,5)
for number in numbers:
    print(number)
    if number == 3:
        break
```

```
0
1
2
0
1
2
4
0
1
2
3
```

[35]:
```
#range Function
lst = list(range(11))
print(lst)

st = set(range(1, 11))
print(st) # {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

lst = list(range(0,11,2))
print(lst) # [0, 2, 4, 6, 8, 10]

for number in range(11):
    print(number)   # prints 0 to 10, not including 11
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
[0, 2, 4, 6, 8, 10]
```

```
0
1
2
3
4
5
6
7
8
9
10
```

[36]:
```
for i in range(1,6):
   for j in range(i):
       print(" * ", end = "")
   print( )
```

```
 *
 *  *
 *  *  *
 *  *  *  *
 *  *  *  *  *
```

[37]:
```
for i in range(5,0,-1):
    for j in range(i):
        print(" * ", end = "")
    print( )
```

```
 *  *  *  *  *
 *  *  *  *
 *  *  *
 *  *
 *
```

[38]:
```
for i in range(1, 6):
   for j in range(1, i+1):
       print(j, end = " ")
   print()
```

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

[39]:
```
for i in range(5, 0, -1):
   for j in range(i):
       print(i, end = " ")
   print()
```

```
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
```

[40]:
```
for i in range(5):
   for j in range(5-i-1):
     print(" ",end=" ")
   for j in range(i+1):
     print(j+1, end=" ")
   print()
```

```
        1
      1 2
    1 2 3
  1 2 3 4
1 2 3 4 5
```

[41]:
```
for i in range(5):
   for j in range(5-i-1):
     print(" ",end=" ")
   for j in range(i+1):
     print(i+1, end=" ")
   print()
```

```
        1
      2 2
    3 3 3
  4 4 4 4
5 5 5 5 5
```

[42]:
```
for i in range(1, 6):
   for j in range(i, 0, -1):
        print(j, end = " ")
   print()
```

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
```