
iscte
INSTITUTO
UNIVERSITÁRIO
DE LISBOA
emprego
digital
UPskill


<Welcome To>
python™

1.

Overall Program Content

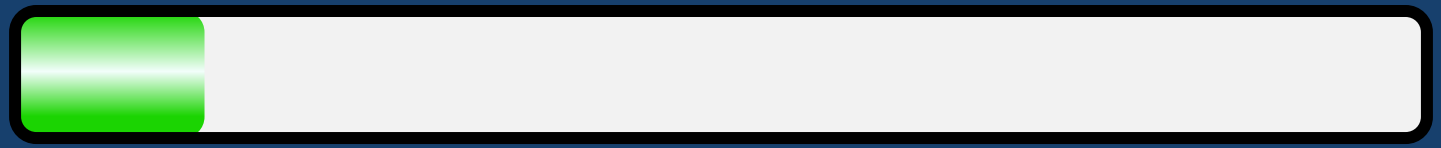
Web development with Python	Hours
Work skills development	50
Python Programming Introduction	150
Web Programming Introduction (html/css)	100
Databases Concepts and Structures	50
Web Servers Programming	150
Web services development	150
Total	650

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA

emprego digital

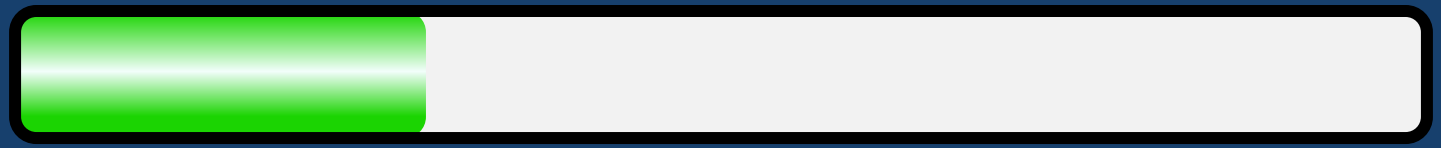
Python programming Introduction Content

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



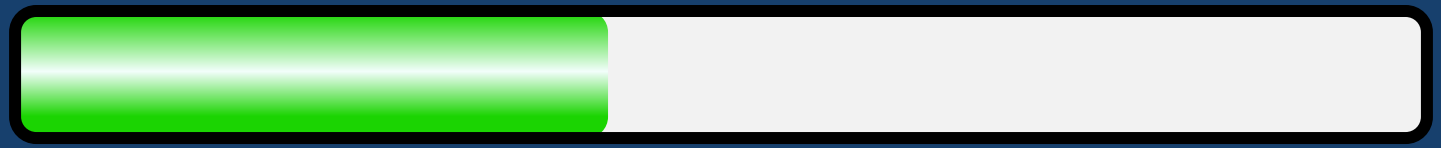
Python programming Introduction Content

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



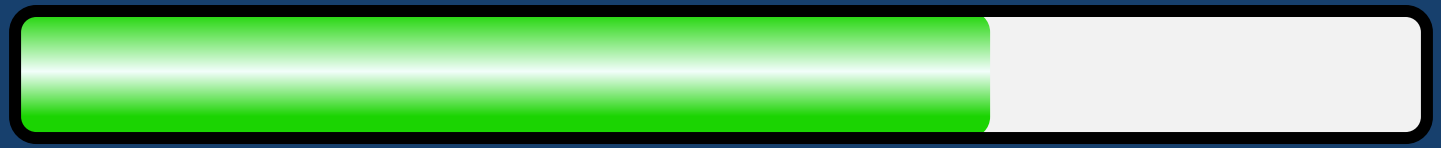
Python programming Introduction Content

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



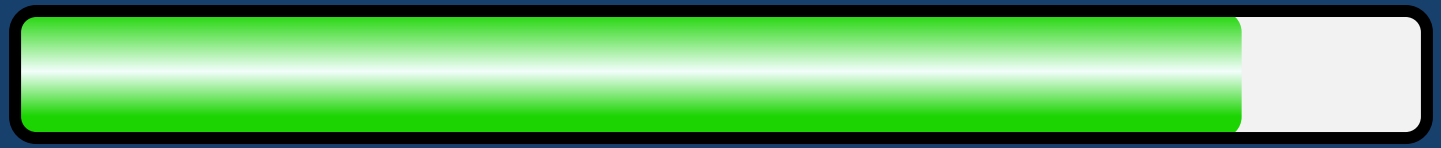
Python programming Introduction Content

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



Python programming Introduction Content

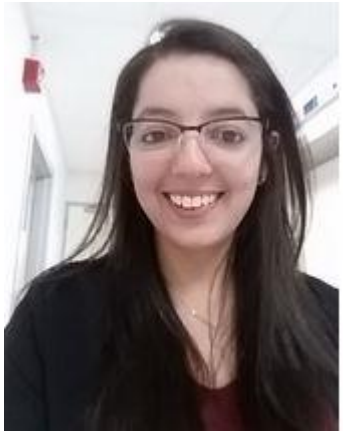
13. Files
14. Functions and Modules
15. Classes
16. Introduction to Numpy
17. Introduction to Pandas



Python programming Introduction Content

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

Our Teachers:



Joseanne Viana (Josi)

Email: jcova1@iscte-iul.pt

Stefan Postolache

Email:stefanpostolache@edu.ulisboa.pt

Hamed Farkhari

Email:Hamed_Farkhari@iscte-iul.pt

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

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Set

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Define Set

use [ ] to define a List
use (,) to define a Tuple
use { : } to define a Dictionary
use { , } to define a Set

```
f = {'apple', 'orange', 'banana'}

D = set()              # Empty set
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Example

