Built-in String Methods

Python includes the following built-in methods to manipulate strings:

Sr. No.	Methods with Description
1	capitalize() Capitalizes first letter of string.
2	center(width, fillchar) Returns a space-padded string with the original string centered to a total of width columns.
3	count(str, beg= 0,end=len(string)) Counts how many times str occurs in string or in a substring of string if starting index beg and ending index end are given.
4	decode(encoding='UTF-8',errors='strict') Decodes the string using the codec registered for encoding. encoding defaults to the default string encoding.
5	encode(encoding='UTF-8',errors='strict') Returns encoded string version of string; on error, default is to raise a ValueError unless errors is given with 'ignore' or 'replace'.
6	endswith(suffix, beg=0, end=len(string)) Determines if string or a substring of string (if starting index beg and ending index end are given) ends with suffix; returns true if so and false otherwise.
7	expandtabs(tabsize=8) Expands tabs in string to multiple spaces; defaults to 8 spaces per tab if tabsize not provided.
8	find(str, beg=0 end=len(string)) Determine if str occurs in string or in a substring of string if starting index beg and ending index end are given returns index if found and -1 otherwise.
9	index(str, beg=0, end=len(string)) Same as find(), but raises an exception if str not found.

10	isalnum() Returns true if string has at least 1 character and all characters are alphanumeric and false otherwise.
11	isalpha() Returns true if string has at least 1 character and all characters are alphabetic and false otherwise.
12	isdigit() Returns true if string contains only digits and false otherwise.
13	islower() Returns true if string has at least 1 cased character and all cased characters are in lowercase and false otherwise.
14	isnumeric() Returns true if a unicode string contains only numeric characters and false otherwise.
15	isspace() Returns true if string contains only whitespace characters and false otherwise.
16	istitle() Returns true if string is properly "titlecased" and false otherwise.
17	isupper() Returns true if string has at least one cased character and all cased characters are in uppercase and false otherwise.
18	join(seq) Merges (concatenates) the string representations of elements in sequence seq into a string, with separator string.
19	len(string) Returns the length of the string.
20	ljust(width[, fillchar]) Returns a space-padded string with the original string left-justified to a total of width columns.

21	lower() Converts all uppercase letters in string to lowercase.
22	lstrip() Removes all leading whitespace in string.
23	maketrans() Returns a translation table to be used in translate function.
24	max(str) Returns the max alphabetical character from the string str.
25	min(str) Returns the min alphabetical character from the string str.
26	replace(old, new [, max]) Replaces all occurrences of old in string with new or at most max occurrences if max given.
27	rfind(str, beg=0,end=len(string)) Same as find(), but search backwards in string.
28	rindex(str, beg=0, end=len(string)) Same as index(), but search backwards in string.
29	rjust(width,[, fillchar]) Returns a space-padded string with the original string right-justified to a total of width columns.
30	rstrip() Removes all trailing whitespace of string.
31	split(str="", num=string.count(str)) Splits string according to delimiter str (space if not provided) and returns list of substrings; split into at most num substrings if given.
32	splitlines(num=string.count('\n')) Splits string at all (or num) NEWLINEs and returns a list of each line with NEWLINEs removed.

33	startswith(str, beg=0,end=len(string)) Determines if string or a substring of string (if starting index beg and ending index end are given) starts with substring str; returns true if so and false otherwise.
34	strip([chars]) Performs both lstrip() and rstrip() on string.
35	swapcase() Inverts case for all letters in string.
36	title() Returns "titlecased" version of string, that is, all words begin with uppercase and the rest are lowercase.
37	translate(table, deletechars="") Translates string according to translation table str(256 chars), removing those in the del string.
38	upper() Converts lowercase letters in string to uppercase.
39	zfill (width) Returns original string leftpadded with zeros to a total of width characters; intended for numbers, zfill() retains any sign given (less one zero).
40	isdecimal() Returns true if a unicode string contains only decimal characters and false otherwise.

