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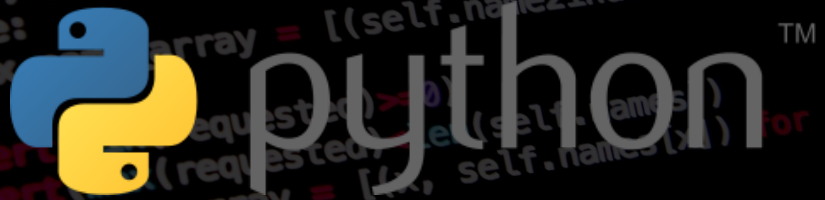
# <Welcome To>



# 1.

## Overall Program Content

| Web development with Python | Hours |
|---|---|
| Work skills development | 50 |
| Python Programming Introduction | 150 |
| Web Programming Introduction (html/css) | 100 |
| Databases Concepts and Structures | 50 |
| Web Servers Programming | 150 |
| Web services development | 150 |
| Total | 650 |

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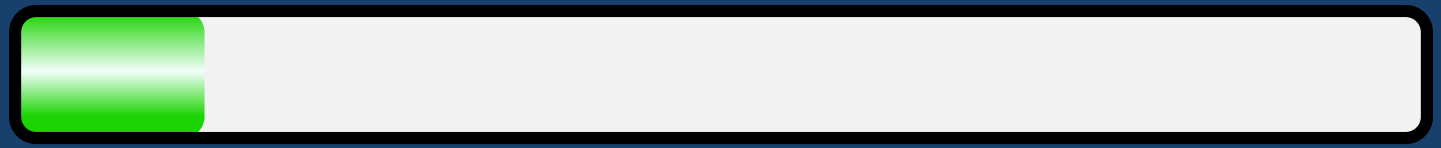
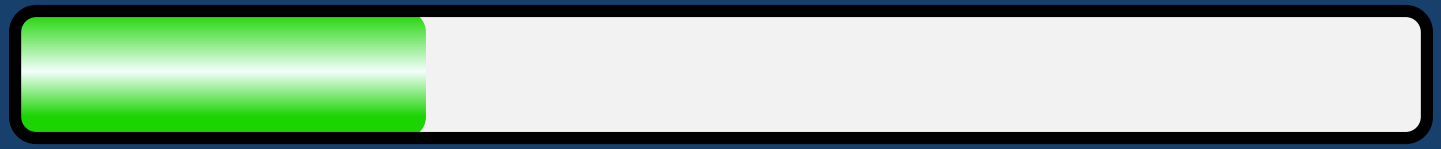
# Python programming Introduction Content

1. Course Introduction
- Why Python?
- Python Applications
- Installation Tools
- Building your code catalog
- Useful websites



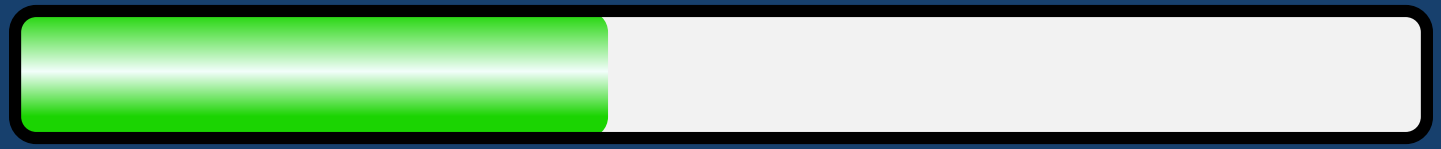
# Python programming Introduction Content

2. Data types/outputs/inputs
3. Operators
4. Functions and Modules



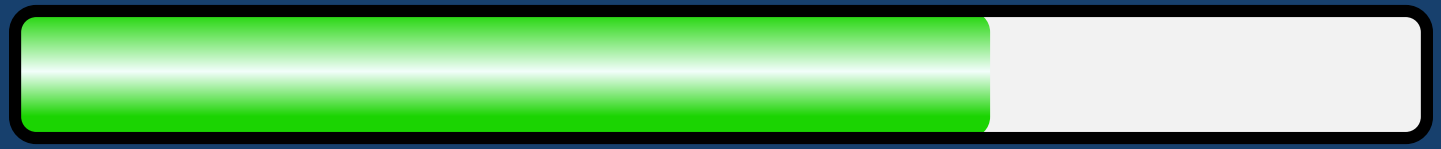
# Python programming Introduction Content

