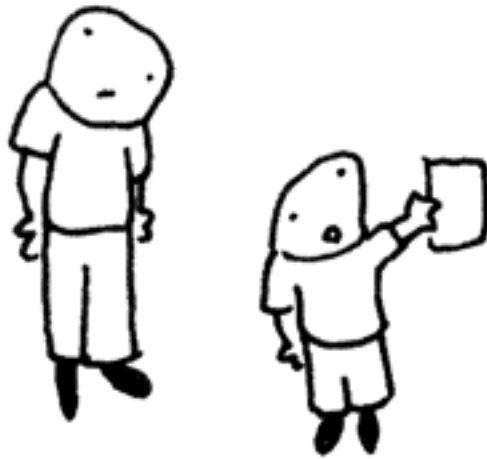


CSc 110, Autumn 2017

Lecture 19: While loops and File Input

Adapted from slides by Marty Stepp and Stuart Reges



okay dad. the science
fair is tomorrow. let's
make up some data.

File Input/output (I/O)

- **name** = `open("filename")`
 - opens the given file for reading, and returns a file object
- **name**.`read()` - file's entire contents as a string

```
>>> f = open("hours.txt")
>>> f.read()
'123 Brett 12.5 8.1 7.6 3.2\n
456 Sarina 4.0 11.6 6.5 2.7 12\n
789 Nick 8.0 8.0 8.0 8.0 7.5\n'
```

File paths

- **absolute path:** specifies a drive or a top "/" folder
 - `C:/Documents/smith/hw6/input/data.csv`
- Windows can also use backslashes to separate folders.
- **relative path:** does not specify any top-level folder names
 - `names.dat`
 - `input/kinglear.txt`
- Assumed to be relative to the *current directory*:
 - `file = open("data/readme.txt")`
 - If our program is in `H:/hw6`,
 - `open` will look for `H:/hw6/data/readme.txt`

split

You can use the `split` function to break a file apart

- `str.split()` – splits a string on blank space
- `str.split(other_str)` – splits a string on occurrences of the other string

```
>>> f = open("hours.txt")
>>> text = f.read()
'1\n2\n45\n6\n'

>>> f = text.split()
['1', '2', '45', '6']
```

Looping through a file

- The result of `split` can be used in a `for ... in` loop
- A template for reading files in Python:

```
file = open("filename")  
text = file.read()  
text = text.split()  
for line in text:  
    statements
```

File input question

16.2
23.5
19.1
7.4
22.8
18.5
-1.8
14.9

- We have a file `weather.txt`:
- Write a program that prints the change in temperature between each pair of neighboring days.

```
16.2 to 23.5, change = 7.3  
23.5 to 19.1, change = -4.4  
19.1 to 7.4, change = -11.7  
7.4 to 22.8, change = 15.4  
22.8 to 18.5, change = -4.3  
18.5 to -1.8, change = -20.3  
-1.8 to 14.9, change = 16.7
```

File input answer

```
# Displays changes in temperature from data in an input file.
```

```
def main():  
    input = open("weather.txt")  
    lines = input.read().split()  
    prev = float(lines[0])          # fencepost  
  
    for i in range(1, len(lines)):  
        next = float(lines[i])  
        print(prev, "to", next, ", change =", (next - prev))  
        prev = next
```

Gas prices question

- Write a program that reads a file `gasprices.txt`

- Format: *Belgium \$/gal*
US \$/gal
date

```
8.20
3.81
3/21/11
8.08
3.84
3/28/11
...
```

- The program should print the average gas price over all data in the file for both countries:

```
Belgium average: 8.3
USA average: 3.9
```


Gas prices solution

```
def main():
    file = open("gasprices.txt")
    belgium = 0
    usa = 0
    count = 0
    lines = file.read().split()

    for i in range(0, len(lines), 3):
        belgium += float(lines[i])
        usa += float(lines[i + 1])

    print("Belgium average:", (belgium / count), "$/gal")
    print("USA average:", (usa / count), "$/gal")
```