

File Handle as a Sequence

- A **file handle** open for read can be treated as a **sequence** of strings where each line in the file is a string in the sequence
- We can use the **for** statement to iterate through a **sequence**
- Remember - a **sequence** is an ordered set

```
xfile = open('mbox.txt')  
for cheese in xfile:  
    print(cheese)
```

Counting Lines in a File

- Open a **file** read-only
- Use a **for** loop to read each line
- **Count** the lines and print out the number of lines

```
fhand = open('mbox.txt')
count = 0
for line in fhand:
    count = count + 1
print('Line Count:', count)
```

```
$ python open.py
Line Count: 132045
```

Reading the *Whole* File

We can **read** the whole
file (newlines and all)
into a **single string**

```
>>> fhand = open('mbox-short.txt')
>>> inp = fhand.read()
>>> print(len(inp))
94626
>>> print(inp[:20])
From stephen.marquar
```

Searching Through a File

We can put an **if** statement in our **for** loop to only print lines that meet some criteria

```
fhand = open('mbox-short.txt')
for line in fhand:
    if line.startswith('From: ') :
        print(line)
```

OOPS! 1 of 2

What are all these blank
lines doing here?

```
From: stephen.marquard@uct.ac.za
```

```
From: louis@media.berkeley.edu
```

```
From: zqian@umich.edu
```

```
From: rjlowe@iupui.edu
```

```
...
```

OOPS! 2 of 2

What are all these blank lines doing here?

- Each line from the file has a **newline** at the end
- The **print** statement adds a **newline** to each line

```
From: stephen.marquard@uct.ac.za\n\nFrom: louis@media.berkeley.edu\n\nFrom: zqian@umich.edu\n\nFrom: rjlowe@iupui.edu\n\n...
```

Searching Through a File (fixed)

- We can strip the whitespace from the right-hand side of the string using `rstrip()` from the string library
- The newline is considered “white space” and is **stripped**

```
fhand = open('mbox-short.txt')
for line in fhand:
    line = line.rstrip()
    if line.startswith('From:') :
        print(line)
```

```
From: stephen.marquard@uct.ac.za
From: louis@media.berkeley.edu
From: zqian@umich.edu
From: rjlowe@iupui.edu
....
```

Skipping with Continue


We can conveniently skip a line by using the `continue` statement

```
fhand = open('mbox-short.txt')
for line in fhand:
    line = line.rstrip()
    if not line.startswith('From: ') :
        continue
    print(line)
```


Using **in** to Select **lines**


We can look for a string
anywhere **in** a **line** as our
selection criteria

```
fhand = open('mbox-short.txt')
for line in fhand:
    line = line.rstrip()
    if not '@uct.ac.za' in line :
        continue
    print(line)
```



```
From stephen.marquard@uct.ac.za Sat Jan  5 09:14:16 2008
X-Authentication-Warning: set sender to stephen.marquard@uct.ac.za using -f
From: stephen.marquard@uct.ac.za
Author: stephen.marquard@uct.ac.za
From david.horwitz@uct.ac.za Fri Jan  4 07:02:32 2008
X-Authentication-Warning: set sender to david.horwitz@uct.ac.za using -f...
```

```
fname = input('Enter the file name: ')\nfhnd = open(fname)\ncount = 0\nfor line in fhnd:\n    if line.startswith('Subject:') :\n        count = count + 1\nprint('There were', count, 'subject lines in', fname)
```



Prompt for File Name

Enter the file name: mbox.txt



There were 1797 subject lines in mbox.txt

Enter the file name: mbox-short.txt

There were 27 subject lines in mbox-short.txt

Bad File Names

```
fname = input('Enter the file name: ')
try:
    fhand = open(fname)
except:
    print('File cannot be opened:', fname)
    quit()

count = 0
for line in fhand:
    if line.startswith('Subject:'):
        count = count + 1
print('There were', count, 'subject lines in', fname)
```

Enter the file name: mbox.txt

There were 1797 subject lines in mbox.txt

Enter the file name: na na boo boo

File cannot be opened: na na boo boo

Summary

- Secondary storage
- Opening a file - file handle
- File structure - newline character
- Reading a file line by line with a for loop
- Searching for lines
- Reading file names
- Dealing with bad files



Acknowledgements / Contributions



These slides are Copyright 2010- Charles R. Severance (www.dr-chuck.com) of the University of Michigan School of Information and open.umich.edu and made available under a Creative Commons Attribution 4.0 License. Please maintain this last slide in all copies of the document to comply with the attribution requirements of the license. If you make a change, feel free to add your name and organization to the list of contributors on this page as you republish the materials.

Initial Development: Charles Severance, University of Michigan School of Information

... Insert new Contributors and Translators here