LECTURE

ELEVEN

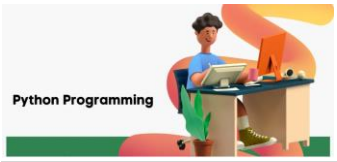
Files in Python

- Files are named locations on disk to store related information. They are used to permanently store data in a non-volatile memory (e.g. hard disk).
- When we want to read or write to a file, we need to **open** it first. When we are done, it needs to be **closed** so that the resources that are tied with the file are freed.

Opening Files in Python

Python has a built-in **open()** function to open a file. This function returns a file object, also called a handle, as it is used to read or modify the file accordingly. We can specify the mode while opening a file. In mode, we specify whether we want to read **r**, write **w.**

Character	Meaning
`'r'`	open for reading (default)
`'w'`	open for writing, truncating the file first
`'x'`	open for exclusive creation, failing if the file already exists
`'a'`	open for writing, appending to the end of the file if it exists
`'b'`	binary mode
`'t'`	text mode (default)
`'+'`	open a disk file for updating (reading and writing)



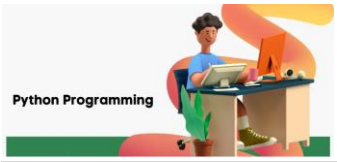
Example: Opening Files in Python

f = open("test.txt") # equivalent to 'r' or 'rt'
f = open("test.txt",'w') # write in text mode
f = open("img.bmp",'r+b') # read and write in binary mode
f = open("test.txt", mode='r', encoding='utf-8')

Closing Files in Python

- When we are done with performing operations on the file, we need to properly close the file.
- Closing a file will free up the resources that were tied with the file. It is done using the **close()** method available in Python.
- The best way to close a file is by using the **with statement.** This ensures that the file is closed when the block inside the with statement is exited.

Example: Closing Files in Python
f = open("test.txt", encoding = 'utf-8') f.close() with open("test.txt", encoding = 'utf-8') as f: # perform file operations



Writing to Files in Python

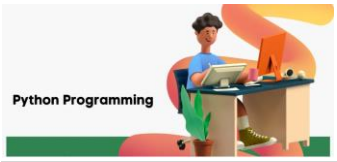
- In order to write into a file in Python, we need to open it in write **w**, append **a**.
- We need to be careful with the **w mode,** as it will overwrite into the file if it already exists. Due to this, all the previous data are **erased**.
- Writing a string is done using the **write() method**

Example: Writing to Files in Python

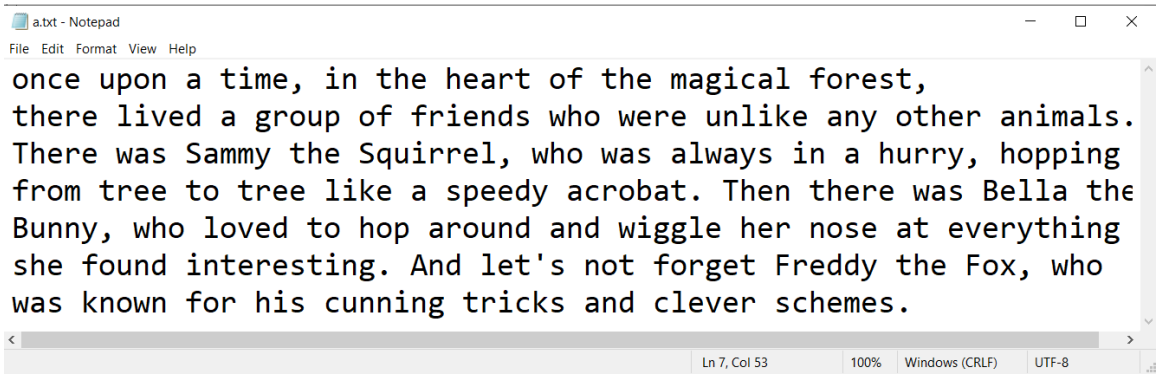
```
with open("test.txt",'w',encoding = 'utf-8') as f:
   f.write("my first file\n")
   f.write("This file\n\n")
   f.write("contains three lines\n")
```

