

# Python vs. BYOB

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1. Get a laptop
  2. Go to <http://www.skulpt.org/>
  3. On the right side, type  

```
print("hello world")
```
  4. Press enter
  5. Play with some math!  
Try typing “4+3” and pressing enter  
Try “300/55”, try “7\*4”, try “5\*3-1”
-

# Hello Word!

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A “hello world” program is a simple program that only outputs the words “hello world”

It’s used to as a simple test/example to make sure everything is working correctly

BYOB



Python

```
print("Hello World")
```

# Hello Word!

---

The first “hello word” program was in a 1974 Bell Laboratories internal document called *Programming in C: A Tutorial*.

It looked like this:

```
main () {  
    printf("hello, world");  
}
```

[Wikipedia](#)

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# Assembly language

---

```
CR      EQU    $0D          ; carriage return
PROUT   EQU    $xxxx       ; character output routine
;
        LD     HL,MSG       ; Point to message
;
PRLOOP  LD     A,(HL)        ; read byte from message
        AND    A            ; set zero flag from byte read
        RET    Z            ; end of text if zero
        CALL  PROUT         ; output char
        INC   HL            ; point to next char
        JR    PRLOOP        ; repeat
;
MSG      DB     "Hello, world!",CR,0
;
```

# Java

---

```
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, world!");  
    }  
}
```

# JavaScript

---

```
console.log('Hello, world!');
```

OR

```
alert('Hello, world!');
```

# JavaScript - Let's try it!

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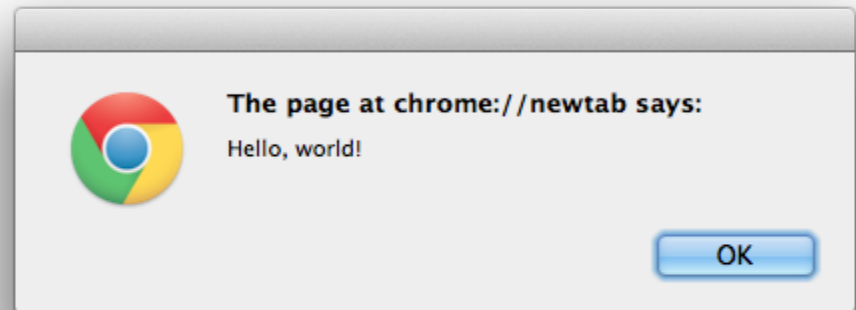
Open Chrome

Go to View > Developer > JavaScript Console

In the console type:

```
alert('Hello, world!');
```

You should see  
something like this!



# Lisp

---

```
(princ "Hello, world!")
```

Scheme (very similar to Lisp):

```
(display "Hello, world!")
```

Lisp: [Wikipedia](#) Scheme: [Wikipedia](#)

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# Objective-C (iPhone Apps)

---

```
#import <stdio.h>
```

```
int main(void)
```

```
{  
    printf("Hello, world!\n");  
    return 0;  
}
```

[Wikipedia](#)

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# PHP

---

```
<?php echo 'Hello, world!' ?>
```

Fun Fact:

PHP was created by Rasmus Lerdorf, who now works at Etsy!

[Wikipedia](#)

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# Ruby

---

```
puts "Hello, world!"
```

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**Languages are mostly  
the same**

**If you learn one, you can  
do the same things in  
another language.**

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# Say hello to you

---

BYOB



Python

```
name = raw_input("What's your name?")  
print("Hi, " + name)
```

# Let's try it!

---

1. Go back to **www.repl.it/languages/Python**
2. Type this on the left side

```
name = raw_input("What is your name?")  
print("Hi, " + name)
```

