Python Style: Readability

Context

When we study a foreign language we learn:
- the rules to spell words and construct correct sentences   - this is **syntax**.
- the meanings of words and how to interpret sentences   - this is **semantics**.
- how language reflects an author's personality and audience - this is **style**.

In CS courses, we study the syntax, semantics, and style of programming languages.
This activity assumes you are familiar with **syntax** and **semantics** and focuses on **style**.

In this activity, we'll be looking at what makes code **readable**, specifically when using variables and expressions.

Exercises

1.

```
X  i1 = 10
   i2 = 5
   c1 = 9.99
   c2 = 4.99
   d1 = 0.06
   d2 = 0.99
   s1 = i1*c1+i2*c2
   t1 = s1+s1*d1+i1*d2
```

```
Y  num_cd = 10
   num_mp3 = 5
   cost_cd = 9.99
   cost_mp3 = 4.99
   ship_cd = 0.99
   rate_tax = 0.06
   sub_cost = (num_cd * cost_cd) + (num_mp3 * cost_mp3)
   sub_ship = num_cd * ship_cd
   sub_tax = sub_cost * rate_tax
   total = sub_cost + sub_tax + sub_ship
```

Which code block on page 1 (X or Y):

a.	Is shorter and would take less time to type?	
b.	Uses more variables?	
c.	Would be easier to edit or debug?	

2.

```
X def foo(s):
      if len(s) <= 2:
          return s
      first = s[0]
      last = s[len(s) - 1]
      mid = s[1:len(s) - 1]
      halfway = len(mid) // 2
      return first + mid[halfway:] + mid[:halfway] + last


Y def foo(s):
      if len(s) <= 2:
          return s
      return (s[0] + s[1:len(s) - 1][(len(s) - 2) // 2:] +
              s[1:len(s) - 1][:(len(s) - 2) // 2] + s[len(s) - 1])
```

Which code block for **foo(s)** (X or Y):

a.	Is shorter and would take less time to type?	
b.	Uses more variables?	
c.	Would be easier to edit or debug?	

3. For each item below, choose the better option: X, Y, or ? (can't decide).

	Option X	Option Y	X/Y/?
a.	`i1 = 3` `i2 = 7`	`num_closed = 3` `num_open = 7`	
b.	`num_cat = 2` `num_dog = 5`	`num_cat = 2` `dog_num = 5`	
c.	`numson = 3` `isdone = True`	`num_son = 3` `is_done = True`	

4. Based on your answers to questions 1-3, summarize style advice for working with variables.

5. For each item below, choose the better option: X, Y, or ? (can't decide).

	Option X	Option Y	X/Y/?
a.	`s1 = (i1 * c1) + (i2 * c2)`	`s1 = i1 * c1 + i2 * c2`	
b.	`s1 = c1 * i1 + i2 * c2`	`s1 = i1 * c1 + i2 * c2`	

c.	`total = n_cd * s_cd + (n_cd`
	`    * c_cd + n_mp3 *`
	`    c_mp3) * (1 + rate_tax)`
		`cost = (n_cd * c_cd) + (n_mp3`
		`      * c_mp3)`
		`ship = n_cd * s_cd`
		`tax = cost * rate_tax`
		`total = cost + tax + ship`	

6. Based on your answers to question 5, summarize advice for writing expressions.