Modules & File Handling

🎯 Session Objectives:

- ✅ Understand and use built-in modules
- ✅ Read content from files using read(), readline(), and readlines()
- ✅ Understand the importance of closing files
- ✅ Write data to files and create new files
- ✅ Delete files

```
import datetime
dir(datetime.timedelta)
```

```
['__abs__',
 '__add__',
 '__bool__',
 '__class__',
 '__delattr__',
 '__dir__',
 '__divmod__',
 '__doc__',
 '__eq__',
 '__floordiv__',
 '__format__',
 '__ge__',
 '__getattribute__',
 '__getstate__',
 '__gt__',
 '__hash__',
 '__init__',
```

```
datetime.MAXYEAR
```

```
9999
```

```
datetime.MINYEAR
```

```
1
```

```
now = datetime.datetime.now()
now
```

```
datetime.datetime(2025, 9, 25, 21, 20, 40, 443948)
```

```
print(now)
```

```
2025-09-25 21:20:40.443948
```

```
today = datetime.datetime.today()
today
```

```
datetime.datetime(2025, 9, 25, 21, 6, 30, 744639)
```

```
print(today)
```

```
2025-09-25 21:06:30.744639
```

```
formatted = now.strftime("%Y-%m-%d %H:%M")
print(formatted)
```

```
2025-09-25 21:06
```

```
formatted = today.strftime("%A , %Y-%m-%d")
print(formatted)
```

```
Thursday , 2025-09-25
```

```python
# Dateadd() or Datediff()
from datetime import timedelta
tomorrow = today + timedelta(days = 1)
print(tomorrow)
```

```
2025-09-26 21:06:30.744639
```

```python
from datetime import timedelta
yesterday = today - timedelta(days = 1)
print(yesterday)
```

```
2025-09-24 21:06:30.744639
```

```python
from datetime import timedelta
change_in_second = now + timedelta(seconds = 600) # representing 10 minutes
print(change_in_second)
```

```
2025-09-25 21:30:40.443948
```

```python
# Parse a String into a Date
from datetime import datetime
formatted = datetime.strptime("2025-09-25 21:15:45" , "%Y-%m-%d %H:%M:%S")
print(formatted)
```

```
2025-09-25 21:15:45
```

```python
import random
dir(random)
```

```
['BPF',
 'LOG4',
 'NV_MAGICCONST',
 'RECIP_BPF',
 'Random',
 'SG_MAGICCONST',
 'SystemRandom',
 'TWOPI',
 '_ONE',
 '_Sequence',
```

```python
random.random() # float between 0 to 1 exclusive
```

```
0.7898936026745912
```

```python
random.randint(1,6) # Integers between 1 to 6 [Inclusive]
```

```
2
```

```python
random.randint(1,500) # Integers between 1 to 500 [Inclusive]
```

```
355
```

```python
random.uniform(0.11 , 9.99) # Float between provided range
```

```
3.3970382596800697
```

```
# choice
car_list = ['ScorpioN','Thar','Taigun','Slavia','Verna','Virtus','BMW','Creta',
            'Altroz','Curvv','Defender', 'Hummer', 'Innova', 'Hilux', 'Fortuner']

random.choice(car_list) # k = 1
```

```
'Defender'
```

```
random.choice(car_list)
```

```
'Virtus'
```

```
random.choice(car_list)
```

```
'ScorpioN'
```

```
random.choice(car_list)
```

```
'Hummer'
```

```
# choices [ask for a k-factor] [Random List with Repeats]
random.choices(car_list , k=5)
```

```
['Thar', 'BMW', 'ScorpioN', 'Verna', 'ScorpioN']
```

```
random.choices(car_list , k=5)
```

```
['Hummer', 'Virtus', 'Curvv', 'Slavia', 'Altroz']
```

```
random.choices(car_list , k=5)
```

```
['Creta', 'Creta', 'ScorpioN', 'Altroz', 'Defender']
```

```
_cards = ['Ace','2','3','4','5','6','7','8','9','10','Jack','Queen','King']
random.shuffle(_cards)
```

```
print(_cards)
```

```
['4', '5', 'Queen', '3', '6', '10', 'Jack', '8', '2', 'King', '9', '7', 'Ace']
```

```
random.shuffle(_cards)
print(_cards)
```

```
['4', '10', 'King', 'Queen', 'Jack', '5', '3', '9', 'Ace', '6', '8', '7', '2']
```

```
# Set seed for reproducibility:
random.seed(42)
random.random()
```

```
0.6394267984578837
```

```
random.seed(41)
random.random()
```

```
0.38102068999577143
```

```
random.seed(521)
random.random()
```

```
0.09984580427676737
```

```
random.random()
```

```
0.9791998280401679
```

```
random.seed(521)
random.random()
```

```
0.09984580427676737
```

```
# OS Module - Operating System Interface
import os
dir(os)
```

```
 'putenv',
 'read',
 'readlink',
 'remove',
 'removedirs',
 'rename',
 'renames',
 'replace',
 'rmdir',
 'scandir',
 'sep',
 'set_blocking',
 'set_handle_inheritable',
 'set_inheritable',
 'spawnl',
 'spawnle',
```

```
anaconda_projects/CN-Python-TTS/PythonSession-2.ipynb
```

```
os.getcwd()
```

```
'C:\\Users\\krish\\anaconda_projects\\CN-Python-TTS'
```

```
os.getcwdb()
```

```
b'C:\\Users\\krish\\anaconda_projects\\CN-Python-TTS'
```

```
os.listdir()
```

```
['.ipynb_checkpoints',
 'math_utils.py',
 'PythonSession-2.ipynb',
 'PythonSession.ipynb',
 'python_module.py',
 'string_utils.py',
 '__pycache__']
```

```
# mkdir -> Making Directory = [Folder]
os.mkdir("Coding_Ninja")
```

```
# rmdir -> Removing Directory
os.rmdir("Coding_Ninja")
```

```
# mkdir -> Making Directory = [Folder]
os.mkdir("Python_Folder")
```

```
# Trying to remove the filled folder
# rmdir -> Removing Directory
os.rmdir("Python_Folder") # OSError: [WinError 145] The directory is not empty: 'Python_Folder'
```