Reading Files in Python

- To read a file in Python, we must open the file in reading r mode.
- There are various methods available for this purpose. We can use the **read(size)** method to read in the size number of data. If the size parameter is **not specified**, it reads and returns up to the end of the file.
- We can change our current file cursor (position) using the seek() method.
- Similarly, the tell() method returns our current position (in number of bytes).
- We can read a file line-by-line using a for loop. This is both efficient and fast.
- we can use the **readline()** method to read individual lines of a file.
- the **readlines**() method returns a list of lines of the entire file.



for example, a.txt



Example: Reading Files in Python

```
f = open("a.txt",'r',encoding = 'utf-8')
print(f.read(4) )  # read the first four characters  and print it
print(f.read())     # read in the rest till end of file and print it
```

Output:

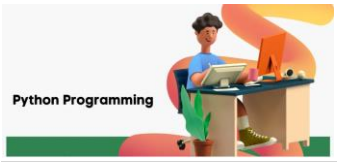
once upon a time,
in the heart of the magical forest,
there lived a group of friends who were unlike any other animals.
There was Sammy the Squirrel, who was always in a hurry, hopping
from tree to tree like a speedy acrobat. Then there was Bella the
Bunny, who loved to hop around and wiggle her nose at everything
she found interesting. And let's not forget Freddy the Fox, who
was known for his cunning tricks and clever schemes.

Example: Files tell and seek

```
f = open("a.txt",'r',encoding = 'utf-8')
print(f.tell())    # get the current file position and print it
f.seek(5)          # bring file cursor to initial position  5
print(f.tell())    # get the current file position and print it
```

Output:

0
5



Example: Files loop for

```
f = open("a.txt",'r',encoding = 'utf-8')
for line in f:
    print(line, end = '')
```

Output

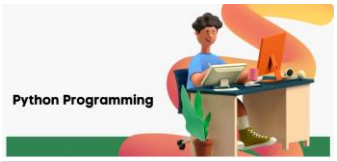
once upon a time, in the heart of the magical forest,
there lived a group of friends who were unlike any other animals.
There was Sammy the Squirrel, who was always in a hurry, hopping
from tree to tree like a speedy acrobat. Then there was Bella the
Bunny, who loved to hop around and wiggle her nose at everything
she found interesting. And let's not forget Freddy the Fox, who
was known for his cunning tricks and clever schemes.

Example: Files loop for with list

```
f = open("a.txt",'r',encoding = 'utf-8')
m=[]
for line in f:
     m.append(line)
print (m)
```

Output

['once upon a time, in the heart of the magical forest,\n',
'there lived a group of friends who were unlike any other animals.\n',
'There was Sammy the Squirrel, who was always in a hurry, hopping \n',
'from tree to tree like a speedy acrobat. Then there was Bella the \n',
'Bunny, who loved to hop around and wiggle her nose at everything \n',
"she found interesting. And let's not forget Freddy the Fox, who \n",
'was known for his cunning tricks and clever schemes.']



Example: Files readline and readlines

```
f = open("test.txt",'r',encoding = 'utf-8')
print(f.readline())
print(f.readlines())
```

Output

once upon a time, in the heart of the magical forest,
['there lived a group of friends who were unlike any other animals.\n', 'There was Sammy the Squirrel, who was always in a hurry, hopping \n', 'from tree to tree like a speedy acrobat. Then there was Bella the \n', 'Bunny, who loved to hop around and wiggle her nose at everything \n', "she found interesting. And let's not forget Freddy the Fox, who \n", 'was known for his cunning tricks and clever schemes.']

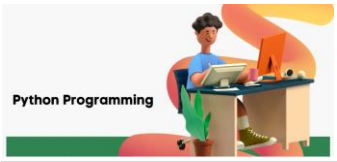
Examples on File in Python

Example(1): Write a Python program to read a file (test) line by line store it into List using user defined function.

```
def file_read(fname):
        ls = []
        with open(fname) as f:
                for line in f:
                        ls.append(line)
                print(ls)
file_read('test.txt')
```

Example (2): Write a Python program to generate 26 text files named a.txt, b.txt, and so on up to z.txt.

```
for i in range (97,123):
    s=chr(i)
    f= open(s + ".txt", "a")
```



REPORT

- Write a python program to find the longest words a text file.
- Write a Python program to copy the contents of a file to another file.
- Write a function in Python to count and display the total number of words in a text file.
- Write a function in Python to count words in a text file those are ending with alphabet "e".