Problem_2_File_Recursion

March 11, 2020

0.0.1 Analyze:

I need to find a recursion solution to solve the problem . so I need to solve smaller instances of the same problem. if there is one file in the folder. I need to find that file with a given "suffix" and return it. if there is one folder in the folder. I need to involve calling the function from within itself and wait to get "output" until searching all folders and return all the results.

Subtask: 1. find where invoking function 2. define base case 3. change input All operations take O(n) time complexity and there is an expanding char list, so the space complexity is O(n)

[157]:
```
import os

def find_files(suffix, path):
    """
    Find all files beneath path with file name suffix.

    Note that a path may contain further subdirectories
    and those subdirectories may also contain further subdirectories.

    There are no limit to the depth of the subdirectories can be.

    Args:
      suffix(str): suffix if the file name to be found
      path(str): path of the file system

    Returns:
       a list of paths
    """
    pathsList = []

    if os.path.isfile(path):
        if path.endswith(suffix):
            return[path]

    if os.path.isdir(path):
        for item in os.listdir(path):
            subPath = os.path.join(path, item)
            pathsList.extend(find_files(suffix, subPath))
```

```
    return pathsList
```

[158]:
```
find_files('.c','./testdir')
```

[158]:
```
['./testdir/subdir3/subsubdir1/b.c',
 './testdir/t1.c',
 './testdir/subdir5/a.c',
 './testdir/subdir1/a.c',
 './testdir/subdir1/b.c']
```

OS Module Exploration Code

[81]:
```
## Locally save and call this file ex.py ##

# Code to demonstrate the use of some of the OS modules in python

import os

# Let us print the files in the directory in which you are running this script
print (os.listdir("./testdir"))

# Let us check if this file is indeed a file!
print (os.path.isfile("./testdir/t1.c"))

# Does the file end with .py?
print ("./.py".endswith(".py"))
```

```
['subdir4', 'subdir3', 't1.c', 'subdir2', 'subdir5', 't1.h', 'subdir1']
True
True
```