5. Conditional statements and expression
6. Loops
7. Work with standard Library and Modules



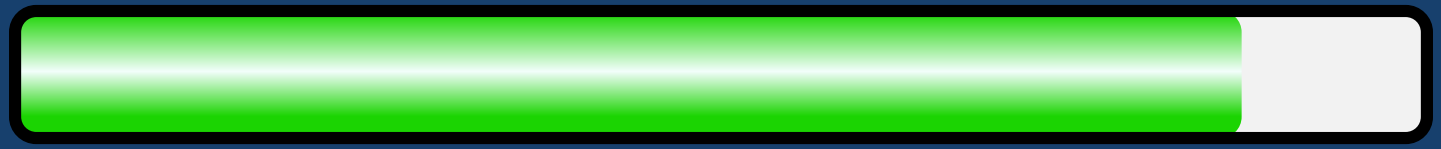
# Python programming Introduction Content

8. Data structure in python
9. List,
10. Tuple,
11. Dictionaries,
12. Set



# Python programming Introduction Content

13. Files
14. Functions and Modules
15. Classes
16. Introduction to Numpy
17. Introduction to Pandas

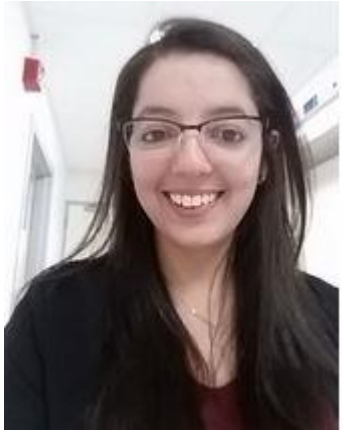


# Python programming Introduction Content

18. Introduction to matplotlib for data visualization
19. Data Preprocessing

**100% Loaded**

## Our Teachers:



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# Schedule

| Days/modules | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12-Oct | Joseanne | | | | | | | | | | | | | | | | | | |
| 2 | 13-Oct | | | | | | | | | | | | | | | | | | | |
| 3 | 14-Oct | | | | | | | | | | | | | | | | | | | |
| 4 | 15-Oct | | | | | | | | | | | | | | | | | | | |
| 5 | 16-Oct | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 6 | 19-Oct | | | | | | Hamed | | | | | | | | | | | | | |
| 7 | 20-Oct | | | | | | | | | | | | | | | | | | | |
| 8 | 21-Oct | | | | | | | | | | | | | | | | | | | |
| 9 | 22-Oct | | | | | | | | | | | | | | | | | | | |
| 10 | 23-Oct | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 11 | 26-Oct | | | | | | | | | | | | | | | | | | | |
| 12 | 27-Oct | | | | | | | | | | | | Stefan | | | | | | | |
| 13 | 28-Oct | | | | | | | | | | | | | | | | | | | |
| 14 | 29-Oct | | | | | | | | | | | | | | | | | | | |
| 15 | 30-Oct | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 16 | 2-Nov | | | | | | | | | | | | | | | Joseanne | | | | |
| 17 | 3-Nov | | | | | | | | | | | | | | | | | | | |
| 18 | 4-Nov | | | | | | | | | | | | | | | | | | | |
| 19 | 5-Nov | | | | | | | | | | | | | | | | | | | |
| 20 | 6-Nov | | | | | | | | | | | | | | | | | Hamed | | |
| | | | | | | | | | | | | | | | | | | | | |
| 21 | 9-Nov | | | | | | | | | | | | | | | | | | | |


<Let’s get started >

# Contents



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# Tuple

# Define tuple

*use [ ] to define a list*
*use ( ) to define a tuple*

```
t = ('English', 'History', 'Mathematics')

print(t)

print(type(t))    # <class 'tuple'>

print(len(t))     # 3
```

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# Define tuple

*To define a tuple with single obj we should use ',' after that obj*

```
t1 = (3)          # t1 is integer
t2 = (3,)         # t2 is tuple
s1 = ('a')        # s1 is string
s2 = ('a',)       # s2 is tuple
```

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## Access members
## Index
## Slicing

*access the members in tuple we use [ ], same as list*

```
t = ('English', 'History', 'Mathematics')

print(t[0])        # English

print(t[1:3])      # ('History', 'Mathematics')

print(t.index('English'))   # 0

print( 'English' in t)       # True
```

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# Access members

*tuples are immutable, same as strings*

```
t = ('English', 'History', 'Mathematics')

t[0] = 'art'  # Error

for i in t:
    print(f'I like to read {i}')
'''
I like to read English
I like to read History
I like to read Mathematics
'''
```

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# Review

## ‘i in a’

## ‘if’ vs ‘for’

```
"""
what is different of

' i in a '

when we use it in 'for' and 'if' ?

"""
a = (1, 2, 3)

if i in a:
# that means check this compares:
if ( i == a[0] or i == a[1] or i == a[2] ) :
    ...

for i in a:
    # that means for every loop run do these assignment:
    i = a[0]   for first run
    i = a[1]   for second run
    i = a[2]   for third run
    ...
```

