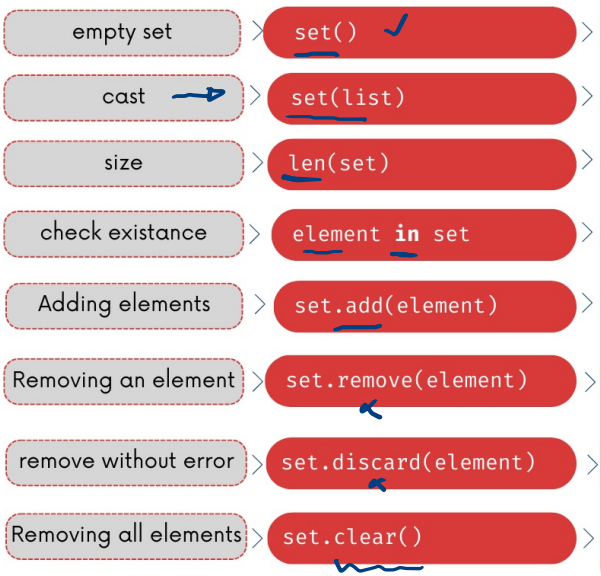
python / session 2

Set

- A Python set is an unordered list of immutable elements. It means:
  - Elements in a set are unordered.
  - Elements in a set are unique. A set doesn't allow duplicate elements.
  - Elements in a set cannot be changed. For example, they can be numbers, strings, and tuples, but cannot be lists or dictionaries.

```
{'r', 'l', 't', 'e'}  #curly brace {}
```

Set Manipulation




```
letters = set(['P','C'])
print(letters)
#out: {'P', 'C'}

ratings = {1, 2, 3, 4, 5}
size = len(ratings)
print(size)
#out: 5

ratings = {1, 2, 3, 4, 5}
rating = 1
if rating in ratings:
   print('there is')
#out: there is

s = {'P', 'S', 'P'}
s.remove('S')
```

String → Iterable

Strings & Loops

- these two code snippets do the same thing

```
>>> s = "abcdefgh"

>>> for index in range(len(s)):
>>>     if s[index] == 'i' or s[index] == 'u':
>>>         print("There is an i or u")



>>> for char in s:
>>>     if char == 'i' or char == 'u':
>>>         print("There is an i or u")
```

The f-strings provide a way to embed variables and expressions inside a string literal using a clearer syntax than the format() method.

F-strings

- F'text {first_variable} text {second_variable}' --> F or f

```
s = F'Hello, {first_name} {last_name}!'
```

- Multiline F-String

```
message = ( f'Hello {name}. '
f"You're learning Python at {website}.")

message = f'Hello {name}. ' \
f"You're learning Python at {website}."

message = f"""Hello {name}. You're
learning Python at {website}."""
```

F-strings

- Format numbers using f-strings

```
number = 200
 s = f'{number: 06}'
print(s)
#space06
# 00200, pad zeros
# at the beginning of the number
```

```
number = 9.98567
 s = f'{number: .2f}'
print(s) # 9.99
```

```
number = 400000000000
 s = f'{number: ,}'
 # also can use _
print(s) # 400,000,000,000
```

```
number = 0.1259
s = f'{number: .2%}'
print(s)
# 12.59%
s = f'{number: .1%}'
print(s) # 12.5%
```

Raw strings

In Python, when you prefix a string with the letter r or R such as r'...' and R'...', that string becomes a raw string.

```
s ='lang\tver\nPython\t3'
print(s)

lang ver
Python 3
```

```
s = r'lang\tver\nPython\t3'
print(s)

#out: lang\tver\nPython\t3
```

Backslash

- #backslash (\) escape other special characters
- \n: new line
- \t: Tab means(8 spaces)
- \\: Back slash
- \': Single quote (')
- \": Double quote (")

```
print('I suppose you are student.\nAre you ?')

#I suppose you are student.
#Are you ?
```

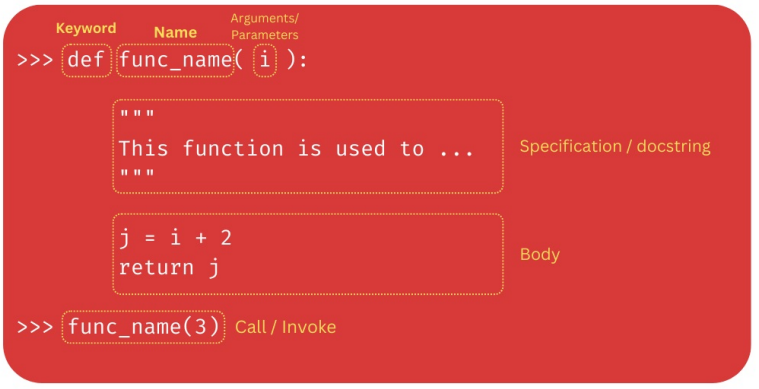
```
print('I suppose you are student.\\nAre you ?')

#I suppose you are student.\nAre you ?
```

```
print('Days\tTopics\tExercises')

#Days Topics Exercises
```

```
print('Days\\tTopics\\tExercises')

#Days\tTopics\tExercises
```

Python Function

A function is a named code block that performs a job or returns a value.

