Variables

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Variables

A variable is a container/box for storing a data value.

An Example

```
x = 1
```

- What does this mean? Any thoughts?
- What does "=" mean? Please clarify.

"=" might be mind-blowing for kiddos

It was definitely mind-blowing for me when I was 18.

- In programming, "=" is for **assign**, NOT for **equal**
- Put the data from the right side to the left side

A Few Examples

```
x =1
print(x)
```

```
x = 1
y = x
print(x)
print(y)
```

```
x = 1
y = x + 1
print(x)
print(y)
```

A Few Examples

```
x = 1
x = x + 1
print(x)
```

```
name = input("please enter your name")
print(name)
```

Rules for Python Variables (Not Important. Just FYI)

- A variable name must start with a letter or the underscore character
- A variable name cannot start with a number
- A variable name can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)
- Variable names are case-sensitive (age, Age and AGE are three different variables)

Why do we need variables?

Can't we just work on numbers?

```
x = 100
y = 200
z = x + y
print(z)
```

Why bothoring? I can simply write the following and I still rock!

```
z = 100 + 200
print(x)
```

Why do we need variables?

A math puzzle:

- The first number is 2345
- The second number 5432
- What is the result when you add these two numbers, their mutiplication result, the first one times 12, and the second one times 50?

Why do we need variables?

Easy Peasy Lemon Squezzy!

```
result = 2345  + 5432 + 2345 * 5432 + 2345 * 12 + 5432 * 50
print(result)
```

Why do we need variables?

But I may have the same type puzzle with different values for the first number and second number.

Aother one: The first number is 234; The second number 543; ....
Yet another one: The first number is 666; The second number 888; ....
Yet another one: The first number is 777; The second number 999; ....

Why do we need variables?

What's the problem now?

```
result = 234  + 543 + 234 * 543 + 234 * 12 + 543 * 50
print(result)
```

```
result = 666  + 888 + 666 * 888 + 666 * 12 + 888 * 50
print(result)
```

```
result = 777  + 999 + 777 * 999 + 777 * 12 + 999 * 50
print(result)
```


Fvnsdkjfhn;kv
fnRVJKNKDSH
GWBIUFGHWE
OGBE4UfvhbkU
BHFIUBHWE'BV
NFPOJOPEIrje

Why do we need variables?

They help to isolate the pattern of calculation from the specific numbers for this example. **So that you can reuse your code!**

```
num1 = 2345
num2 = 5432
result = num1  + num2 + num1 * num2 + num1 * 12 + num2 * 50
print(result)
```

And it eases your life!

```
num1 = 234
num2 = 543
result = num1  + num2 + num1 * num2 + num1 * 12 + num2 * 50
print(result)
```

```
num1 = 666
num2 = 888
result = num1  + num2 + num1 * num2 + num1 * 12 + num2 * 50
print(result)
```

```
num1 = 777
num2 = 999
result = num1  + num2 + num1 * num2 + num1 * 12 + num2 * 50
print(result)
```

Questions?

Quiz

Quiz 1:

- The first number is 333
- The second number is 444
- The addition of 1) the first number times the second number, 2) the square of the first number, and 3) the square of the second number.
  - 333 * 444 + 333 * 333 + 444* 444
- Print the result

Quiz 2: Repeat Quiz 1 using two different numbers: 111 and 222

Another Exercise

```
x = 111
y = 888
print(x)
print(y)

#write your code here

print(x)
print(y)
```

Complete the code here to swap values in *x* and *y*.

Homework

```
x = 111
y = 222
z = 333
print(x)
print(y)
print(z)
#write your code here
print(x)
print(y)
print(z)
```

After your code executes, x will have y's value, y will have z's value, and z will have x's value.

Questions?