Variables & Assignment

COSC 101: Intro to Computing I
September 4, 2017
Variables
1. What is an **object** in Python? Provide examples.

2. What object **classes** have you seen?

3. Why would you want to **convert** an object from one class to another? And what functions would you use to do so?
Assignment
1. What does an assignment statement do?

2. Why would we want to use variables?

3. Are Python variables the same as variables you have used in math courses?

4. Does it matter which side of the assignment token the name is on and which side the value is on? If so, which sides should they be on?
5. Which of the following are valid variable names? If a name is invalid, explain why.

1. 3_num_avg
2. avg_of_3_nums
3. average of three numbers
4. avgOf3nums
5. avg_of_three_numbers
6. avgOfThreeNumbers
6. What is the difference between the operators: * and **?

7. What is the difference between the operators: / and //?

8. What is the difference between the operators: // and %?
Practice Problems
1. What is the output of the following? If an error occurs, which type of error?

```python
>>> len("1234567890")
```
2. What is the output of the following? If an error occurs, which type of error?

```python
>>> print(type("This is the best class ever!"))
```

```
type('str')
```
3. What is the output of the following? If an error occurs, which type of error?

```python
>>> 1234 = x
>>> print(x)
```
4. What is the output of the following?
If an error occurs, which type of error?

```python
>>> random = 'hello'
>>> random = 'my'
>>> random = 'name'
>>> random = 'is'
>>> print(random)
```

Output: 
```
Hello
```
5. What is the output of the following? If an error occurs, which type of error?

```python
>>> x = 3
>>> y = '4'
>>> z = x + y
>>> print(z)
```

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6. What is the output of the following?
If an error occurs, which type of error?

```python
>>> sams$ = 34.56
>>> jacks$ = 55.63
>>> print('Together Sam and Jack have', sams$+jacks$, 'dollars')
```

The output is:

```
Together Sam and Jack have 89.19 dollars
```
7. What is the output of the following? If an error occurs, which type of error?

```python
>>> name1 = 'Alice'
>>> name2 = 'Bob'
>>> college = 'Colgate University'
>>> print(name1, "met", name2, "'at'"", college, "'and they became best friends.'")
```
8. What is the output of the following? If an error occurs, which type of error?

```python
>>> a = 3
>>> print('a is a', type(a))
>>> str(a)
```
9. What is the output of the following?
If an error occurs, which type of error?

```python
>>> length = len('three')
>>> print('the length of three is', length)
>>> length_plus_seven = length + 7
>>> print('plus seven =', plus_seven)
```
10. What is the output of the following? If an error occurs, which type of error?

```
>>> a = 6 / 7
>>> print(a)
>>> b = 6 // 7
>>> print(b)
>>> c = 6 % 7
```
Consider these five expressions:

- $252 \% 2$
- $21.0 / 28.0$
- $15 \% 6$
- $15.0 / 5.0$
- $3 / 4$

Which value occurs more than once?

1. 0
2. 0.75
3. 3
4. No duplicate values
5. I’m not sure.
What does this expression evaluate to?

```python
>>> 1 * 2 + 3 * 6 % 4
```

1. 0
2. 2
3. 4
4. 8
5. I’m not sure.
Consider these five expressions:

- $252 \% 2$
- $21.0 / 28.0$
- $15 \% 6$
- $15.0 / 5.0$
- $3 / 4$

Which value occurs more than once?

1. 0
2. 0.75
3. 3
4. No duplicate values
5. I’m not sure.
Recall that the volume of a sphere is \( \frac{4}{3} \pi r^3 \)

```python
>>> radius = 1
>>> volume = 1/3 * 3.14159 * radius ** 3
```

What type of error is in the above program?

1. syntax
2. runtime
3. semantic
4. no error
5. other