Syntax : File Handling

`open('<file_name>' , mode)`

1. 'x' -> Create (throws error if the file already exist)
2. 'w' -> 'write' (overwrite if the file exist)
3. 'r' -> 'read' (default)
4. 'a' -> 'append'

```
# File Handling
file = open('python.txt', 'x') # Create a new file in the current working directory
```

```
file.close()
```

```
# Replace ->
os.replace('python.txt', 'python_program.txt')
```

```
os.remove('python.txt') # FileNotFoundError
```

```
os.remove('python_program.txt') # Remove the file if exists.
```

```
# Creating a new File
file = open('program.txt', 'x') # Create a new file in the current working directory
```

```
file.close()
```

```
os.replace('program.txt', 'python_program.txt')
```

```
# .replace() will rename the file but not the content.........
```

```
os.remove('python_program.txt') # Remove the file if exists.
```

File Handling Continues.....

```
file = open('python.txt','x') # Creates File for the first time
```

```
file = open('python.txt', 'r') # Reading the file content
content = file.read()
content
```

```
''
```

```
file = open('python.txt','w') # Overwrite the exist content
content = file.write("We are learning File Handling in Python.") # 40 Length
print(content) # Length of a text
```

```
40
```

```
file.close() # This will close the current active file
```

```
file = open('python.txt', 'r') # Reading the file content
content = file.read() # Single Line Read
content
```

```
'We are learning File Handling in Python.'
```

```
file.close()
```

```
file = open('python.txt', 'r') # Reading the file content
content = file.read(15) # Single Line Read
content # 'We are learning'
```

```
'We are learning'
```

```
file.close()
```

```
file = open('python.txt', 'a') # Appending the new content within existing file
file.write('\nHello World')
file.write('\nPython Programming')
file.write('\nCoding Ninjas.....')
```

```
19
```

```
file.close()
```

```
file = open('python.txt', 'r') # Reading the file content
content = file.read() # Single Line Read
content
```

```
'We are learning File Handling in Python.\nHello World\nPython Programming\nCoding Ninjas.....'
```

```
file = open('python.txt', 'r') # Reading the file content
line1 = file.readline()
line2 = file.readline()
line3 = file.readline()
line4 = file.readline()
print('Line 1 : ' , line1)
print('Line 2 : ' , line2)
print('Line 3 : ' , line3)
print('Line 4 : ' , line4)
```

```
Line 1 :  We are learning File Handling in Python.

Line 2 :  Hello World

Line 3 :  Python Programming

Line 4 :  Coding Ninjas.....
```

```
file = open('python.txt', 'r')
lines = file.readlines()
print(lines)
```

```
['We are learning File Handling in Python.\n', 'Hello World\n', 'Python Programming\n', 'Coding Ninjas.....']
```

```
print(lines[0])
```

```
We are learning File Handling in Python.
```

```
print(lines[2])
```

```
Python Programming
```

```
print(lines[-1])
```

```
Coding Ninjas.....
```

```
file = open('python.txt', 'r')
lines = file.readlines()
for line in lines:
    print(line)
```

```
We are learning File Handling in Python.

Hello World

Python Programming

Coding Ninjas.....
```

```
file.close()
```

```
# try : except : finally
file = open('python.txt','r')
try :
    content = file.read()
    print(content)
finally:
    file.close()
```

```
We are learning File Handling in Python.
Hello World
Python Programming
Coding Ninjas.....
```

```
try :
    file = open('coding.txt','r')
    try :
        content = file.read()
        print(content)
    except IOError:
        print("IO Error Occurred!")
    finally :
        file.close()
except FileNotFoundError :
    print("Error : File Not Found") # ✅
```

```
Error : File Not Found
```

```
try :
    file = open('python.txt','w') # Overwrite my content with ''
    try :
        content = file.read()
        print(content)
    except IOError:
        print("IO Error Occurred!") # ✅
    finally :
        file.close()
except FileNotFoundError :
    print("Error : File Not Found")
```

```
IO Error Occurred!
```

```
try :
    file = open('python.txt','r')
    try :
        content = file.read()
        print(content) # ✅ " " - You know the reason
    except IOError:
        print("IO Error Occurred!")
    finally :
        file.close()
except FileNotFoundError :
    print("Error : File Not Found")
```

```

