An Introduction to STEM Programming with Python 3 – Chapter 10
Files

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In this video we will cover:

- ✔ Using Python's Context Manager to Clean-up

- ✔ Opening a File (for reading, writing, and appending)

- ✔ Writing Lines of Data to a File

- ✔ Reading a File in a Loop
  - for

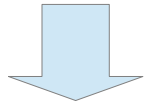- ✔ Reading One Line at a Time
  - readline

Open a File

- The "open" function is used to open a file stream
- A stream is a sequential collection of data that comes over a period of time.
- Open has two arguments
  - File path
  - Mode
    - r, w, a
    - b, t
- Returns a file pointer that must be closed.
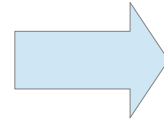
3

Using the Context Manager (with)

- It is recommended that we use a "context manager" when we open a file.

- with *function* as *variable*:
      suite...

- The context manager automatically closes the resource when we exit the suite.

Writing Data to a File

```
1  with open("numbers.txt","w") as f:
2      for n in range(100):
3          f.write(str(n) + "\n")
4  print("done")
```

done

File: numbers.txt
0
1
2
3
4
5

...

94
95
96
97
98
99

Using the for Statement to Read Stream

- The "for" statement will read a stream from beginning to end.

- Zero or more times

- Returns an entire line

  – As a string

  – Including end of line EOL

  – Use rtrim to remove it

Read Data from a File (for)

```
1 with open("numbers.txt","r") as f:
2     total = 0
3     for line in f:
4         total = total + int(line)
5 print("The total of the file is", total)
```

The total of the file is 4950

File: numbers.txt
0
1
2
3
4
5

...

94
95
96
97
98
99

Reading a File Using readline

- The readline method returns the next line in the file

  - As a string

  - With EOL character

  - Returns False when at the end of the file

Read Data from a File (readline)

```
1  with open("numbers.txt","r") as f:
2      total = 0
3      line = f.readline()
4      while line:
5          total = total + int(line)
6          line = f.readline()
7  print("The total of thr file is", total)
8
```

File: numbers.txt
```
0
1
2
3
4
5

...

94
95
96
97
98
99
```

The total of the file is 4950

References

- https://en.wikipedia.org/wiki/Stream_(computing)

Thank you

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