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**Max**
**Min**
**Sum**
**Count**

```
t = (1, 9 , 2)

print(sum(t))        # 12

print(max(t))        # 9

print(min(t))        # 1

print(t.count(9))    # 1
```

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+ *
reversed

## * , + on tuples

```
t = (1, 9 , 2)

print(t*2)          # (1, 9, 2, 1, 9, 2)

print(t + t + t)    # (1, 9, 2, 1, 9, 2, 1, 9, 2)

print((3, 6) + (9,))     # (3, 6, 9)
print((1, 2) + (9, 6))   # (1, 2, 9, 6)
```

## Reversed()

```
print(tuple(reversed(t)))   # (2, 9, 1)
```

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# Ordered

*tuples are ordered*

```
t1 = (1,2)

t2 = (2,1)

print(t1 == t2)    # False
```

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# Append

*tuples are not changeable*
*Here we overwrite t with new value!*

```
t = (4 , 6)

t = t + (9,)

print(t)        # (4, 6, 9)
```

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# <Exercise 1>

# Exercise

Try append tuple with another way!
By Converting tuple to another data type

Input: t = (4 ,6)
Output: t be (4, 6, 9)

What is my Input ? It is tuple
How to convert Tuple ➔ list ?
What should I use to Add/append/extend to a list?
How I can convert List ➔ tuple ?

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## Exercise

## How to solve a Problem by splitting to small questions?

```
"""
Input:  t = (4 ,6)
Output:     t be (4, 6, 9)

What is my Input ? It is tuple
How to convert Tuple ==> list ? list()
What should I use to Add/append/extend  to a list?
How I can convert List ==> tuple ? tuple()

"""
t = (4 ,6)
a = list(t)

print("what is the value of a? ", a)

a.extend([9])  # a.append(9)
t = tuple(a)
```

Check what happen to ‘a’ until this line

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## Exercise solution

*Try append tuple with another way!*
*By Converting tuple to another data type*

*Input:* t = (4 ,6)
*Output:* t be (4, 6, 9)

```
t = (4 ,6)

a = list(t)

a.append(9)

t = tuple(a)

print(t)     # (4, 6, 9)
```

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# <Exercise 2>

# Exercise

Try change string?

you need to Convert string to another data type then overwrite it with new value!

1-Remove '$', '#' and spaces in t

2-Add space between 'Python' and 'Course'

Input: t = "$ $ Python$#Course $"

Output: t = "Python Course"

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## How to solve a Problem by splitting to small questions(Parts)?

```
"""
1-Remove ‘$’, ‘#’ and spaces in t
2-Add space between ‘Python’ and ‘Course’

Input:  t = “$ $ Python$#Course  $”
Output:     t = “Python Course”

1 - what is my input? string, unchangeable
2 - Remove ‘$’, ‘#’ and spaces?
    is there any method to do that? yes, t.strip('# $')
3 - is it solved? I need to remove '#$' from the middle of
    string! ==> convert string to list by list()
4 - I need a loop to check all list members and remove unwanted members
    I found there is no need to strip() and developed my code!
5 - I need to insert space between "n" and "C"


"""
```

# Exercise Solution 1

```python
t = "$ $ Python$#Course  $"
#a = t.strip('# $')
a = list(t)
b = a.copy()
for i in a:
    # i in ["#", "$", "\n", "\t", " "]
    if i == "#" or i == "$" or i == " " :
        b.remove(i)

C_index = b.index("C")
b.insert(C_index, " ")  # b.insert(b.index("C"), " ")

t = ''.join(b)
```

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# Exercise Solution 2

```python
t = "$ $ Python$#Course  $"

# remove '#' and '$' from the first and end of t
a = list(t.strip("# $"))     # remove '#', '$' and spaces

b = a.copy()

# remove '#' and '$' from the middle of t
for i in a:
    if i == "#" :
        b.remove("#")
    if i == "$" :
        b.remove("$")

# add space between 'Python' and 'Course'
b.insert( b.index("C") , " " )

# convert List to String
t = ''.join(b)
```

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# Remove

*Remove a members from tuple only possible by converting to another data type!*

```
t = (4, 7, 2, 9, 8)

x = list(t)

x.remove(2)

t = tuple(x)

print(t)      # (4, 7, 9, 8)
```

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# unpack

## Example 1

```
t = (4, 8)
a, b = t
print(a)    # 4
print(b)    # 8
```

## Example 2

```
car = ('blue', 'auto', 7)
color, _, a = car
print(color)     # blue
print(_)         # auto
print(a)         # 7
```