```

```
try :
    file = open('python.txt', 'a') # Appending the new content within existing file
    try :
        file.write('\nHello World')
        file.write('\nPython Programming')
        file.write('\nCoding Ninjas.....') # ✅
    except IOError:
        print("IO Error Occurred!")
    finally :
        file.close() # ✅
except FileNotFoundError :
    print("Error : File Not Found")
```

```
try :
    file = open('python.txt','r')
    try :
        lines = file.readlines()
        for line in lines:
            print(line) # ✅
    except IOError:
        print("IO Error Occurred!")
    finally :
        file.close()
except FileNotFoundError :
    print("Error : File Not Found")
```

```


Hello World

Python Programming

Coding Ninjas.....
```

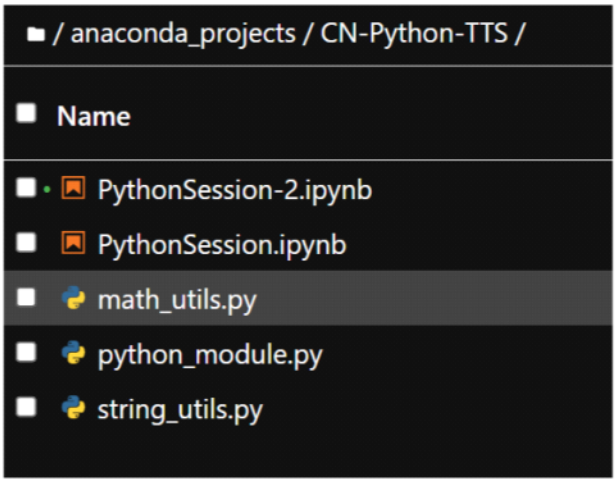
```
# Deleting a File
os.getcwd()
```

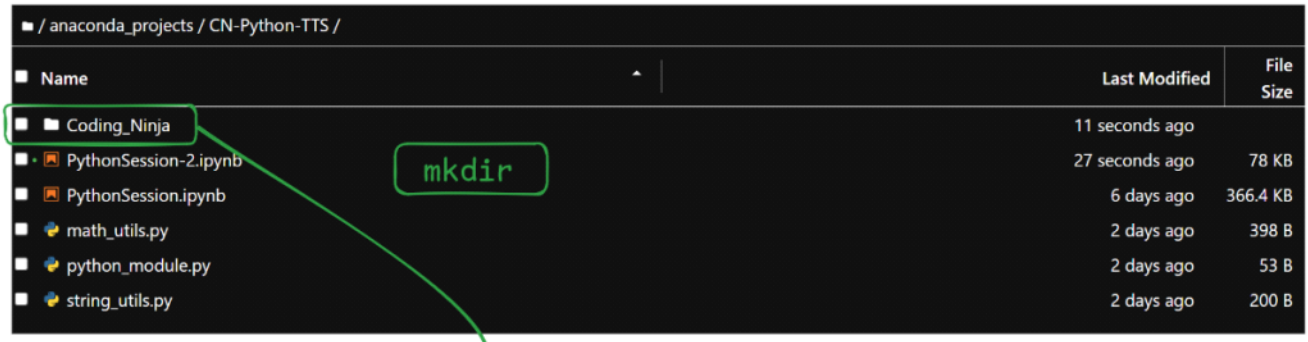
```
'C:\\Users\\krish\\anaconda_projects\\CN-Python-TTS'
```