Let us study them in detail:

1. capitalize() Method

It returns a copy of the string with only its first character capitalized.

Syntax

```
str.capitalize()
```

Parameters

NA

['Hi!'] * 4	['Hi!', 'Hi!', 'Hi!', 'Hi!']	Repetition
3 in [1, 2, 3]	True	Membership
for x in [1, 2, 3]: print x,	1 2 3	Iteration

Indexing, Slicing, and Matrixes

Because lists are sequences, indexing and slicing work the same way for lists as they do for strings.

Assume the following input:

```
L = ['spam', 'Spam', 'SPAM!']
```

Python Expression	Results	Description
L[2]	'SPAM!'	Offsets start at zero
L[-2]	'Spam'	Negative: count from the right
L[1:]	['Spam', 'SPAM!']	Slicing fetches sections

Built-in List Functions and Methods

Python includes the following list functions:

Sr. No.	Function with Description
1	cmp(list1, list2) Compares elements of both lists.
2	len(list) Gives the total length of the list.
3	max(list) Returns item from the list with max value.

4	min(list) Returns item from the list with min value.
5	list(seq) Converts a tuple into list.

Let us go through the functions in detail:

Cmp(list1, list2)

Description

The method **cmp()** compares elements of two lists.

Syntax

Following is the syntax for **cmp()** method:

```
cmp(list1, list2)
```

Parameters

- **list1** -- This is the first list to be compared.
- **list2** -- This is the second list to be compared.

Return Value

If elements are of the same type, perform the compare and return the result. If elements are different types, check to see if they are numbers.

- If numbers, perform numeric coercion if necessary and compare.
- If either element is a number, then the other element is "larger" (numbers are "smallest").
- Otherwise, types are sorted alphabetically by name.

If we reached the end of one of the lists, the longer list is "larger." If we exhaust both lists and share the same data, the result is a tie, meaning that 0 is returned.

Example

The following example shows the usage of cmp() method.

```
#!/usr/bin/python
```

Sr. No.	Methods with Description
1	list.append(obj) Appends object obj to list
2	list.count(obj) Returns count of how many times obj occurs in list
3	list.extend(seq) Appends the contents of seq to list
4	list.index(obj) Returns the lowest index in list that obj appears
5	list.insert(index, obj) Inserts object obj into list at offset index
6	list.pop(obj=list[-1]) Removes and returns last object or obj from list
7	list.remove(obj) Removes object obj from list
8	list.reverse() Reverses objects of list in place
9	list.sort([func]) Sorts objects of list, use compare func if given

Let us go through the methods in detail:

List.append(obj)

Description

The method **append()** appends a passed *obj* into the existing list.

Syntax

Following is the syntax for **append()** method:

```
#!/usr/bin/python


tup = ('physics', 'chemistry', 1997, 2000);


print tup;

del tup;

print "After deleting tup : "

print tup;
```

This produces the following result. Note an exception raised, this is because after **del tup,** tuple does not exist anymore:

```
('physics', 'chemistry', 1997, 2000)

After deleting tup :

Traceback (most recent call last):

  File "test.py", line 9, in <module>

    print tup;

NameError: name 'tup' is not defined
```

Basic Tuples Operations

Tuples respond to the + and * operators much like strings; they mean concatenation and repetition here too, except that the result is a new tuple, not a string.

In fact, tuples respond to all of the general sequence operations we used on strings in the prior chapter:

Python Expression	Results	Description
len((1, 2, 3))	3	Length
(1, 2, 3) + (4, 5, 6)	(1, 2, 3, 4, 5, 6)	Concatenation

('Hi!',) * 4	('Hi!', 'Hi!', 'Hi!', 'Hi!')	Repetition
3 in (1, 2, 3)	True	Membership
for x in (1, 2, 3): print x,	1 2 3	Iteration

Indexing, Slicing, and Matrixes

Because tuples are sequences, indexing and slicing work the same way for tuples as they do for strings. Assuming following input:

```
L = ('spam', 'Spam', 'SPAM!')
```