3. Press the play button



# Variables

---

Make a variable

set **x** to 0

```
name = "amy"
```

```
x = 0
```

```
index = 1
```

```
letter = "A"
```

change **x** by 1

```
x += 1
```

```
x = x + 1
```

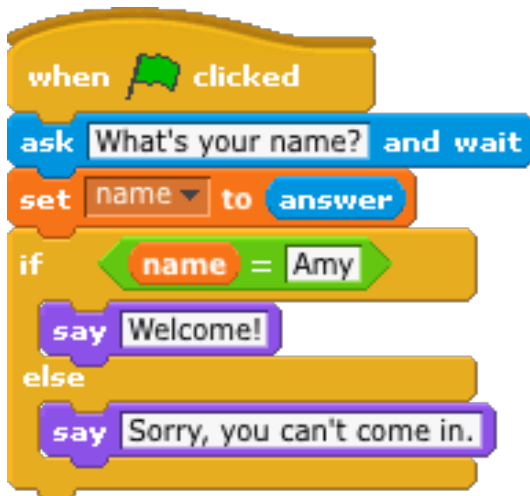
# If statements

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## Python

```
name = raw_input("What's your name?")
if name == "amy":
    print("Welcome!")
else:
    print("Sorry, you can't come in.")
```

## BYOB





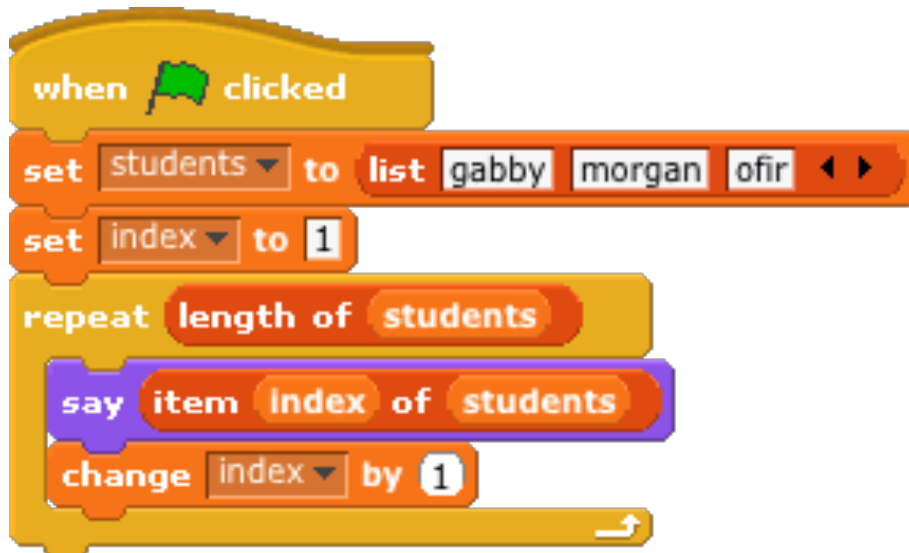
# Loops

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## Python

```
students = ["gabby", "morgan", "ofir"]  
for index in range(len(students)):  
    print(students[index])
```

## BYOB



# Loop shortcut!

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## “For Each” loops

```
students = ["gabby", "morgan", "ofir"]  
for name in students:  
    print(name)
```