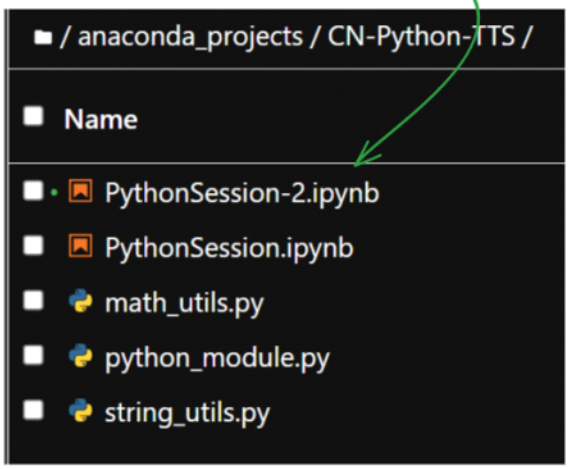
```
file_path = "anaconda_projects/CN-Python-TTS/python.txt"
```

```
file_path = "C:\\Users\\krish\\anaconda_projects\\CN-Python-TTS\\python.txt"
try:
    os.remove(file_path)
    print(f"{file_path} is removed.....")
except FileNotFoundError:
    print("Error: File Not Found!")
```

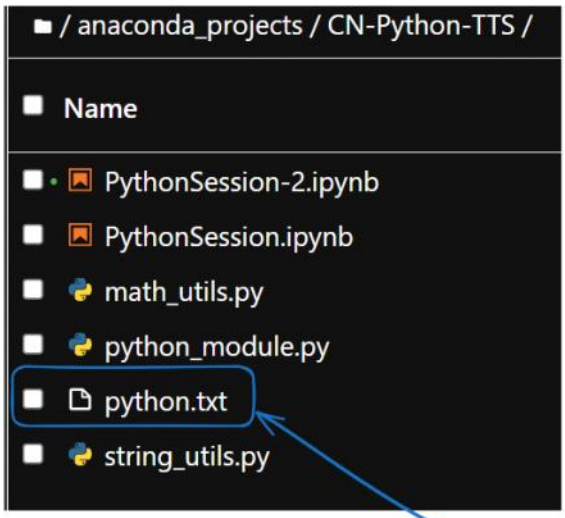
```
C:\Users\krish\anaconda_projects\CN-Python-TTS\python.txt is removed.....
```







Removing the directory using rmdir()

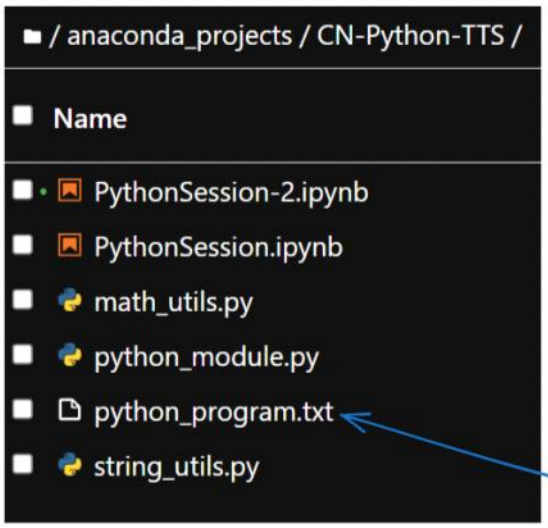


Syntax : File Handling

```
open('<file_name>' , mode)
```

1. 'x' -> Create (throws error if the file already exist)
2. 'w' -> 'write' (overwrite if the file exist)
3. 'r' -> 'read' (default)
4. 'a' -> 'append'

```
# File Handling
file = open('python.txt', 'x') # Create
```




```
# File Handling
file = open('python.txt', 'x') # Create a new fil

file.close()

# Replace ->
os.replace('python.txt', 'python_program.txt')
```