

## Exercise 15: Reading Files

Everything you've learned about `raw_input` and `argv` is so you can start reading files. You may have to play with this exercise the most to understand what's going on, so do it carefully and remember your checks. Working with files is an easy way to *erase your work* if you are not careful.

This exercise involves writing two files. One is your usual `ex15.py` file that you will run, but the *other* is named `ex15_sample.txt`. This second file isn't a script but a plain text file we'll be reading in our script. Here are the contents of that file:

```
This is stuff I typed into a file.  
It is really cool stuff.  
Lots and lots of fun to have in here.
```

What we want to do is "open" that file in our script and print it out.

However, we do not want to just "hard code" the name `ex15_sample.txt` into our script. "Hard coding" means putting some bit of information that should come from the user as a string right in our program. That's bad because we want it to load other files later. The solution is to use `argv` and `raw_input` to ask the user what file the user wants instead of "hard coding" the file's name.

```
1  from sys import argv
2
3  script, filename = argv
4
5  txt = open(filename)
6
7  print "Here's your file %r:" % filename
8  print txt.read()
9
10 print "Type the filename again:"
11 file_again = raw_input("> ")
12
13
```

```
14 txt_again = open(file_again)
15 print txt_again.read()
```

A few fancy things are going on in this file, so let's break it down real quick:

Lines 1-3 should be a familiar use of `argv` to get a filename. Next we have line 5 where we use a new command `open`. Right now, run `pydoc open` and read the instructions. Notice how like your own scripts and `raw_input`, it takes a parameter and returns a value you can set to your own variable. You just opened a file.

Line 7 we print a little line, but on line 8 we have something very new and exciting. We call a function on `txt`. What you got back from `open` is a `file`, and it's also got commands you can give it. You give a file a command by using the `.` (dot or period), the name of the command, and parameters. Just like with `open` and `raw_input`. The difference is that when you say `txt.read()` you are saying, "Hey txt! Do your read command with no parameters!"

The remainder of the file is more of the same, but we'll leave the analysis to you in the Study Drills.

## What You Should See

I made a file called "ex15\_sample.txt" and ran my script.

```
$ python ex15.py ex15_sample.txt
Here's your file 'ex15_sample.txt':
This is stuff I typed into a file.
It is really cool stuff.
Lots and lots of fun to have in here.
```

```
Type the filename again:
> ex15_sample.txt
This is stuff I typed into a file.
```

*It is really cool stuff.  
Lots and lots of fun to have in here.*

## Study Drills

This is a big jump so be sure you do this Study Drill as best you can before moving on.

1. Above each line, write out in English what that line does.
2. If you are not sure ask someone for help or search online. Many times searching for "python THING" will find answers for what that THING does in Python. Try searching for "python open."
3. I used the name "commands" here, but they are also called "functions" and "methods." Search around online to see what other people do to define these. Do not worry if they confuse you. It's normal for programmers to confuse you with their vast extensive knowledge.
4. Get rid of the part from lines 10-15 where you use `raw_input` and try the script then.
5. Use only `raw_input` and try the script that way. Think of why one way of getting the filename would be better than another.
6. Run `pydoc file` and scroll down until you see the `read()` command (method/function). See all the other ones you can use? Skip the ones that have `__` (two underscores) in front because those are junk. Try some of the other commands.
7. Start `python` again and use `open` from the prompt. Notice how you can open files and run `read` on them right there?
8. Have your script also do a `close()` on the `txt` and `txt_again` variables. It's important to close files when you are done with them.

## Common Student Questions

**Does `txt = open(filename)` return the contents of the file?**

No, it doesn't. It actually makes something called a "file object." You can think of it like an old tape drive that you saw on mainframe computers in

the 1950s, or even like a DVD player from today. You can move around inside them, and then "read" them, but the file is not the contents.

### **I can't type code into my Terminal/PowerShell like you say in Study Drill #7.**

First thing, from the command line just type `python` and hit Enter. Now you are in `python` as we've done a few other times. Once you have that you can just type in code and Python will run it in little pieces. Play with that. To get out of it type `quit()` and hit Enter.

### **What does `from sys import argv` mean?**

For now just understand that `sys` is a package, and this phrase just says to get the `argv` feature from that package. You'll learn more about these later.

### **I put the name of the file in as `script, ex15_sample.txt = argv` but it doesn't work.**

No, that's not how you do it. Make the code exactly like mine, then run it from the command line the exact same way I do. You don't put the names of files in, you let Python put the name in.

### **Why is there no error when we open the file twice?**

Python will not restrict you from opening a file more than once and in fact sometimes this is necessary.

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