```
f = {'apple', 'orange' , 'banana'}

# f[0]
# Error: 'set' object is not subscriptable

print(type(f))  # <class 'set'>

print(len(f))  # 3

print(f)       # {'orange', 'banana', 'apple'}

for i in f:
    print(i)

m = set(('orange' , 'banana' , 'apple'))

print(f == m)           # True

print('cherry' in f)    # False
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

add( )
update( )
remove( )

```
f = {'apple', 'orange' , 'banana'}


f.add('cherry')
print(f)
# {'orange', 'banana', 'cherry', 'apple'}

f.update(['mango' , 'grapes'])
print(f)
# {'cherry', 'orange', 'banana', 'apple', 'mango', 'grapes'}

f.remove('apple')
print(f)
# {'cherry', 'orange', 'banana', 'mango', 'grapes'}
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

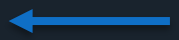
add( )
update( )

```
f = {'a', 'b', 'c'}
f.add('d')
# f.add('e', 'f')
f.add(('e2', 'f2'))  # {('e2', 'f2'), 'a', 'b', 'c', 'd'}
f.add(['e2', 'f2'])  # Error
# A = {'a', ['b', 'c']} # Error

f = {'a', 'b', 'c'}
f.update('g')  # {'a', 'b', 'c', 'g'}
f.update('h', 'i') # {'a', 'b', 'c', 'g', 'h', 'i'}

f = {'a', 'b', 'c'}
f.update(['h', 'i']) # {'a', 'b', 'c', 'h', 'i'}
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

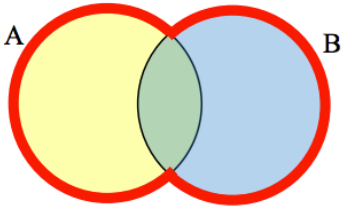
Remove( )
Discard( )
Copy( )
pop( )
Clear( )

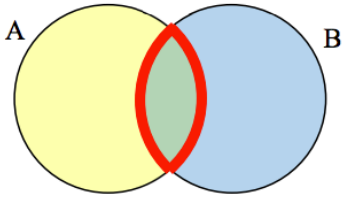
```
vowels = {'a','e','o','i','u'}


# 'k' is not in vowels
vowels.remove('k')  # Error: KeyError: 'k'

vowels.discard('k')
# if 'k' exist in vowels remove it, else No error

v2 = vowels      # V2 and vowels are dependent

c = vowels.copy()

print(vowels)  # {'a', 'u', 'o', 'i', 'e'}

x = vowels.pop() # randomly remove one the members in set

print(x)         # a
print(vowels)    # {'u', 'o', 'i', 'e'}
print(v2)        # {'u', 'o', 'i', 'e'}
print(c)         # {'u', 'o', 'i', 'e', 'a'}

vowels.clear()
print(vowels)   # set()
print(len(vowels))  # 0

del c
```