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# Zip
# Zip ( * )

## zip, zip(*)

```
a = (1, 2)
b = (3, 4)
c = zip(a,b)
x = list(c)
print(x)              # [(1, 3), (2, 4)]
print(x[0])           # (1,3)
print(type(x[0]))     # <class 'tuple'>
```

## z can be tuple or list

```
z = ((1, 3), (2, 4))   #OR z = [(1, 3), (2, 4)]
u = zip(*z)
print(list(u))            # [(1, 2), (3, 4)]
```

*Try this example*
*when z is a dictionary!*
*what is output?*

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# Zip
# Zip ( * )
# Example

## Example 1

You can use tuple or list

```
a = (1, 2 , 'A')        # a = [1, 2 , 'A']
b = (3, 4 , 8)          # b = [3, 4 , 8]
c = zip(a,b)
x = list(c)
print(x)                # [(1, 3), (2, 4), ('A', 8)]

print(list(zip(*x))) # [(1, 2, 'A'), (3, 4, 8)]
```

*minimum length between 'a' and 'range(2)' is 2*

```
a = [11, 22, 33]
b = zip(a, range(2))
print(list(b))          # [(11, 0),(22, 1)]
```

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# <Exercise 3>

# Exercise

Try Zip with 3 input variables?

```
A = [1, 2, 'A']
B = ('Python', 161·8, 0, 5)
C = {10, 12, 14, 16, 18, 20}
```

Output ==> print(list(zip(A, B, C)))

```
[(1, 'Python', 10), (2, 161·8, 12), ('A', 0, 14)]
```

Write program with the same input and output without using Zip() function?

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# Exercise Solution Step by step

```python
A = [1, 2, "A"]
B = ("Python", 161.8, 0, 5)
C = {10, 12, 14, 16, 18, 20}

# print(list(zip(A, B, C)))
# output :
# [(1, 'Python', 10), (2, 161.8, 12), ('A', 0, 14)]

min_ABC = min(len(A), len(B), len(C))
C = list(C)

i = 0
# step1: change output for better understanding
d1 = [(A[0], B[0], C[0]), (A[1], B[1], C[1]), (A[2], B[2], C[2])]
# step2: change indexes with i
d2 = [(A[i], B[i], C[i]),
      (A[i + 1], B[i + 1], C[i + 1]),
      (A[i + 2], B[i + 2], C[i + 2])]
# step3: its like a loop with 'i' itteration
e = []
for i in range(min_ABC):
    my_tuple = (A[i], B[i], C[i])
    e.append(my_tuple)

output = e
print(output)
```

Hint: C is a set type and is not ordered
That means each time you run the code,
The order of C items maybe changed!
This example with set is just for practicing!

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# isinstance

*how many tuples are in 'num' list*

```
num = [8, 2 , (9,3) , 4 , (1,6,7) , 34]
c = 0
for i in num:
    if isinstance(i , tuple):
        continue
    c += 1
print(c)                    # 4
print(len(num) - c)         # 2
```

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# <Exercise 4>

# Exercise

*how many tuples are in 'num' list*

*Try this example again*
*without using 'isinstance()' function?*

```
num = [8, 2 , (9,3) , 4 , (1,6,7) , 34]
```

# Exercise Solution

```
"""
How many tuples are in Num?
"""

Num = [8, 2, (9, 3), 4, (1, 6, 7), 34]

c = 0
for i in Num:
    if type(i) == tuple:
        c += 1
print("There are ", c, "tuples in Num")
```

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# Example

*Input : [(1,2,3) , (4,5,6)]*
*Output : [(1,2,9) , (4,5,9)]*

```
a = [(1,2,3) , (4,5,6)]

b = [i[:-1]+(9,) for i in a]

print(b)    # [(1, 2, 9), (4, 5, 9)]
```

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# <Homework 1>

# Homework 1

Input : [(1,2,3) , (4,5,6)]
Output : [(1,2,9) , (4,5,9)]

Try last example again with another way?

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# <Homework 2>

# Homework 2

By using unpacking method define my_obj to avoid raising error?

```
my_obj = ...
for i, j in my_obj :
        print("i is: ", i)
        print("j is: ", j)
```

When can we use "for i, j in my_obj"?

For example by defining my_obj = (1, 3)

We get this Error:

```
TypeError: cannot unpack non-iterable int object
```

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# <Homework 3>

# Homework 3

Input [(1, 3), (2, 4), ('A', 8)]

Output [(1, 2, 'A'), (3, 4, 8)]

Do Not use zip() function

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“

- *Make it work*
- *Make it Right*
- *Make it Fast*

# O futuro profissional começa aqui

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