Logical Operations

x	y	x and y	x or y	not x
True	True	True	True	False
True	False	False	True	False
False	True	False	True	True
False	False	False	False	True

In [3]:

```
print(t)
print(f)
print(t or f)
print(t and f)
print(not t)     # not: True if operand is false (complements the operand)
print(t != f)  # != not equal
print(t==f)  # equal
```

```
True
False
True
False
False
True
False
```

len()

In [4]:

```
hello = 'Hello'
world = "World"
```

In [5]:

```
print(hello)
```

```
Hello
```

In [6]:

```
print(len(hello))
print(world + "      " + str(len(world)) + "\n" + "Hello")
```

```
5
World      5
Hello
```

In [7]:

```
world2 = '%s %d' % (world, len(world))
print(world2)
```

```
World 5
```

In [8]:

```
print(world, len(world))
```

```
World 5
```

Type Conversion

- **str()**
- **float()**
- **int()**

In [12]:

```
print(world + str(len(world)))

print(world + " " + str(len(world)))
```

```
World5
World 5
```

In [13]:

```
str("Python")
```

Out[13]:

```
'Python'
```

In [14]:

```
float(5)
```

Out[14]:

```
5.0
```

In [18]:

```
type(5.0)
```

Out[18]:

```
float
```

In [19]:

```
int(float(5.7))
```

Out[19]:

```
5
```

In [20]:

```
float("6.2")
```

Out[20]:

```
6.2
```

In [21]:

```
float("Hello")
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-21-ff6885467a56> in <module>
----> 1 float("Hello")
```

```
ValueError: could not convert string to float: 'Hello'
```

In [24]:

```
int(5.5)
```

Out[24]:

```
5
```

Indexing and Slicing

In [36]:

```
hello = "Hello"
print(hello)
print(hello[0])
print(hello[1])
print(hello[2])
print(hello[3])
print(hello[4])
```

```
Hello
H
e
l
l
o
```

In [40]:

```
hello2 = " Hello"
hello2[0]
```

Out[40]:

```
' '
```

In [42]:

```
hello
```

Out[42]:

```
'Hello'
```

In [46]:

```
print(hello[5])
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
<ipython-input-46-d8090546c4b7> in <module>
----> 1 print(hello[5])

IndexError: string index out of range
```

In [49]:

```
print(world)
print(world[-1])
print(world[-3])
print(world[-5])
```

```
World
d
r
W
```

In [50]:

In [50]:

```
world[-6]
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
<ipython-input-50-957f0f60f0cb> in <module>
----> 1 world[-6]

IndexError: string index out of range
```

In [33]:

```
job = " Engineering"

print(job[-5])
```

```
e
```

In [29]:

```
print(hello)
```

```
Hello
```

In [56]:

```
hello
```

Out[56]:

```
'Hello'
```

In [32]:

```
hello[2:4]  # [x:y] --> take the values from x th to y th but don't take y th value.
```

Out[32]:

```
'll'
```

In [57]:

```
world
```

Out[57]:

```
'World'
```

In [34]:

```
world[1:4]
```

Out[34]:

```
'orl'
```

In [65]:

```
print(world[3:5])

print(world[3:])
```

```
ld
ld
```

In [60]:

```
hello[:4]
```

Out[60]:

```
'Hell'
```

In [61]:

```
hello[:]
```

Out[61]:

```
'Hello'
```

In [62]:

```
hello[::-1]
```

Out[62]:

```
'olleH'
```

In [70]:

```
world
```

Out[70]:

```
'World'
```

In [39]:

```
world[:-3]
```

Out[39]:

```
'Wo'
```

In [71]:

```
len(world)
```

Out[71]:

```
5
```

In [72]:

```
hello
```

Out[72]:

```
'Hello'
```

In [74]:

```
hello[2:len(world)]
```

Out[74]:

```
'llo'
```

In [76]:

```
world[2:4:1]   # [start:end:step]
```

Out[76]:

```
'rl'
```

In [78]:

```
city = "istanbul"
city[0:6:2]
```

Out[78]:

```
'itn'
```

In [56]:

```
"t" in city
```

"t" in city

Out[56]:

True

In [57]:

```
"y" in city
```

Out[57]:

False

In [79]:

```
"anb" in city
```

Out[79]:

True

In [80]:

```
"snl" in city
```

Out[80]:

