




Lets learn Python

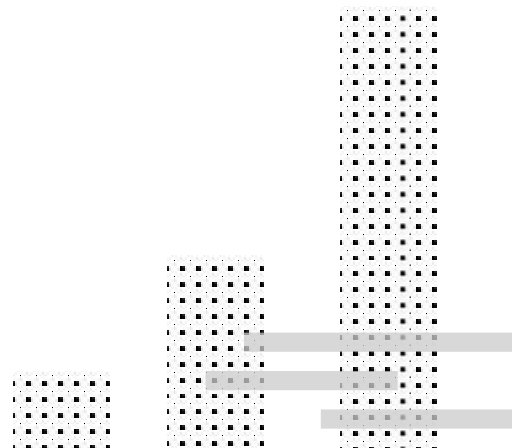
ekakshya.com
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Lesson 3



- Dictionaries
- Sets
- Exceptions
- Functions
- Scope



Dictionary

- Dictionary is an unordered key-value storage structure. Also, a member of data type collection.
- Values can be retrieved through keys only
- Generally, used for calculating frequency of some characters in a given term. For example: Apple { "A": 1, "p": 2, "l": 1, "e": 1 }
- Faster key search and retrieval times when compared to list
- Dictionaries can be used to keep track of how many times a key occurs in the given string, list or tuple

Dictionary

```
a_dict = { "A": 1, "p": 2, "l": 1, "e": 1} # cannot have dictionary for a key
print(len(a_dict))
a_dict['e'] += 1
a_dict['g'] = a_dict.get("g", 0) + 1
print(a_dict["A"])
del a_dict['e']
print(a_dict)
print('e' in a_dict) #false
```

```
another_dict = dict() #another_dict = {}
```

```
for key in a_dict.keys():
    print(key)
for value in a_dict.values():
    print(value)
for key,value in a_dict.items():
    print(key,value)
```

Sets

- An unordered unique collection of elements
- It can contain only immutable data types like tuples. As such lists, set and dictionary cannot be added to a set
- Sets can be used to check if an element is present or not inside it

Sets

```
a_set = {3,4,5,5,4,3,"Hi", False,(3,8)}  
another_set = set() #initializing another_set  
print(a_set)
```

```
a_set.add(7)  
a_set.add(7)
```

```
print(a_set)
```

```
a_set.remove(7)  
print(a_set)  
print(len(a_set))  
print(4 in a_set)
```

Sets

```
a_set = {3,4,5,5,4,3,"Hi", False,(3,8)}
```

```
another_set = {3,4,5,7,8,9}
```

```
#does not modify original set
```

```
union_set = a_set.union(another_set) #a_set | another_set
```

```
intersection_set = a_set.intersection(another_set) #a_set & another_set
```

```
difference_a_set = a_set.difference(another_set) #a_set - another_set
```

```
difference_another_set = another_set.difference(a_set) #another_set - a_set
```

```
symmetric_difference_a_set = a_set.symmetric_difference(another_set) #a_set ^ another_set
```

```
print(union_set)
```

```
print(intersection_set)
```

```
print(difference_a_set)
```

```
print(difference_another_set)
```

```
print(symmetric_difference_a_set)
```

```
print(a_set)
```

```
#modifies original set
```

```
a_set.update(another_set)
```

```
a_set.difference_update(another_set)
```

```
another_set.symmetric_difference_update(a_set)
```

```
print(a_set)
```

```
print(another_set)
```

Sets

```
a_set = {3,4,5,5,4,3,"Hi", False,(3,8)}
```

```
another_set = {3,4,5}
```

```
print(another_set.issubset(a_set)) # another_set <= a_set
```

```
print(a_set.issuperset(another_set)) # a_set >= another_set
```

```
#proper superset and subset
```

```
print(another_set < a_set) #proper subset
```

```
print(a_set > another_set) #proper superset
```


Exceptions

- Exceptions are used to handle errors
- It is a form of defensive programming so that the errors doesn't crash our program
- We can handle all exceptions through generic exception or specific exceptions depending on our use case
- Errors occur sequentially so their specific exception handling block is called when we have multiple exceptions in a program
- Not a good practice to have generic exception handler in python
- Use exception handler only when there is a possibility of error
- Runtime exception occurs when program is being executed
- Compile time exception occurs when program is converted to low level code and before the program gets executed

Exceptions

```
try:
    2/0
    a_list[1] += 1
except Exception as e:
    print("Generic exception handler called")
except ZeroDivisionError as e:
    print("Exception occurred", e)
finally:
    print("Done")
```

```
#prevent program from running
raise Exception("An error occurred")
```

Functions

- Function is a reusable piece or block of code
- Some functions we have used so far: input(), print(), len()

```
def another_function():  
    print("Hello World")
```

```
def a_function(a_string="Hello"):  
    print(a_string)
```

```
def add_10(num=7):  
    return num + 10
```

```
def is_number_value(value= 0, num=5): #(value=0 , num) wont work | (value, num=5) will work  
    if num == value:  
        return 1  
    return -1
```

```
another_function()  
a_function()  
add_10(15)  
is_number_value(num=-7)  
is_number_value(num=-7, value=-7)
```

Functions

```
def a_function(a_num,another_num):  
    return a_num + 1, another_num +1
```

```
first_num, second_num = a_function(3,1)  
result = a_function(7,2)  
print(first_num, second_num)  
print(result)
```

PS: Functions can be defined within a function as such they are not available outside the function

Scope

```
num = 0 #global scope
def a_function():
    num = 10 #function scope
print(num)
```

PS: Variable defined inside a functions are limited to scope of function it is defined. Hence, they are not accessible outside the function

The End

Thank You

