

Exercises for Deck 005

Python Variables

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- 1) In programming, the `_` underscore character is usually considered a (pick one):
 - a) number
 - b) symbol
 - c) letter
 - d) control
 - e) space
- 2) Use the python reference at docs.python.org to determine which of these are keywords:
try count break word int is program

and dir sum subtract score new pass

raise continue class teacher student random that
- 3) Circle the characters that an identifier can begin with:
a 2 あ я . Z - _ * (c ç
- 4) Numbers always start with a (circle one):
 - a) space
 - b) symbol
 - c) digit
 - d) letter
 - e) operator
 - f) control
- 5) Use the python reference at docs.python.org to determine which of these are builtins:
abs log dir int info str string from
help page read write print input output float
- 6) Explain why it's important to avoid names like "a" and "i":
- 7) Write a name available in every Python program that starts with a `_` ?

8) Circle the following identifiers that are in snake case:

tempData newword original_data dataStr DataReader write_info

9) In python what kind of syntax is = (a single equals sign)?

10) Draw a circle around each statement.

```
n % 2 == 0
n != 1:
n % 2 == 0:
n = (
    n // 2
)
n = 3 * (
    n + 1 )
print( n ) # show our progress
print ( n
+ steps
+ i
+ m
)
```

a) label the statements you circled above with either assignment or expression

11) The thing on the left side of the = is called:

12) The thing on the right side of the = is called:

13) What happens to the result of an expression statement if its not in the REPL?

14) Make a box diagram with one variable "score" that refers to the int 1000

15) What are the three parts of your box diagram for the previous question called? Label them.

16) List everything you can think of that is different (contrast) between the two following Python statements:

```
word = "bird"
```

```
word == "bird"
```

17) What can you use the `dir` built-in function for ?

18) Draw a box diagram of the program's memory after line 3: (you can skip the `_` variables)

```
1 word = "chartreuse"
2 guess = input("I'm thinking of a word, guess what it is: ")
3 print("your guess was " + str(word == guess))
4 |
```

19) Contrast the difference between what happens when an assignment statement assigns a variable that:

already exists

doesn't already exist

20) Consider the following program:

```
exercise005b.py
1  # compute simple interest
2  principal = input("Enter the loan amount: ")
3  years = 10
4  percent = 5
5  print(principal * years * rate / 100)
```

- a) Convert the program to "Functional Style"

- b) Convert the program to "Three Address Style"

- c) Make a box diagram for the program's memory at the end of your "Three Address Style" version!

21) Write a box diagram for the program's memory after line 4:

```
1  maximum = 1
2  limit = maximum
3  minimum = limit
4  maximum = 2
```

- a) What happens to minimum and limit when Python executes line 4?
- b) What happens to maximum when Python executes line 4?

22) Explain the differences between the `is` and `==` operators.

- a) Do they have the same precedence?
- b) Syntactically, how many sides do they have?
- c) What is the difference between the operations performed?

23) Which should usually be used to compare the following, `is` or `==`?

- | | | |
|----------------------|-----------------|-----------------|
| a) None | <code>is</code> | <code>==</code> |
| b) True | <code>is</code> | <code>==</code> |
| c) 200 | <code>is</code> | <code>==</code> |
| d) "vermillion" | <code>is</code> | <code>==</code> |
| e) 3.141592653589793 | <code>is</code> | <code>==</code> |