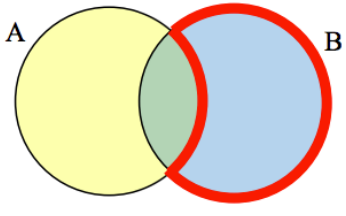


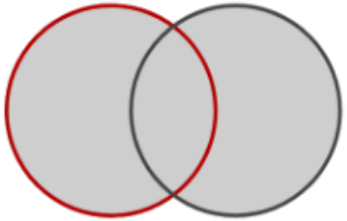
iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

review

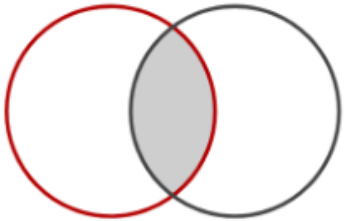




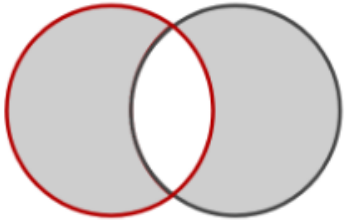




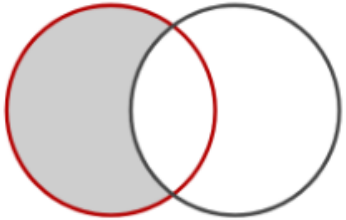
Union



Intersection



Symmetric Difference



Subtracting

http://www.cimt.org.uk/projects/mepres/book7/bk7i1/bk7_1i4.htm

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA

emprego digital

Union | Intersection & Update

```
X = {1, 2, 3}
Y = {2 ,3, 4}
print(X.union(Y))    # {1, 2, 3, 4}
print(X | Y)         # {1, 2, 3, 4}, | is OR
```

```
X = {1, 2, 3}
Y = {2 ,3, 4}
print(X.intersection(Y))     # {2, 3}
print(X & Y)                 # {2, 3}, & is and
```

```
X = {1, 2, 3}
Y = {2 ,3, 4}
X.update(Y)            # same as union
print(X)               # {1,2,3,4}
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Difference

Difference_update

Symmetric_difference

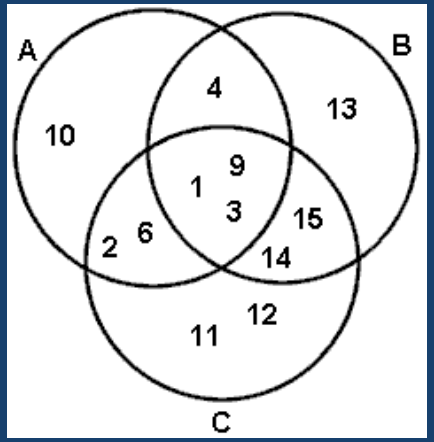
^

```
A = {1,2,3,4,5}
B = {2,4,7}

print(A-B)    # {1,3,5}
print(B-A)    # {7}

r = A.difference(B)
print(r)    # {1, 3, 5}
print(A)    # {1, 2, 3, 4, 5}
print(B)    # {2, 4, 7}


X = {1, 2, 3}
Y = {2 ,3, 4}
print(X.symmetric_difference(Y))        # {1, 4}
print(X ^ Y)                            # {1, 4}, ^ is XOR
print(X.union(Y) - X.intersection(Y))   # {1, 4}
print(X.union(Y) - Y.intersection(X))   # {1, 4}