# Operators

---

3 + 4

3 + 4

3 - 4

3 - 4

3 \* 4

3 \* 4

12 / 4

12 / 4

pick random 1 to 10

`random.randrange(10)`

\*

ascii code of a

`ord('a')`

ascii 65 as letter

`chr(65)`

\* Must type “import random” first

---

# Operators

---

`3 < 4`

`3 < 4`

`3 == 4`

`3 == 4`

`3 > 4`

`3 > 4`

`3 == 4 and 2 == 2`

`3 == 4 and 2 == 2`

`3 == 4 or 2 == 2`

`3 == 4 or 2 == 2`

`not 3 == 4`

`not (3 == 4)`

`true`

`True`

`false`

`False`

---

# Lists

---

Make a list

```
list = []  
list = ["c", "d", "e"]
```

add f to list

```
list.append("f")
```

insert b at 1 of list

```
list.insert(0, "b")  
list.insert(index, item)
```

delete 1 of list

```
list.pop(1)
```

delete index of "d" in list of list

```
list.remove("d")
```

# Lists and Strings

---

```
word = "bunny"  
list = ["c", "d", "e"]
```

length of 

```
len(list)
```

length of 

```
len(word)
```

item  of 

```
list[1]
```

letter  of 

```
word[1]
```

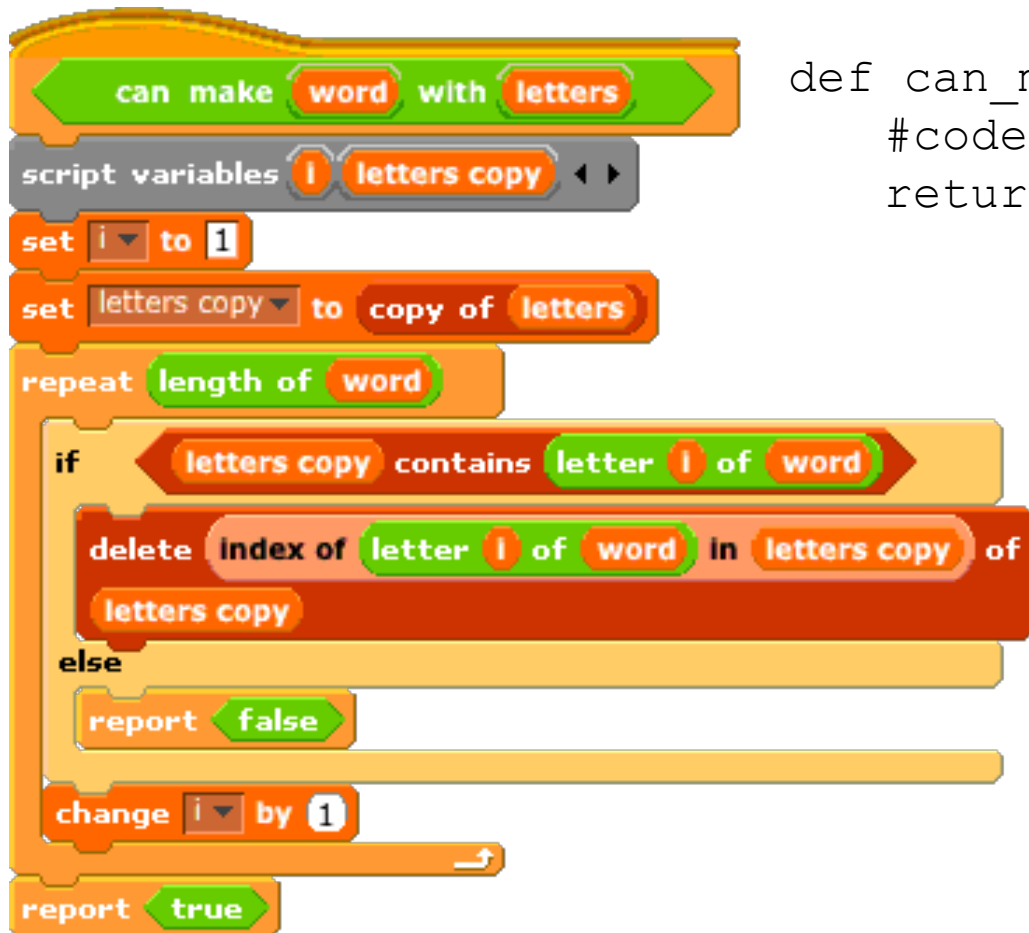
 contains 

```
"d" in list
```

```
"b" in word
```

# Blocks aka Functions

---



```
def can_make_word(word, letters):  
    #code here  
    return True
```

# Blocks aka Functions

---

```
def can_make_word(word, letters):  
    for letter in word:  
        if letter not in available_letters:  
            return False  
        else:  
            available_letters.remove(letter)  
    return True
```