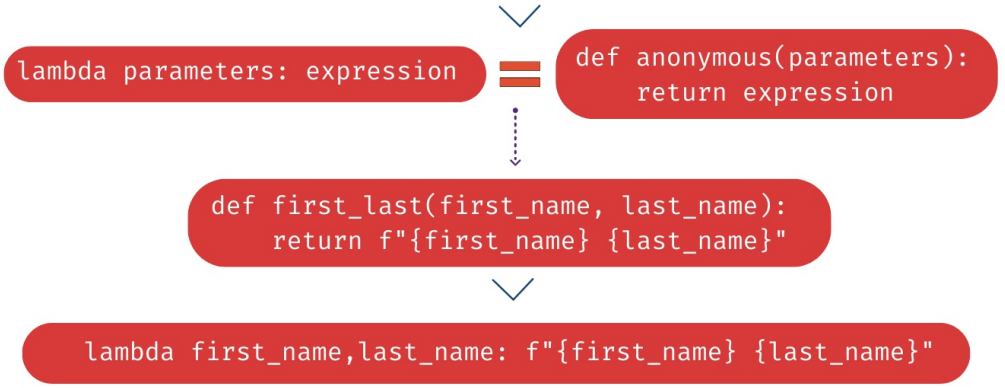


Lambda Expressions

Python lambda expressions allow you to define anonymous functions.

Anonymous functions are functions without names. The anonymous functions are useful when you need to use them once.

A lambda expression typically contains one or more arguments, but it can have only one expression.



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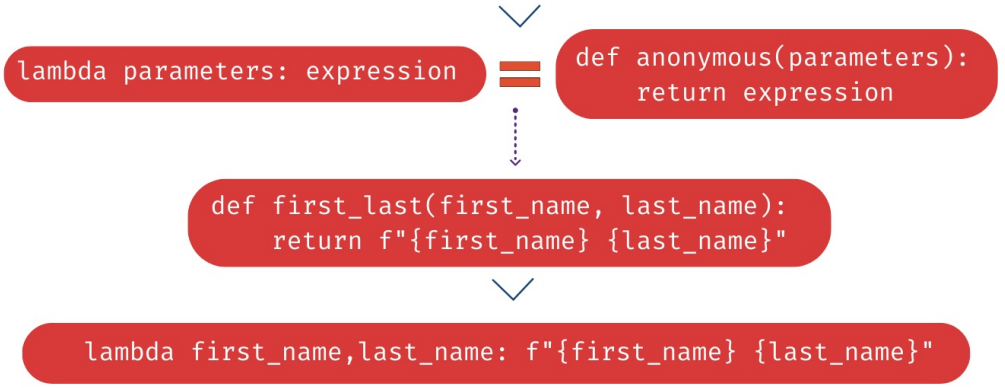


Lambda Examples

```
x = lambda a : a + 10
print(x(5))
```

```
x = lambda a, b : a * b
print(x(5, 6))
```

```
x = lambda a, b, c : a + b + c
print(x(5, 6, 2))
```

```
def myfunc(n):
  return lambda a : a * n

mydoubler = myfunc(2)
print(mydoubler(11))
```

src: w3schools.com

ITERATION vs RECURSION

ITERATION

```
# factorial iteration solution
>>> def fact_iter(n):
        prod = 1
        for i in range(1, n+1):
            prod *= i
        return prod

>>> fact_iter(5)
```

RECURSION

```
# factorial recursive solution
>>> def fact_recur(n):
        if n == 1:
            return 1
        else:
            return n * fact_recur(n-1)

>>> fact_recur(n)
```

- recursion may be simpler, more intuitive
- recursion may be efficient from programmer POV
- recursion may not be efficient from computer POV

for element in list:

while, wile

type of errors

- **Syntax Error** > When you write an invalid Python code, you'll get a syntax error.
- **Exceptions** > In Python, errors that occur during the execution are called exceptions.

```
current = 1
if current < 10
current += 1
```

Syntax Error

```
print(0/0)
```

Exception Error

string

func (a, b)

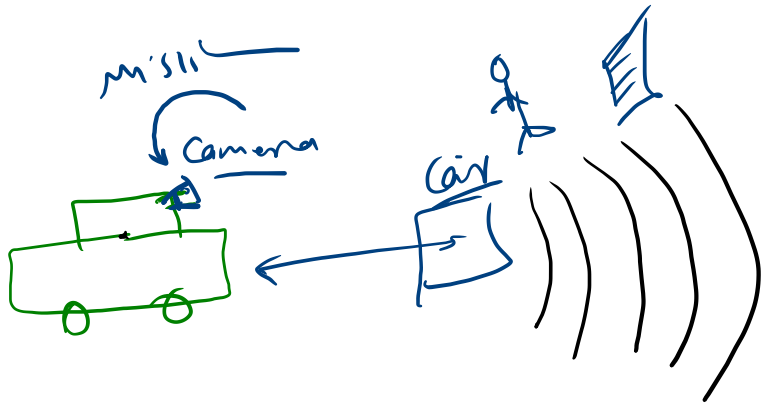
print (a + b) → 5

Exception

Few : Forward Collision Warning!

