Notes Python

https://www.tutorialspoint.com/python3/index.htm

Bases

```
#!/usr/bin/python3

# output
print ("Hello, Python!")
print(x, end=" ")  # Appends a space instead of a newline in
Python 3

# input
x = input("something:")

# raise exception
raise IOError("file error") #this is the recommended syntax
in Python 3
```

```
# Quotation in Python
word = 'word'
sentence = "This is a sentence."
paragraph = """This is a paragraph. It is
made up of multiple lines and sentences."""
```

Variable Types

```
# Simple Assignment
counter = 100          # An integer assignment
miles   = 1000.0       # A floating point
value   = 3e+26J       # A complex
name    = "John"       # A string

# Multiple Assignment
a = b = c = 1
```

```
a, b, c = 1, 2, "john"

# deletion
a, b, c = 1, 2, "john"
```

```
str = 'Hello World!'

print (str)          # Prints complete string
print (str[0])       # Prints first character of the string
print (str[2:5])     # Prints characters starting from 3rd
to 5th
print (str[2:])      # Prints string starting from 3rd
character
print (str * 2)      # Prints string two times
print (str + "TEST") # Prints concatenated string
```

```
list = [ 'abcd', 786 , 2.23, 'john', 70.2 ]
tinylist = [123, 'john']

print (list)          # Prints complete list
print (list[0])       # Prints first element of the list
print (list[1:3])     # Prints elements starting from 2nd
till 3rd
print (list[2:])      # Prints elements starting from 3rd
element
print (tinylist * 2)  # Prints list two times
print (list + tinylist) # Prints concatenated lists
```

```
tuple = ( 'abcd', 786 , 2.23, 'john', 70.2  )
tinytuple = (123, 'john')

print (tuple)           # Prints complete tuple
print (tuple[0])        # Prints first element of the tuple
print (tuple[1:3])      # Prints elements starting from 2nd
till 3rd
print (tuple[2:])       # Prints elements starting from 3rd
element
print (tinytuple * 2)   # Prints tuple two times
print (tuple + tinytuple) # Prints concatenated tuple
```

```
dict = {}
```

```
dict['one'] = "This is one"
dict[2]     = "This is two"

tinydict = {'name': 'john','code':6734, 'dept': 'sales'}

print (dict['one'])       # Prints value for 'one' key
print (dict[2])           # Prints value for 2 key
print (tinydict)          # Prints complete dictionary
print (tinydict.keys())   # Prints all the keys
print (tinydict.values()) # Prints all the values
```

```
#Data Type Conversion
int(x [,base]) #Converts x to an integer. The base specifies
the base if x is a string.
float(x) # Converts x to a floating-point number.
complex(real [,imag]) # Creates a complex number.
str(x) # Converts object x to a string representation.
repr(x) # Converts object x to an expression string.
eval(str) # Evaluates a string and returns an object.
tuple(s) # Converts s to a tuple.
list(s) # Converts s to a list.
set(s) # Converts s to a set.
dict(d) # Creates a dictionary. d must be a sequence of
(key,value) tuples.
frozenset(s) # Converts s to a frozen set.
chr(x) # Converts an integer to a character.
unichr(x) # Converts an integer to a Unicode character.
ord(x) # Converts a single character to its integer value.
hex(x) # Converts an integer to a hexadecimal string.
oct(x) # Converts an integer to an octal string.
```

Basic Operators

```
# Python Arithmetic Operators
c = a % b  # Modulus
c = a ** b # Exponent
c = a // b # Floor Division

# Python Membership Operators
x in y
```

```
x not in y

# Python Identity Operators
x is y
x is not y
```

Decision Making

```
# if statement
if expression:
   statement(s)

# if else statement
if expression:
   statement(s)
else:
   statement(s)

# nested if statements
if expression1:
   statement(s)
elif expression:
   statement(s)
else:
   statement(s)

# Single Statement if
if ( var  == 100 ) : print ("Value of expression is 100")
```

Decision Making

```
# while loop
while expression:
   statement(s)

while count < 5:
   count = count + 1
else:
```

```
   print (count, " is not less than 5")


# for loop
for iterating_var in sequence:
   statements(s)

>>> range(5)
range(0, 5)
>>> list(range(5))
[0, 1, 2, 3, 4]

fruits = ['banana', 'apple',  'mango']
for index in range(len(fruits)):
   print ('Current fruit :', fruits[index])

for num in numbers:
   if num%2 == 0:
      print ('the list contains an even number')
      break
else:
   print ('the list doesnot contain even number')

# Loop Control Statements
break
continue
pass
```

```
# Iterators
list = [1,2,3,4]
it = iter(list) # this builds an iterator object
print (next(it)) #prints next available element in iterator

# Iterator object can be traversed using regular for
statement
for x in it:
   print (x, end=" ")

# or using next() function
while True:
   try:
      print (next(it))
```

```
   except StopIteration:
      sys.exit() #you have to import sys module for this
```

```
# Generators

import sys
def fibonacci(n): #generator function
   a, b, counter = 0, 1, 0
   while True:
      if (counter > n):
         return
      yield a
      a, b = b, a + b
      counter += 1
f = fibonacci(5) #f is iterator object

while True:
   try:
      print (next(f), end=" ")
   except StopIteration:
      sys.exit()
```