r = A.difference_update(B)  # nothing return in output
print(r)    # None
print(A)    # {1, 3, 5}
print(B)    # {2, 4, 7}
```

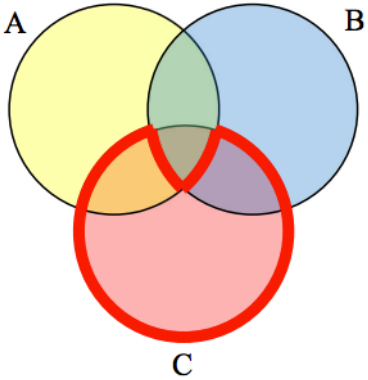
iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

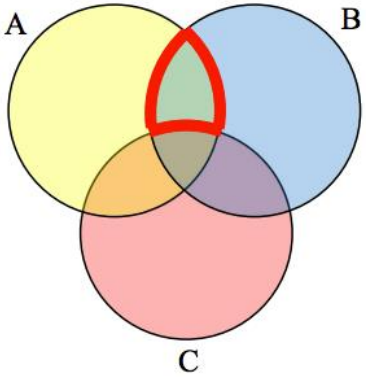

<Exercise 1>

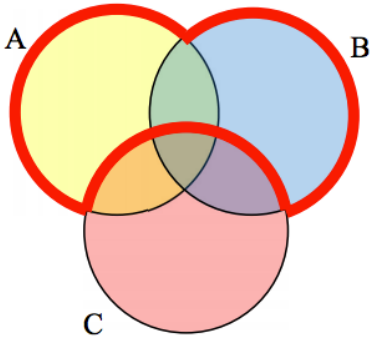
Exercise



Could you answer?

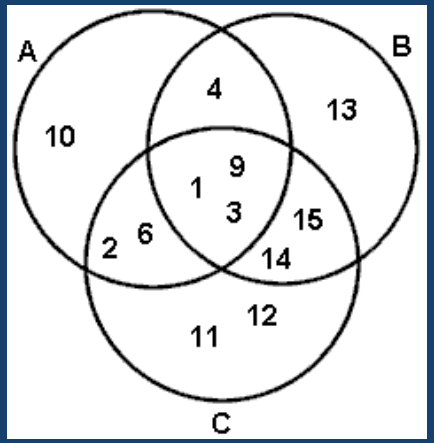






iscte INSTITUTO UNIVERSITÁRIO DE LISBOA emprego digital

Exercise Answer




```
A = {1, 2, 3, 4, 6, 9, 10,}
B = {1, 3, 4, 9, 13, 14, 15}
C = {1, 2, 3, 6, 9, 11, 12, 14, 15}

# part 1 is {2, 6, 11, 12, 14, 15}
answer1_1 = C - A.intersection(B).intersection(C)
answer1_2 = C - A.intersection(B , C)
answer1_3 = C.difference(A & B & C)


#  Part 2 is {4}
answer2_1 = (A & B) - C
answer2_2 = (A.intersection(B)) - C

# Part 3 is {4, 10, 13}
answer3_1 = A.union(B) - C
answer3_2 = (A | B) - C
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

update

```
s = 'Hamed'                 # string

a = [13,25]                 # list

t = (7 , 8 )                # tuple

d = {'one':1 , 'two':2}     # dictionary

X = {56 , 98}               # set

X.update(s,a,t,d)


print(X)    # {'one', 98, 'two', 7, 8, 13, 'a', 'H', 56, 25, 'd', 'm', 'e' }
```

split string to characters

only keys of dict is considered

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

isdisjoint

X and Y have intersection or Not?

```
X = {1, 2}
Y = {1, 2, 3}
print(X.isdisjoint(Y))    # False

X = {1, 2}
Y = {3, 7, 8}
print(X.isdisjoint(Y))    # True
```

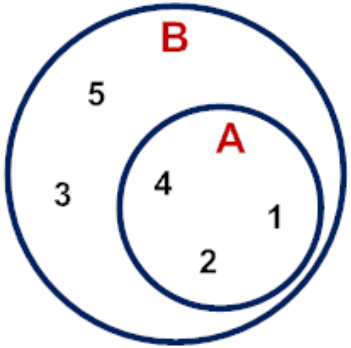
X and Y have no intersection

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

issubset

Subset

We say that A is a subset of B since every element of A is also in B.



$A \subset B$

```
A = {1, 2, 4}

B = {1, 2 , 3, 4, 5}

print(A.issubset(B))   # True

print(B.issubset(A))   # False


C = set()                    # C is an Empty set

print(C.issubset(A))   # True

print(A.issubset(C))   # False
```

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA

emprego digital


<Exercise 2>

Exercise

Which characters of

'a' , 'y' , 'c' , 'o' , 'z' are in

'Python Course' ?