Monocular

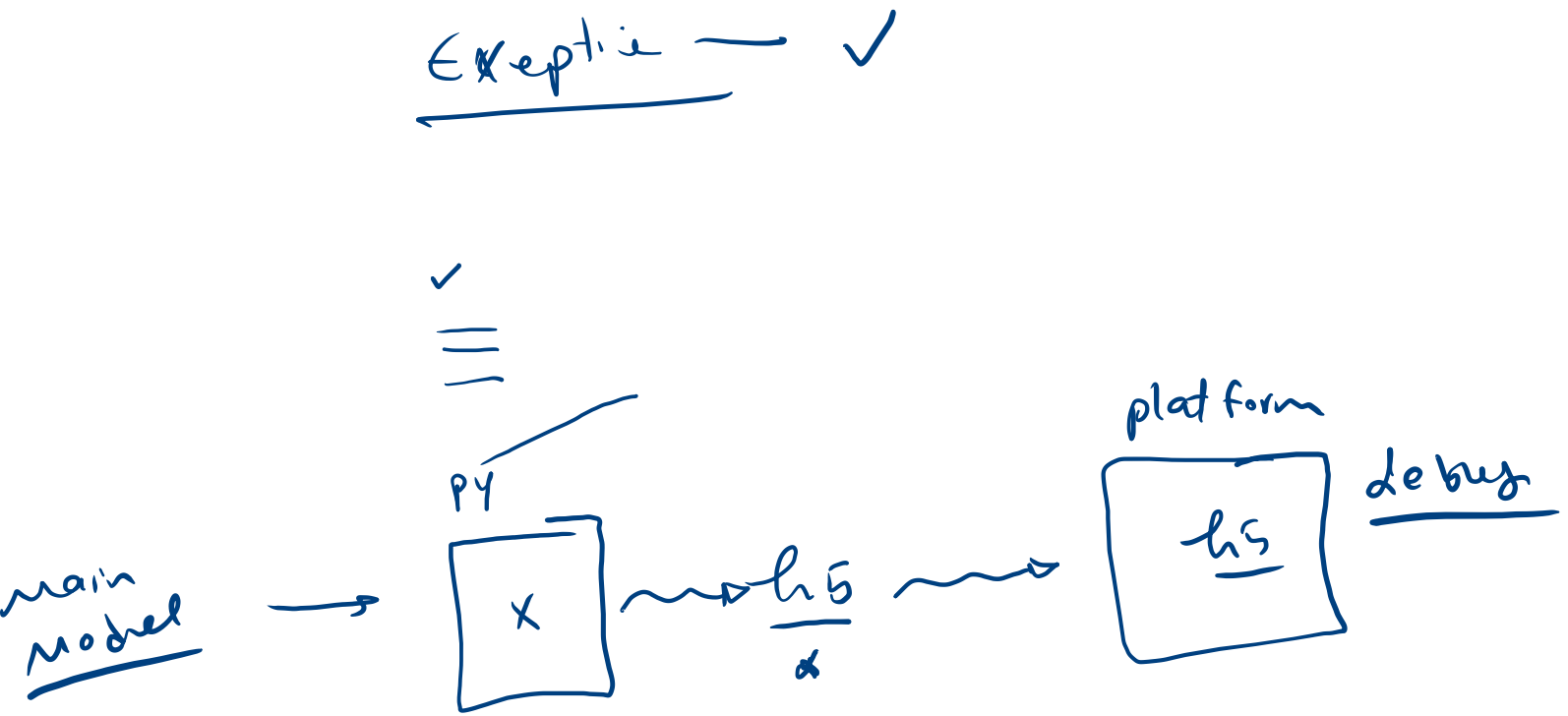
Azil



model → model

empty frames

Ex —


Exeptio
plat form
debug
py
main
model
x
h5
h5

try...except

The try block lets you test a block of code for errors.

The except block lets you handle the error.

```
try:
# code that may cause error

except:
# handle errors
```

```
def division(a, b)
    try:
       print(a/b)

    except:
       print("An exception occurred")
```

src: w3schools.com

→ $a \times b$

→ $\underbrace{a + a + a + a \cdots + a}_{b}$