Python Expression	**Results**	**Description**
L[2]	'SPAM!'	Offsets start at zero
L[-2]	'Spam'	Negative: count from the right
L[1:]	['Spam', 'SPAM!']	Slicing fetches sections

No Enclosing Delimiters:

Any set of multiple objects, comma-separated, written without identifying symbols, i.e., brackets for lists, parentheses for tuples, etc., default to tuples, as indicated in these short examples:

```
#!/usr/bin/python



print 'abc', -4.24e93, 18+6.6j, 'xyz';

x, y = 1, 2;

print "Value of x , y : ", x,y;
```

When the above code is executed, it produces the following result:

```
abc -4.24e+93 (18+6.6j) xyz
```

```
Value of x , y : 1 2
```

Built-in Tuple Functions

Python includes the following tuple functions:

Sr. No.	Function with Description
1	cmp(tuple1, tuple2) Compares elements of both tuples.
2	len(tuple) Gives the total length of the tuple.
3	max(tuple) Returns item from the tuple with max value.
4	min(tuple) Returns item from the tuple with min value.
5	tuple(seq) Converts a list into tuple.

Let us go through tuple functions briefly:

Cmp(tuple1, tuple2)

Description

The method **cmp()** compares elements of two tuples.

Syntax

Following is the syntax for **cmp()** method:

```
cmp(tuple1, tuple2)
```

Parameters

- **tuple1** -- This is the first tuple to be compared
- **tuple2** -- This is the second tuple to be compared

Sr. No.	Function with Description
1	cmp(dict1, dict2) Compares elements of both dict.
2	len(dict) Gives the total length of the dictionary. This would be equal to the number of items in the dictionary.
3	str(dict) Produces a printable string representation of a dictionary
4	type(variable) Returns the type of the passed variable. If passed variable is dictionary, then it would return a dictionary type.

Let us go through these briefly:

Cmp(dict1, dict2)

Description

The method **cmp()** compares two dictionaries based on key and values.

Syntax

Following is the syntax for **cmp()** method:

```
cmp(dict1, dict2)
```

Parameters

- **dict1** -- This is the first dictionary to be compared with dict2.
- **dict2** -- This is the second dictionary to be compared with dict1.

Return Value

This method returns 0 if both dictionaries are equal, -1 if dict1 < dict2, and 1 if dict1 > dic2.

Example

60. type()

Description

The method **type()** returns the type of the passed variable. If passed variable is dictionary then it would return a dictionary type.

Syntax

Following is the syntax for **type()** method:

```
type(dict)
```

Parameters

- **dict** -- This is the dictionary.

Return Value

This method returns the type of the passed variable.

Example

The following example shows the usage of type() method.

```
#!/usr/bin/python


dict = {'Name': 'Zara', 'Age': 7};

print "Variable Type : %s" %  type (dict)
```

When we run above program, it produces following result:

```
Variable Type : <type 'dict'>
```

Python includes following dictionary methods:

Sr. No.	Methods with Description
1	dict.clear() Removes all elements of dictionary *dict*

2	dict.copy() Returns a shallow copy of dictionary *dict*
3	dict.fromkeys() Create a new dictionary with keys from seq and values *set* to *value*.
4	dict.get(key, default=None) For *key* key, returns value or default if key not in dictionary
5	dict.has_key(key) Returns *true* if key in dictionary *dict*, *false* otherwise
6	dict.items() Returns a list of *dict*'s (key, value) tuple pairs
7	dict.keys() Returns list of dictionary dict's keys
8	dict.setdefault(key, default=None) Similar to get(), but will set dict[key]=default if *key* is not already in dict
9	dict.update(dict2) Adds dictionary *dict2*'s key-values pairs to *dict*
10	dict.values() Returns list of dictionary *dict*'s values

Let us go through them briefly:

61. dict.clear()

Description

The method **clear()** removes all items from the dictionary.

Syntax