15-112 Fundamentals of Programming

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What are we doing today?

- File IO

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A short detour - So what are True and False?

- True is true
- False is false
- What about 1?
- What about 0?
- What about “”?
- What about “ “?

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The bool function

- bool(1) is True
- bool(0) is False
- bool(“”) is False
- bool(“ “) is True

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If and while

- In conditional execution

  if *condition*:

  - condition has to be Boolean – True or False
  - What would happen in:

```
if 0:
        print “testing 0”
if 1:
        print “testing 1”
if “”:
        print “testing empty”
if “ ”:
        print “testing space”
```

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Conditions

- Think of these statements as:

```
if bool( 0 ):
        print “testing 0”
if bool( 1 ):
        print “testing 1”
if bool( “” ):
        print “testing empty”
if bool( “ ” ):
        print “testing space”
```

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Open a file for reading

- open(filename)
  - Opens a file for reading
  - Returns a reference to the file that can be used to perform file operations:
    - read() – read the whole file
    - read(n) – return no more than n characters
    - readline() – return one line of text
    - readlines() – return all the file as a list of strings

Modes for files

- 'r' : use for reading
- 'w' : use for writing
- 'x' : use for creating and writing to a new file
- 'a' : use for appending to a file
- 'r+' : use for reading and writing to the same file

Open a file for writing

- open(filename, “w”)
  - Opens a file for writing
  - Returns a reference to the file that can be used to perform file operations:
    - write(s) – write string s to file
    - writelines(lst) – write list lst to file
    - close() – close the file for changes to reflect

Example – Reading a file

```
f = open("myfriends.txt")
line = f.readline()
while line:
    print (line)
    line = f.readline()
f.close()
```

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Example – Writing to a file

```
f = open("words.txt","w")
line = input("Enter some text> ")
while line != "stop":
    f.write(line)
    f.write("\n")
    line = input("Enter some text> ")
f.close()
```


Dealing with errors

```
reader = open('sometext.txt')
try:
    # read from file
finally:
    reader.close()
```

Dealing with errors

```
with open('somefile.txt','w") as fileout:
    # Further file processing goes here
```


Exercise 1

- Read each line from a file called "story.txt" and write each word from story.txt to another file "vocabularyfromstory.txt". Make sure no words are repeated.

What else can we do with files

- File name:
  + name function

  ```
  f = open("factorial.py")
  print "File name is", f.name
  ```
- seek function

  ```
  f = open("factorial.py")
  print "File name is", f.name
  f.seek(5,0)
  print f.readline()
  ```

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Seek function

- Seek (offset, from-what)
  - Offset is number of characters
  - From-what
    - 0 from the beginning
    - 1 from the current location
    - 2 from the end
    - Defaults to 0

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File functions

- mode
  - Which mode was used to open the file
- tell
  - What is the current cursor location

Working with the OS

- import os
  - chdir(path)
  - getcwd
  - mkdir
  - os.path.isfile
  - os.path.getsize
  - os.system

What is HTML?

- Hyper Text Markup Language

```
<HTML>

<TITLE> Hello World </TITLE>

<H1> Welcome to My Webpage </H1>

<img src="melatest.jpg“>

</HTML>
```

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How does the www work?

- You enter a URL in the address bar of your web browser
- The web browser fetches the index.html file from that location
- Index.html file has HTML code that is displayed by the web browser

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Reading webpages

- We can read web pages using Python
- We use the library called urllib.request.
- Open a url by using urlopen

```
p = urllib.request.urlopen ("http://www.cnn.com")
line = p.readline()
while line:
        print line
        line = p.readline()
```


Let's try reading your website

```
import urllib.request
andrewID = input("Enter andrew ID ")
p = urllib.request.urlopen("https://web2.qatar.cmu.edu/~"+andrewID)
line = p.readline()
while line:

    print line
    line = p.readline()
```