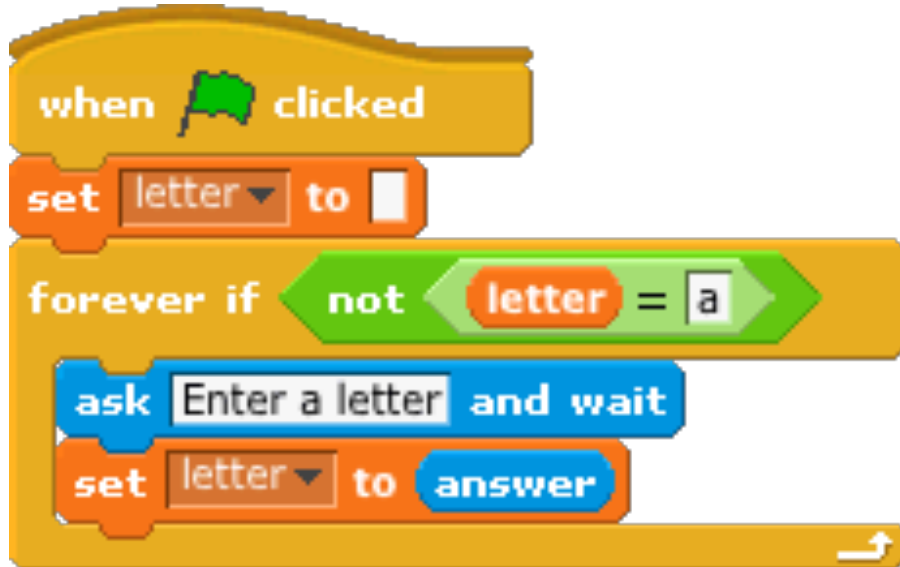
---



# While loops

---

```
letter = ""  
while not letter == "a":  
    letter = raw_input("Enter a letter")
```



# Drawing

---

pen down

clear

set pen color to 

move 10 steps

turn  90 degrees

turn  90 degrees

go to x: 0 y: 0

```
import turtle
t = turtle.Turtle()

t.pendown()

t.clear()

t.color("red")

t.forward(10)

t.left(90)

t.right(90)

t.goto(90, 90)
```

[More at Python Turtle Docs](#)

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# Challenges!

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The following slides have  
challenges to try out in  
Python.

Pick any one you would like!

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# Math with two numbers

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Ask for two numbers, print the sum, difference, and product.

Example output -

```
Enter a number: 4
```

```
Enter a number: 3
```

```
The sum is 7
```

```
The difference is 1
```

```
The product is 12
```

---

# Are you a teacher?

---

Ask for a name, print whether or not the name is a teacher's name.

Hint: You might want to start with a list of the teachers' names

```
teachers = ["erica", "amy", "michael", "brian", "christina"]
```

## Example Output -

```
What is your name? bob
```

```
You are not a teacher.
```

```
What is your name? erica
```

```
You're a teacher!
```

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# Temperature converter

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Write a program that will convert temperatures from Fahrenheit to Celsius. The formula for making the conversion is:

$$\text{celsius} = (5/9) * (\text{fahrenheit} - 32)$$

You should ask the user to input a temperature and then print the conversion.

Example output -

```
Enter a temperature in fahrenheit: 20  
70 F = 21 C
```

# Temperature converter 2.0

---

Create two functions that will convert between Fahrenheit to Celsius and back. The formula for making the conversion from celsius to fahrenheit is:

$$\text{fahrenheit} = (9/5) * \text{celsius} + 32$$

Now have the users enter both the temperature, and the conversion you want to do.

Example output -

```
Enter a temperature: 20
```

```
Convert to (F)ahrenheit or (C)elsius? F
```

```
20 C = 68 F
```

---

# Scrabble Part 1

---

Asks for letters from the user and put them in a list.

Example Output -

```
What letters do you have? bdee  
["b", "d", "e", "e"]
```



# Random list generator

---

First, print 5 random values between 1 and 10.

Example Output -

1  
6  
2  
7  
4

Put those number in a list and print that -

```
[5, 3, 9, 4, 1]
```

Ask how many numbers to output and the range the numbers should be in -

How many numbers? 8

What's the highest random number? 30

```
[16, 11, 28, 14, 14, 12, 6, 23]
```

---

# Guessing game

---

Have the computer pick a random number between 1 and 100. Let the user guess the number and tell them if they're too high or too low.

## Example output -

```
Enter a number between 1 and 100: 62
Too high. Try again: 32
Too low. Try again: 51
Too low. Try again: 56
```

```
Congratulations! You got it.
```

Next, try to output the number of guesses it took -

```
It took you 4 guesses!
```

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# At home

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No python at home is required, but if you want to play with Python at home, we recommend checking out [Codecademy](#) or [Khan Academy](#) which both have online lessons about Python. There's also a [tutorial in the python documentation](#) if you want to dive into the deep end.

To write Python programs of your own, you'll need a plain text editor. [Sublime text](#) is a good one that works on Macs and Windows. Python files end in “.py” so use your editor to create files like “helloworld.py”

On Mac, open the “Terminal” application and type “python helloworld.py” If you type just “python” you'll get a console like we had on the left during class.

On Windows, you'll need to install python first, look for the version 3.3.3 installer for your computer on [the download page](#).

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