Strings and Files

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Reminders

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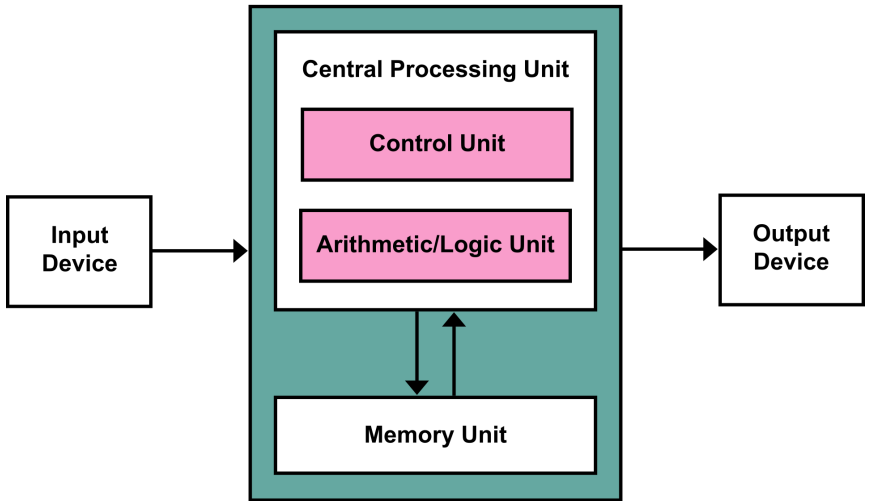
The following are due Friday

- Homework 9p1
- Participation 9p2
- Post-reading 9p2

Files

Why do we use files?

- Files are how data are stored on external storage
- Managed by O/S
- Disk is slow
- Opening files moves them to memory for the program
- Data is buffered (temporarily stored) in memory



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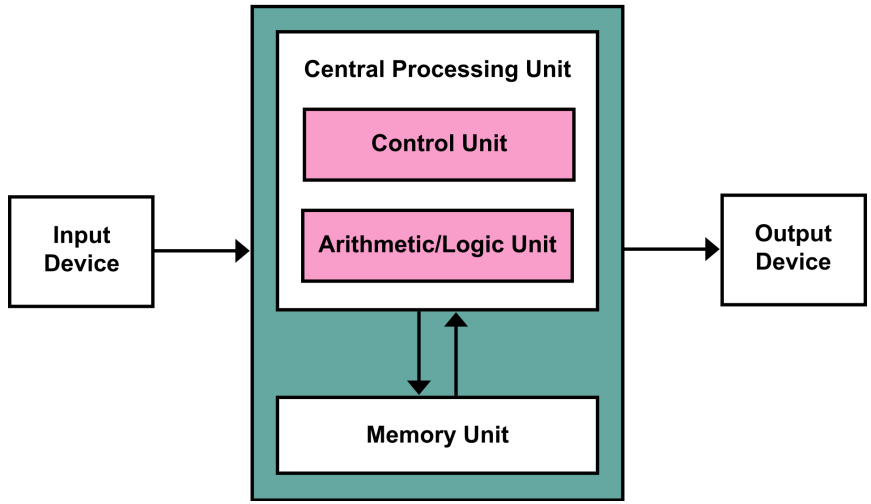

Let got over what a path is.

The OS Module: Path

- `os.stat()` → Returns all information on a file.
- `os.remove()` → Removes a file at a given path.
- `os.path.isfile()` → Test whether a path is a regular file
- `os.path.getsize()` → Return the size of a file, reported by os.stat().

The OS Module

The OS Module: Paths

- `os.path.split()` → Split a pathname. Returns tuple "(head, tail)" where "tail" is everything after the final slash. Either part may be empty.
- `os.path.exists()` → Test whether a path exists.
- `os.path.isfile()` → Test whether a path is a regular file
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- `os.path.sep` → Gives you the separator characer that is used on your system.

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Why do we need these?

Poll Question: Opening a File

How many times will this function call iterate if placed in a for loop: `os.walk("dev_website")`?

```
dev_website
|---index.html
|___elements
    |--- about.html
    |--- cv.html
    |___ projects.html

```

A. 1
B. 2
C. 6
D. 0

Reading Files

Poll Question: Opening a File

By default what does the `open()` function have it's file access permissions set as?

A. `Reading`
B. `Writing`
C. `Appending`
D. `Reading and Writing`
E. `Writing and Appending`
F. `Reading, Writing, and Appending`

Files

Which of the following reads all the contents of a file into a list of strings?

A. readlines
B. readall
C. read
D. readline

Poll Question: Read Characters

Given a variable named `file_object` that contains a file object which of the following will read the next 15 character into a variable named `title`.

A. `title = file_object.read(15)`

B. `title = file_object.read(14)`

C. `title = file_object.reads(15)`

D. `title = read(file_object, 15)`

Reading from Files

```
1 file_object = open('filename')
2 lines = file_object.readlines()
3 for line in lines:
4   print(line)
5 file_object.close()
```

Write Files

Poll Question: Files

Continue writing to existing files without overwriting the contents of the original file?

A. `outf = open('filename', 'r')`

B. `outf = open('filename', 'x')`

C. `outf = open('filename', 'a')`

D. `outf = open('filename', 'w')`

E. `outf = open('filename', 'w+')`

Poll Question: Files

Read from a file that may not exist?

A. `outf = open('filename', 'r+w')`

B. `outf = open('filename', 'rw')`

C. `outf = open('filename', 'r')`

D. `outf = open('filename', 'r+')`

E. `outf = open('filename', 'w+')`

Writing to Files

```
1 file_object = open('filename', 'w')
2 file_object.write('thing to write')
3 file_objet.close()  #automatic at program end
4 file_object.flush() #optional
```

Patterns Continued

Finding (single thing) in a Collection

```
def find_thing(collection):
  for thing in collection:
    if <thing meets condition>:
      return thing
```

```
def find_thing(collection):
  found = None
  for thing in collection:
    if <thing meets condition>:
      found = thing
      break
  return found
```

Filtering a collection

```
12 def filter(collection):
13   new_list = []
14
15   for thing in collection:
16     if <thing meets criteria>:
17       newlist.append(thing)
18
19   return new_list
```

Patterns and Files

Usual Sum/Total:

```
1 def foo(some_list):
2   total = 0
3   for item in
      some_list
4     total += item
5   return total
```

Sum/Total Pattern w/ File:

```
1 def foo(filename):
2   file_object = open(filename)
3   lines = file_object.readlines()
4   total = 0
5   for line in lines:
6     total += int(line)
7   return total
```