Output: 'o' , 'y'

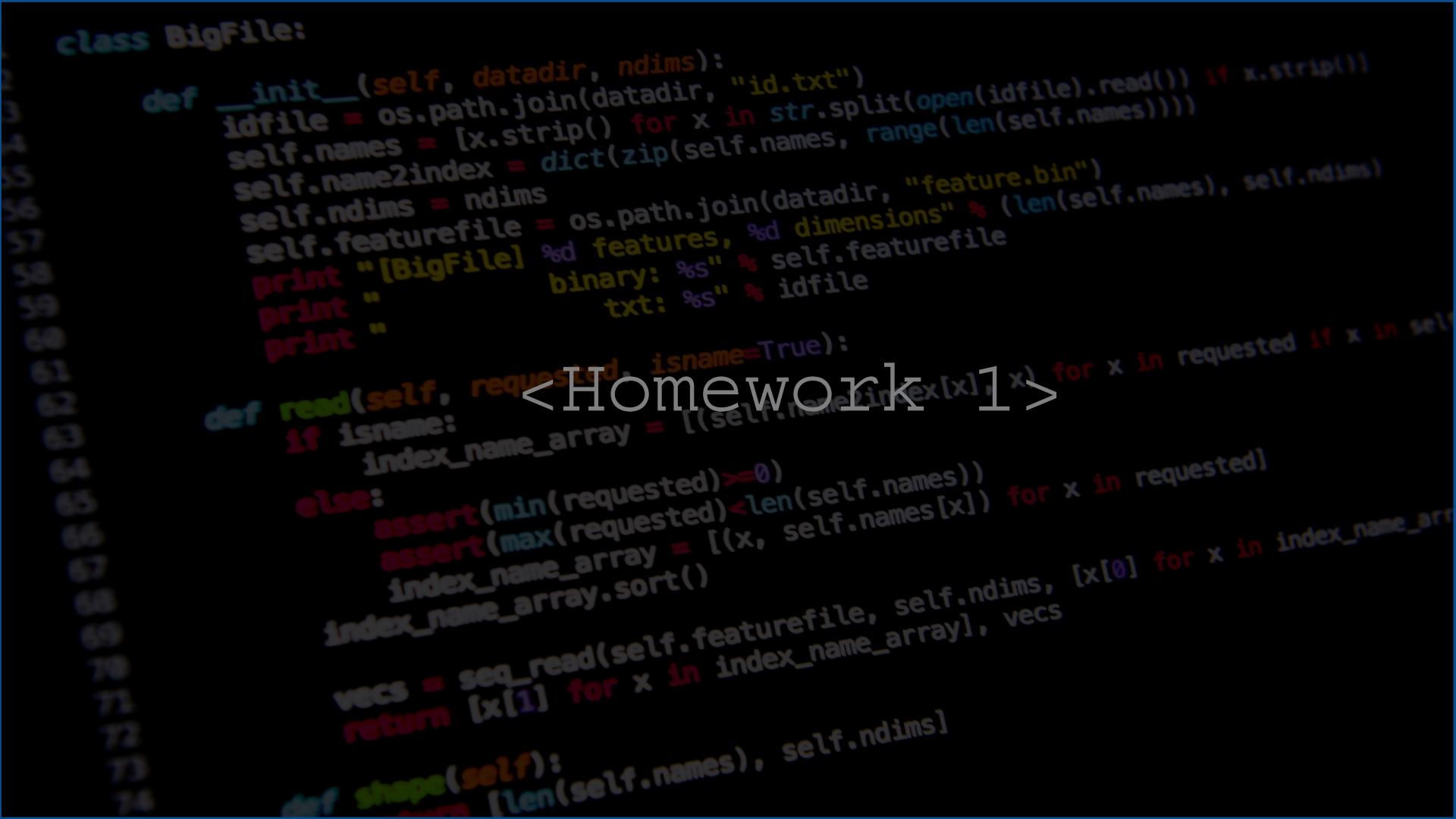
iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Solution

```
w = 'Python Course'

char = {'a' , 'y', 'c', 'o', 'z'}


w_set = set(w)
print(char.intersection(w_set))   # {'o', 'y'}

print(w_set.intersection(char))   # {'o', 'y'}
```