False

In [81]:

```
n = 10
str(n)
```

Out[81]:

'10'

In [82]:

```
s = '13'
s
int(s)
```

Out[82]:

13

In [83]:

```
s = 'ist'
int(s)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-83-5289cffa7745> in <module>
      1 s = 'ist'
----> 2 int(s)

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

In [84]:

```
m = 8
print(float(m), m)
m
```

8.0 8

Out[84]:

8

In [85]:

```
ai = 'artificial' + ' ' + 'intelligence'
print(ai)
```

```
artificial intelligence
```

In [86]:

```
word = 'machine learning'
print(word.capitalize())
```

```
Machine learning
```

In [87]:

```
print(word.upper())
```

```
MACHINE LEARNING
```

In [89]:

```
print(word.replace('machine','artificial'))
```

```
artificial learning
```

In [90]:

```
word
```

Out[90]:

```
'machine learning'
```

In [92]:

```
word2 = "          artificial general      intelligence"
print(word2.strip())
```

```
artificial general      intelligence
```

In [2]:

```
y = input("Please enter a city name: ")  #input method always takes string type.
print(y)
```

```
Please enter a city name: 555
555
```

In [3]:

```
type(y)
```

Out[3]:

```
str
```

In [7]:

```
x = int(input("Please enter an integer: "))
print(x)
```

```
Please enter an integer: 4.3

---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-7-614cd690396c> in <module>
----> 1 x = int(input("Please enter an integer: "))
      2 print(x)

ValueError: invalid literal for int() with base 10: '4.3'
```

In [5]:

```
type(x)
```

Out[5]:

```
int
```

In [10]:

```
month = 12
day = 365

print('One year is ', month, 'months, and ', day, 'days.', sep =' ')
print('One year is  ', month, ' months, and  ', day, ' days.', sep ='')

print("One year is " + str(month) + " months, and " + str(day) + " days.")
```

```
One year is  12 months, and  365 days.
One year is  12 months, and  365 days.
One year is 12 months, and 365 days.
```

Question:

Create a program will compute the tax and the tip for a meal ordered at a restaurant. You can compute the tax as 8 percent of the meal amount and the tip as 10 percent of the meal amount (without the tax). The output from your program should include the tax amount, the tip amount, and the grand total for the meal including both the tax and the tip.

a)Define the cost of the meal in the beginning of your program.

Some several example program runs:

Cost of the meal is 25 Eur.

Sample Run: The tax is 2.00 Eur and the tip is 2.50 Eur, making the total 29.50 Eur.

Cost of the meal is 68 Eur.

Sample Run: The tax is 5.44 Eur and the tip is 6.80000000000001 Eur, making the total 80.24 Eur.

b)Input the cost of the meal from the user.

Some several example program runs:

Please enter the cost of your meal: 100

Sample Run: The tax is 8.00 Eur and the tip is 10.00 Eur, making the total 118.00 Eur.

Please enter the cost of your meal: 68

Sample Run: The tax is 5.44 Eur and the tip is 6.80 Eur, making the total 80.24 Eur.

Answer

In [10]:

```
# a)Define the cost of the meal in the beginning of your program.

cost = 79
tax = cost * 0.08
tip = cost * 0.1
total = cost + tax + tip



print("The tax is " + str(tax) + " Eur and the tip is " + str(tip) + " Eur, making the to
tal " + format(total, ".2f") + " Eur.")
```

```
print("The tax is " + format(tax, ".2f") + " Eur and the tip is " + format(tip, ".2f") +
" Eur, making the total " + format(total, ".2f") + " Eur")
```

```
The tax is 6.32 Eur and the tip is 7.9 Eur, making the total 93.22 Eur.
The tax is 6.32 Eur and the tip is 7.90 Eur, making the total 93.22 Eur
```

In [12]:

```
#b)Input the cost of the meal from the user.

cost = float(input("Please enter the cost of your meal: "))
tax = cost * 0.08
tip = cost * 0.1
total = cost + tax + tip


print("The tax is " + str(tax) + " Eur and the tip is " + str(tip) + " Eur, making the to
tal " + format(total, ".2f") + " Eur")
```

```
Please enter the cost of your meal: 45
The tax is 3.6 Eur and the tip is 4.5 Eur, making the total 53.10 Eur
```