LING 300 - Topics in Linguistics:
Introduction to Programming and Text Processing for Linguists

Week 5

Basic Python cont. (More Assignment 3 Notes)

Going out today

- Survey:
  - Midterm self-evaluations
  - Midterm course feedback
  - Final project ideas?
- Final project note:
  - There will be a default assignment
  - But it will be much more self-directed than usual

Notes from Assignment 3

All Assignment 3s graded on Quest,

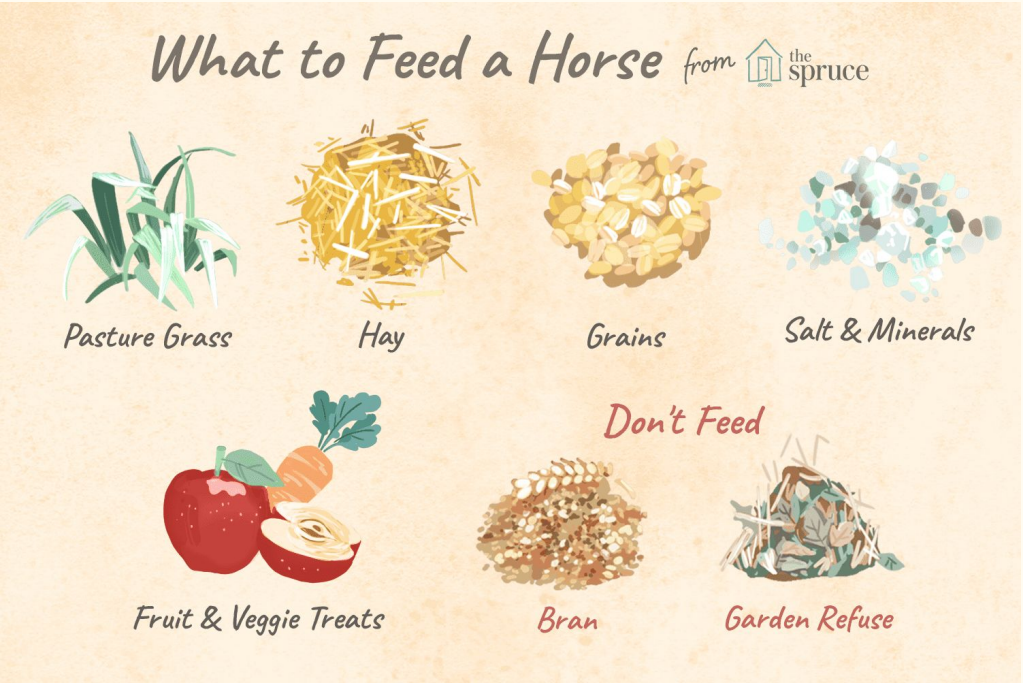
`[netid]/assignment3/assignment3_graded.py`

In-line comments as usual:

```
### [TS] This and that and the other
```

Notes from Assignment 3

(Feeding a fed horse)



PLEASE
MAKE
SURE
YOUR
ASSIGNMENT
RUNS!

`PYTHON ASSIGNMENT4.PY!!`

Notes from Assignment 3

-

- `for line in open(f)` Does not strip whitespace!
  - If you got 5-letter palindromes using min_length, this is because each line has ‘\n’ on the end!

Notes from Assignment 3

- `and` is not distributive
  - `type(d1) and type(d2) == int`
    is not the same as
    `type(d1) == int and type(d2) == int`
- The results of comparisons can be returned directly
  - E.g., no need for
    `if x == y return True else return False`
    Just do `return x == y`

Notes from Assignment 3

- `for` loops implicitly have a unit of operation:
  - For lists, `['abc', 123, 'you n me']`
    - List item `'abc' -> 123 -> 'you n me'`
  - For strings, `'ling300'`
    - Character `'l' -> 'i' -> 'n' -> 'g'`
  - For file objects, `open(f)`
    - Line

Notes from Assignment 3

`==` vs. `is`

Logical equality Object equality

```
>>> a = [1,2]
>>> b = [1,2]
>>> a == b   # are these logically equivalent?
True
>>> a is b   # are they the exact same object?
False
```

Notes from Assignment 3

- There's a near-infinite variety of ways to do most things.

- Example: `reverse_string`
  - `s[::-1]`
  - `l = list(s), while len(l) > 0, l.pop()`
  - `l = list(s), l.reverse(), ' '.join(l)`
  - `i = len(s) - 1, while i > 0, i -= 1`
  - `new_s = '', for c in s, new_s = c + new_s`

Notes from Assignment 3

- Efficiency: not a huge deal for now, but be aware!
  e.g. consider how many times we loop over what

Which is better?

```
for word in s.split():          vs.  for word in stopwords:
    if word in stopwords:                    if word in s.split():
```

- Anti-corollary: “Don’t optimize prematurely”
  Doing it whichever way is fine, until it gets too slow to work

Style Notes from Assignment 3

- Standards? Somewhat, e.g. style guide: https://www.python.org/dev/peps/pep-0008/
- Opinions? Many!

- Key consideration is **readability.**
  - Other people may have to read your code
  - You may have to read your own code in five years

Style Notes from Assignment 3

- Readability Basics:
  - `# comments are good practice to explain the`
    `# purpose and functionality of more`
    `# complicated bits`
  - The best code is also somewhat “self-documenting”
  - Variable names are a form of comment
  - Logical decomposition helps readability

Style Notes from Assignment 3

- Consider:

```
a = sum(vals)
b = len(vals)          vs.   return sum(vals)/len(vals)
return a/b


length1 = len(s1)
length2 = len(s2)       vs.  if len(s1) > len(s2):
if length1 > length2:              ...
    ...
```

Style Notes from Assignment 3 (cont.)

- Variable naming: try not to overload (one name does one thing)

```
document = open(f)                      # file object
document = document.read()              # string
document = letters_only(document)       # string
document = document.split()             # list
```

vs.

```
document = open(f)                      # file object
text = letters_only(document.read())    # string
words = document.split()                # list
```

Style Notes from Assignment 3 (cont.)

- Variable naming: try not to overload (one name does one thing)
  - Special case of this: `.join()`

    🚫
    ```
    output = ' '
    output = output.join(words)
    ```

  - Both ‘`output`’s are strings, but they’re different - first is the delimiter, second is the actual output. Just do:

    ✅
    ```
    output = ' '.join(words)
    ```

Advanced Syntactic Sugar

- List Comprehension

```
output = ' '.join([c for c in s if c.isalpha()])
```

- Ternary Conditional Assignment

```
x = 0 if random.random() > 0.3 else 1
```

- Step slicing:

```
my_string[start:end:step]
```

When You're Stuck!

- `help(the_thing)`
- Read error messages carefully
- Carefully re-read the problem
- Talk your code out loud
- https://docs.python.org/3/
- Piazza (try to explain the issue)
- Google it! (totally fine)
- Take a break
  (or skip the problem for now)
  and try again later