Python Regex findall()

Summary: in this tutorial, you'll learn how to use the Python regex `findall()` function to find all matches of a pattern in a string.

Introduction to the Python regex findall() function

The `findall()` is a built-in function (https://www.pythontutorial.net/python-basics/python-functions/) in the `re` module that handles regular expressions (https://www.pythontutorial.net/python-regex/python-regular-expressions/). The `findall()` function has the following syntax:

```
re.findall(pattern, string, flags=0)
```

In this syntax:

- `pattern` is a regular expression that you want to match.

- `string` is the input string

- `flags` is one or more regular expression flags (https://www.pythontutorial.net/python-regex/python-regex-flags/) that modify the standard behavior of the pattern.

The `findall()` function scans the `string` from left to right and finds all the matches of the `pattern` in the `string`.

The result of the `findall()` function depends on the pattern:

- If the `pattern` has no capturing groups (https://www.pythontutorial.net/python-regex/python-regex-capturing-group/), the `findall()` function returns a list (https://www.pythontutorial.net/python-basics/python-list/) of strings that match the whole pattern.

- If the `pattern` has one capturing group, the `findall()` function returns a list of strings that match the group.

- If the `pattern` has multiple capturing groups, the `findall()` function returns the tuples (https://www.pythontutorial.net/python-basics/python-tuples/) of strings that match the groups.

It's important to note that the non-capturing groups do not affect the form of the return result.

Python regex findall() function examples

Let's take some examples of using the `findall()` function.

1) Using the Python regex findall() to get a list of matched strings

The following example uses the `findall()` function to get a list of color names that start with the literal string `bl` :

```python
import re


s = "black, blue and brown"
pattern = r'bl\w+'
matches = re.findall(pattern,s)


print(matches)
```

Output:

```
['black', 'blue']
```

The following pattern matches a literal string `bl` followed by one or more word characters specified by the `\w+` rule:

```
'bl\w+'
```

Therefore, the `findall()` function returns a list of strings that match the whole pattern.

2) Using the findall() function with a pattern that has a single group

The following example uses the `findall()` function to get a list of strings that match a group:

```python
import re


s = "black, blue and brown"
pattern = r'bl(\w+)'
matches = re.findall(pattern,s)


print(matches)
```

Output:

```
['ack', 'ue']
```

This example uses the regular expression `r'bl(\w+)'` that has one capturing group `(\w+)`. Therefore, the `findall()` function returns a list of strings that match the group.

3) Using the findall() function with a pattern that has multiple groups

The following example uses the `findall()` functions to get tuples of strings that match the groups in the pattern:

```python
import re
```

```
s = "black, blue and brown"
pattern = r'(bl(\w+))'
matches = re.findall(pattern,s)


print(matches)
```

Output:

```
[('black', 'ack'), ('blue', 'ue')]
```

In this example, the pattern `r'(bl(\w+))'` has two capturing groups:

- `(\w+)` captures one or more word characters.

- `(bl(\w+))` captures the whole match.

4) Using the findall() function with a regular expression flag

The following example uses the `findall()` function with the `re.IGNORECASE` flag:

```
import re


s = "Black, blue and brown"
pattern = r'(bl(\w+))'
matches = re.findall(pattern, s, re.IGNORECASE)


print(matches)
```

Output:

```
[('Black', 'ack'), ('blue', 'ue')]
```

In this example, we use the `re.IGNORECASE` flag in the `findall()` function that ignores the character cases of the matched strings. Therefore, the output includes both `Black` and `blue` .

Summary

- Use the Python regex `findall()` function to get a list of matched strings.