😊 Opening and Reading Files

1. In this lab, we are going to learn about opening and reading files in advanced mode. We had already seen how to do that, but we will see all that in deep within this lab.
2. First, we looked at the current working directory, where we are working right now. Then we created a new file with name practice.txt and wrote something in it.

```
[1]: pwd
```

```
[1]: 'C:\\Users\\PULKIT\\project'
```

```
[3]: f = open('practice.txt','w+')
```

```
[5]: f.write('test')
     f.close()
```

3. The os module provides a way to interact with the operating system. The getcwd function returns the current working directory—the folder from which your Python script is running. This can be useful for constructing file paths dynamically or checking where your script is executing.

```
[7]: import os
```

```
[9]: os.getcwd()
```

```
[9]: 'C:\\Users\\PULKIT\\project'
```

4. Here we looked at what is inside our current working directory and then we listed the directory in our user's folder of our local system.

[11]:
```
# In your current directory
os.listdir()
```

[11]:
```
['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'opening-and-reading-files.ipynb',
 'practice.txt',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

[13]:
```
# In any directory you pass
os.listdir("C:\\Users")
```

[13]:
```
['All Users', 'Default', 'Default User', 'desktop.ini', 'Public', 'PULKIT']
```

5. You can use the built-in **shutil** module to move files to different locations. Keep in mind, there are permission restrictions, for example, if you are logged in a User A, you won't be able to make changes to the top level Users folder without the proper permissions.
6. This code uses the shutil module to move a file from one location to another. The move function is called with two arguments: the name of the file to be moved and the destination directory. This operation relocates the file (practice.txt) from its current location to the specified folder (C:\Users\PULKIT).
7. Below, you can see that we don’t have the file in our current directory now because it has been moved to another directory.

```
[15]: import shutil

[17]: shutil.move('practice.txt','C:\\Users\\PULKIT')

[17]: 'C:\\Users\\PULKIT\\practice.txt'

[19]: os.listdir()

[19]: ['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'opening-and-reading-files.ipynb',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

8. Then, we again used the **shutil** command to move the practice.txt file to the current working directory.

```
[21]: shutil.move('C:\\Users\\PULKIT\\practice.txt',os.getcwd())

[21]: 'C:\\Users\\PULKIT\\project\\practice.txt'

[23]: os.listdir()

[23]: ['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'opening-and-reading-files.ipynb',
 'practice.txt',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

9. Now there is an option to delete the files too. For that we need to install module called **send2trash.**
10. First, we installed send2trash using pip in our Python Notebook, then we imported it. After that, we listed the object in the directory, and we deleted the practice.txt file.

[25]:
```
! pip install send2trash
```

```
Requirement already satisfied: send2trash in c:\users\pulkit\anaconda3\lib\site-packages (1.8.2)
```

[27]:
```
import send2trash
```

[29]:
```
os.listdir()
```

[29]:
```
['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'opening-and-reading-files.ipynb',
 'practice.txt',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

[31]:
```
send2trash.send2trash('practice.txt')
```

[33]:
```
os.listdir()
```

[33]:
```
['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'opening-and-reading-files.ipynb',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

11. Often you will just need to "walk" through a directory, that is visit every file or folder and check to see if a file is in the directory, and then perhaps do something with that file. Usually recursively walking through every file and folder in a directory would be quite tricky to program, but luckily the **os module** has a direct method call for this called **os.walk ()**. Let's explore how it works.
12. First, we start by looking at the current working directory here, you can see that we have a folder named Example Top Level, this folder contains many files and folders inside it. Feel free to explore it first, then run the command.

```
[35]: os.getcwd()
```

```
[35]: 'C:\\Users\\PULKIT\\project'
```

```
[37]: os.listdir()
```

```
[37]: ['.ipynb_checkpoints',
 'build.properties',
 'cap.py',
 'Example_Top_Level',
 'opening-and-reading-files.ipynb',
 'simple1.py',
 'simple2.py',
 'target',
 'test_cap.py',
 'UnitTesting.ipynb',
 '__pycache__']
```

13. This code uses a directory-walking function to recursively traverse a folder named "**Example_Top_Level**". For each folder it visits, it prints the folder name, then lists its subfolders and files with indentation. This helps you see the hierarchical structure of directories and files within that top-level folder.

```
[39]: for folder , sub_folders , files in os.walk("Example_Top_Level"):

    print("Currently looking at folder: "+ folder)
    print('\n')
    print("THE SUBFOLDERS ARE: ")
    for sub_fold in sub_folders:
        print("\t Subfolder: "+sub_fold )

    print('\n')

    print("THE FILES ARE: ")
    for f in files:
        print("\t File: "+f)
    print('\n')

    # Now look at subfolders
```

```
Currently looking at folder: Example_Top_Level


THE SUBFOLDERS ARE:
         Subfolder: Mid-Example-One


THE FILES ARE:
         File: Mid-Example.txt


Currently looking at folder: Example_Top_Level\Mid-Example-One


THE SUBFOLDERS ARE:
         Subfolder: Bottom-Level-One
         Subfolder: Bottom-Level-Two


THE FILES ARE:
         File: Mid-Level-Doc.txt


Currently looking at folder: Example_Top_Level\Mid-Example-One\Bottom-Level-One


THE SUBFOLDERS ARE:


THE FILES ARE:
         File: One_Text.txt


Currently looking at folder: Example_Top_Level\Mid-Example-One\Bottom-Level-Two


THE SUBFOLDERS ARE:


THE FILES ARE:
         File: Bottom-Text-Two.txt
```