Convert string to set

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital


<Homework 1>

Homework

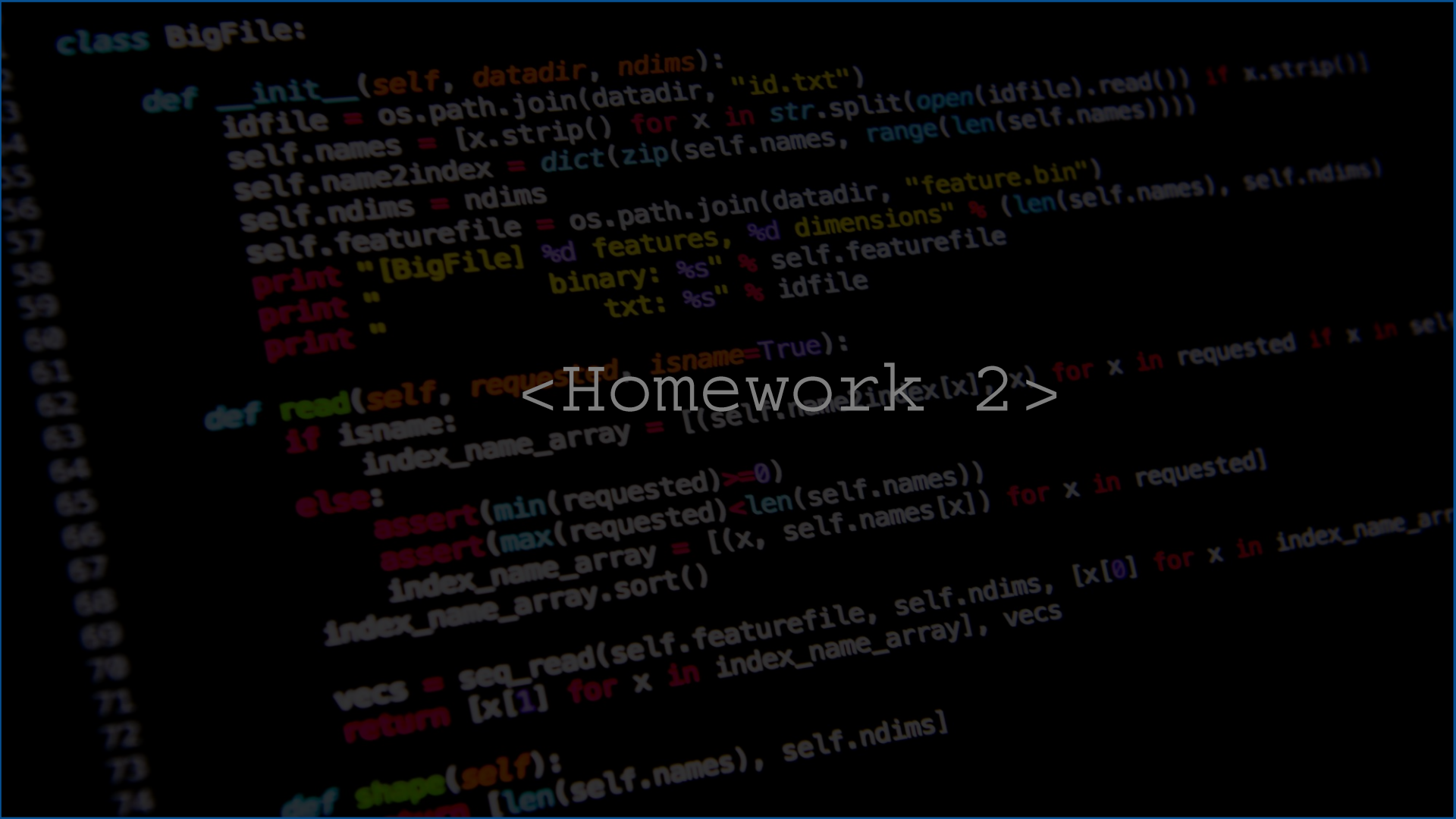
Find match key:value in 2 dictionaries

```
d1 = {'a':1 , 'b':3 , 'c':2}

d2 = {'a':2 , 'b':3 , 'c':1}
```

Try to use set!

