Python – Dictionary and its Operations

Dictionary

- A dictionary is a collection which is changeable and indexed.
- In Python dictionaries are written with curly brackets, and they have keys and values.
- Each key is separated from its value by a colon (:)
  - the items are separated by commas, and
  - the whole thing is enclosed in curly braces.
- An empty dictionary without any items is written with just two curly braces, like this: {}. (Eg: sample_dict= {})
- Dictionary values have no restrictions i.e. the values of a dictionary can be of any type.
- They can be any arbitrary Python object, either standard objects or user-defined objects.
- However, same is not true for the keys
  - The keys must be of data type such as strings, numbers, or tuples.
  - Keys are unique within a dictionary while values may not be.
  - When duplicate keys encountered during assignment, the last assignment wins

Create and print a dictionary:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}
print(student_dict)
```

```
{'Name': 'Ravi', 'Science': 100, 'History': 95, 'Maths': 100, 'Result': 'PASS'}
```

Accessing Items

You can access the items of a dictionary by referring to its key name, inside square brackets:

Example

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

x=student_dict["Name"]
print(x)
```

There is also a method called get() that will give you the same result:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

x = student_dict.get("Name")
m1= student_dict.get("Science")
m2= student_dict.get("History")
m3= student_dict.get("Maths")
y = student_dict.get("Result")

print(x)
print(m1)
print(m2)
print(m3)
print(y)
```

```
Ravi
100
95
100
PASS
```

Change Values

You can change the value of a specific item by referring to its key name:

Example

```
student_dict["Maths"]=20                //Changing the value
student_dict["Result"]="Fail"           //Changing the value
```

```
Ravi
100
95
20
Fail
```

Loop Through a Dictionary

You can loop through a dictionary by using a for loop.

Way to print all key names in the dictionary, one by one:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}
for x in student_dict:
  print(x)
```

```
Name
Science
History
Maths
Result
```

Print all *values* in the dictionary, one by one:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}
for x in student_dict:
  print(student_dict[x])
```

```
Ravi
100
95
20
Fail
```

You can also use the values() method to return values of a dictionary:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

for x in student_dict.values():
  print(x)
```

```
Ravi
100
95
20
Fail
```

Loop through both *keys* and *values*, by using the items() method:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

for x, y in student_dict.items():
  print(x, y)
```

```
Name Ravi
Science 100
History 95
Maths 20
Result Fail
```

Check if Key Exists

To determine whether a specified key is present in a dictionary or not, we can use the in keyword:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

if "Result" in student_dict:
  print("Yes. The key 'Result' is one of the keys in the student dictionary")

else:
  print("No. The key 'Result' is not in the student dictionary")

if "Total" in student_dict:
  print("Yes, The key 'Total' is one of the keys in the student dictionary")
else:
  print("No. The key 'Total' is not in the student dictionary")
```

```
Yes. The key 'Result' is one of the keys in the student dictionary
No. The key 'Total' is not in the student dictionary
```

Dictionary Length

To determine how many items (key-value pairs) a dictionary has, use the len() function.

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

length= len(student_dict)
```

```
Length of the student dictionary is:  5
```

Adding Items

Adding an item to the dictionary is done by using a new index key and assigning a value to it:

```
student_dict = {
  "Name": "Ravi",
  "Science": 100,
  "History": 95,
  "Maths": 100,
  "Result":"PASS"
}

print("Initial Dictionary")
print(student_dict)
student_dict["Total"] = 295  # New key-value pair is added
print("\n")
print("Dictionary after adding new key-value pair")
print(student_dict)
```

```
Initial Dictionary
{'Name': 'Ravi', 'Science': 100, 'History': 95, 'Maths': 100, 'Result': 'PASS'}


Dictionary after adding new key-value pair
{'Name': 'Ravi', 'Science': 100, 'History': 95, 'Maths': 100, 'Result': 'PASS', 'Total': 295}
```