Numbers

```
number = 1 # int
number = 1.2 # float
number = -32.54e100
number = 1 + 2J #complex
number = 0xA0F #Hexa-decimal = 2575
number = 0o37 #Octal = 31

# Number Type Conversion
int(x)
long(x)
float(x)
complex(x)
complex(x, y)

# Mathematical Functions
abs(x)
```

```
ceil(x)
cmp(x, y) # Deprecated
exp(x)
fabs(x)
floor(x)
log(x)
log10(x)
max(x1, x2,...)
min(x1, x2,...)
modf(x)
pow(x, y)
round(x [,n])
sqrt(x)

# Random Number Functions
choice(seq)
randrange ([start,] stop [,step])
random()
seed([x])
shuffle(lst)
uniform(x, y)

# Trigonometric Functions
acos(x)
asin(x)
atan(x)
atan2(y, x)
cos(x)
hypot(x, y)
sin(x)
tan(x)
degrees(x)
radians(x)

# Mathematical Constants
pi
e
```

Strings

```
var1 = 'Hello World!'
var2 = "Python Programming"

# substrings
var1[0]
var2[1:5]

# String Special Operators
a + b
a * n
a[n] # slice
a[n:m] # range slice
a in b
a in not b
r'...' # raw string
R'...' # raw string

# String Formatting Operator
print ("My name is %s and weight is %d kg!" % ('Zara', 21))

%c character
%s string conversion via str() prior to formatting
%i signed decimal integer
%d signed decimal integer
%u unsigned decimal integer
%o octal integer
%x hexadecimal integer (lowercase letters)
%X hexadecimal integer (UPPERcase letters)
%e exponential notation (with lowercase 'e')
%E exponential notation (with UPPERcase 'E')
%f floating point real number
%g the shorter of %f and %e
%G the shorter of %f and %E

*     argument specifies width or precision
-     left justification
+     display the sign
<sp>  leave a blank space before a positive number
#     add the octal leading zero ( '0' ) or hexadecimal
leading '0x' or '0X',
      depending on whether 'x' or 'X' were used.
```

```
0     pad from left with zeros (instead of spaces)
%     '%%' leaves you with a single literal '%'
(var) mapping variable (dictionary arguments)
m.n.  m is the minimum total width and n is the number of
digits to display
      after the decimal point (if appl.)

# Triple Quotes
para_str = """this is a long string that is made up of
several lines and non-printable characters such as
TAB ( \t ) and they will show up that way when displayed.
the variable assignment will also show up.
"""

# Unicode String
capitalize()
center(width, fillchar)
count(str, beg = 0,end = len(string))
decode(encoding = 'UTF-8', errors = 'strict')
encode(encoding = 'UTF-8', errors = 'strict')
endswith(suffix, beg = 0, end = len(string))
expandtabs(tabsize = 8)
find(str, beg = 0 end = len(string))
index(str, beg = 0, end = len(string))
isalnum()
isalpha()
isdigit()
islower()
isnumeric()
isspace()
istitle()
isupper()
join(seq)
len(string)
ljust(width[, fillchar])
lower()
lstrip()
maketrans()
max(str)
min(str)
replace(old, new [, max])
rfind(str, beg = 0,end = len(string))
```

```
rindex( str, beg = 0, end = len(string))
rjust(width,[, fillchar])
rstrip()
split(str="", num=string.count(str))
splitlines( num=string.count('\n'))
startswith(str, beg=0,end=len(string))
strip([chars])
swapcase()
title()
translate(table, deletechars="")
upper()
zfill (width)
isdecimal()
```

Object Oriented

```
```

```
#!/usr/bin/python

class Employee:
   'Common base class for all employees'
   empCount = 0

   def __init__(self, name, salary):
      self.name = name
      self.salary = salary
      Employee.empCount += 1

   def displayCount(self):
     print "Total Employee %d" % Employee.empCount

   def displayEmployee(self):
      print "Name : ", self.name,  ", Salary: ", self.salary

"This would create first object of Employee class"
emp1 = Employee("Zara", 2000)
"This would create second object of Employee class"
emp2 = Employee("Manni", 5000)
emp1.displayEmployee()
```

```
emp2.displayEmployee()
print "Total Employee %d" % Employee.empCount
```

```
# Built-In Class Attributes
print "Employee.__doc__:", Employee.__doc__
print "Employee.__name__:", Employee.__name__
print "Employee.__module__:", Employee.__module__
print "Employee.__bases__:", Employee.__bases__
print "Employee.__dict__:", Employee.__dict__
```

```
# Class Inheritance
class Parent:        # define parent class
   parentAttr = 100
   def __init__(self):
      print "Calling parent constructor"

   def parentMethod(self):
      print 'Calling parent method'

   def setAttr(self, attr):
      Parent.parentAttr = attr

   def getAttr(self):
      print "Parent attribute :", Parent.parentAttr

class Child(Parent): # define child class
   def __init__(self):
      print "Calling child constructor"

   def childMethod(self):
      print 'Calling child method'

c = Child()          # instance of child
c.childMethod()      # child calls its method
c.parentMethod()     # calls parent's method
c.setAttr(200)       # again call parent's method
c.getAttr()          # again call parent's method
```

```
# Overriding Methods
class Parent:        # define parent class
   def myMethod(self):
```

```
      print 'Calling parent method'

class Child(Parent): # define child class
   def myMethod(self):
      print 'Calling child method'

c = Child()          # instance of child
c.myMethod()         # child calls overridden method
```