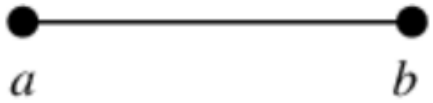
Output: {'b':3}

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital


<Homework 2>

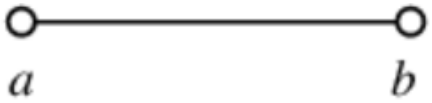
Interval, mathematics

a <= X <= b



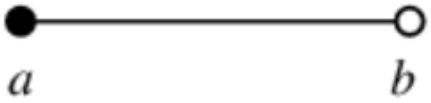
closed interval [a, b]

a < X < b



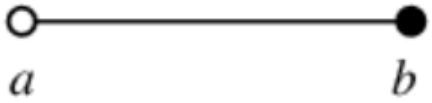
open interval (a, b)

a <= X < b



half-closed interval [a, b)

a < X <= b

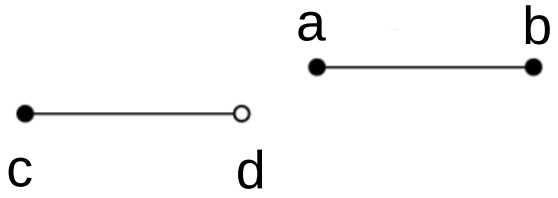


half-closed interval (a, b]

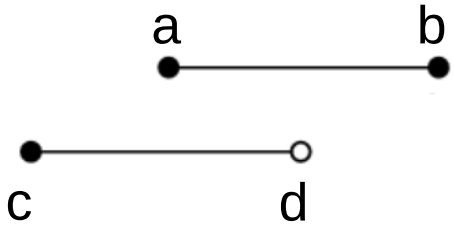
iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Homework

Find the intersection of 2 intervals

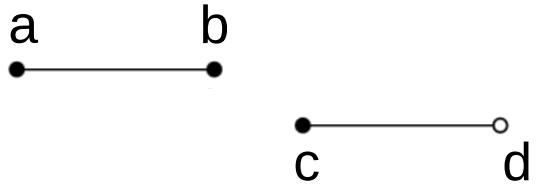


No Intersection

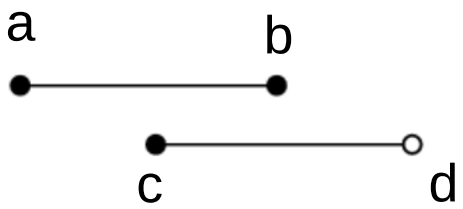


a <= X < d

[a , d)



No Intersection



c <= X <= b

[c , b]

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Summary

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

List

define a list with [ ] list()

ordered

mutable , changeable

length of list can be changed

can be contain of different obj types

indexed, index start from Zero

methods in List:

'append', 'clear', 'copy', 'count',
'extend', 'index', 'insert', 'pop',
'remove', 'reverse', 'sort'

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Tuple

define a tuple with ( ) tuple()

ordered

immutable , unchangeable

length of tuple can Not be changed

can be contain of different obj types

indexed, index start from Zero

methods in tuple:

'count', 'index'

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Dictionary

define a dictionary with { : }

dict([('a', 1), ('b', 2)])

dict(a = 1, b = 2, c = 3)

mutable , changeable

not ordered until python version 3.7+

can be contain of different obj types

methods in dict:
'clear' , 'copy' , 'fromkeys' ,
'get' , 'items' , 'keys' , 'pop' ,
'popitem', 'setdefault' ,
'update' , 'values'

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

Set

define a set with { }

set( )

no duplicates ==> good for remove duplicates

not ordered ==> 'set' object is not subscriptable

mutable , changeable

methods in set:
'add', 'clear', 'copy', 'difference', 'difference_update',
'discard', 'intersection', 'intersection_update',
'isdisjoint', 'issubset', 'issuperset', 'pop',
'remove', 'symmetric_difference',
'symmetric_difference_update',
'union', 'update'

iscte INSTITUTO UNIVERSITÁRIO DE LISBOA
emprego digital

“

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


O futuro profissional
começa aqui
iscte
INSTITUTO
UNIVERSITÁRIO
DE LISBOA
emprego
digital
UPskill