

# Welcome to the Labs

Scissors Paper Rock!



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# Who are the tutors?



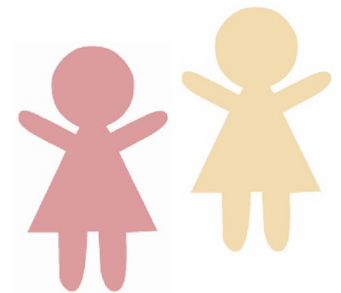
Who are you?



# Ultimate Scissors Paper Rock

1. Start with a partner
2. play scissors paper rock!

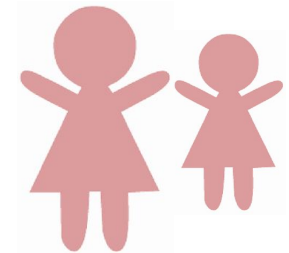
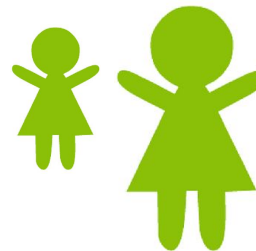
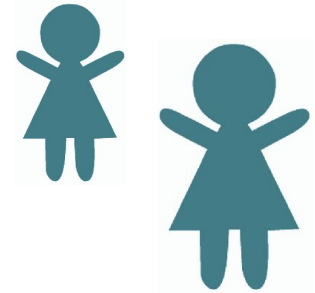
**Who will be the champion?**



# Ultimate Scissors Paper Rock

1. Start with a partner
2. play scissors paper rock!
3. If you win they become your cheer squad!  
And their squad becomes your squad!
4. Find a new partner!
5. Keep playing until there is only one person left!

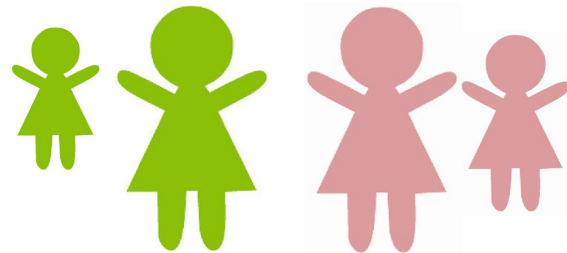
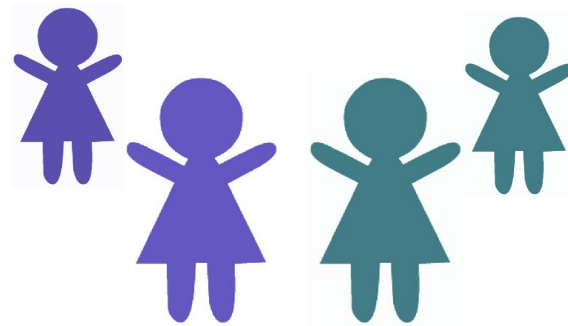
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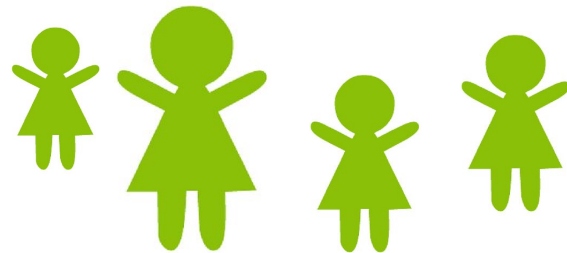
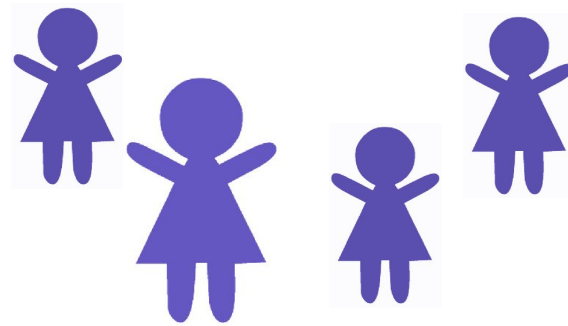
**Who will be the champion?**



# Ultimate Scissors Paper Rock

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**Who will be the champion?**

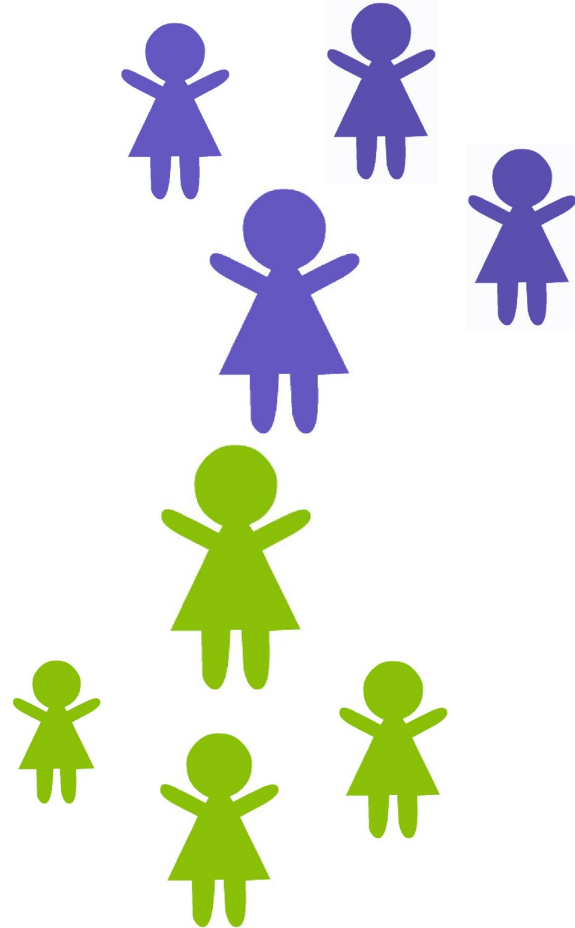




# Ultimate Scissors Paper Rock

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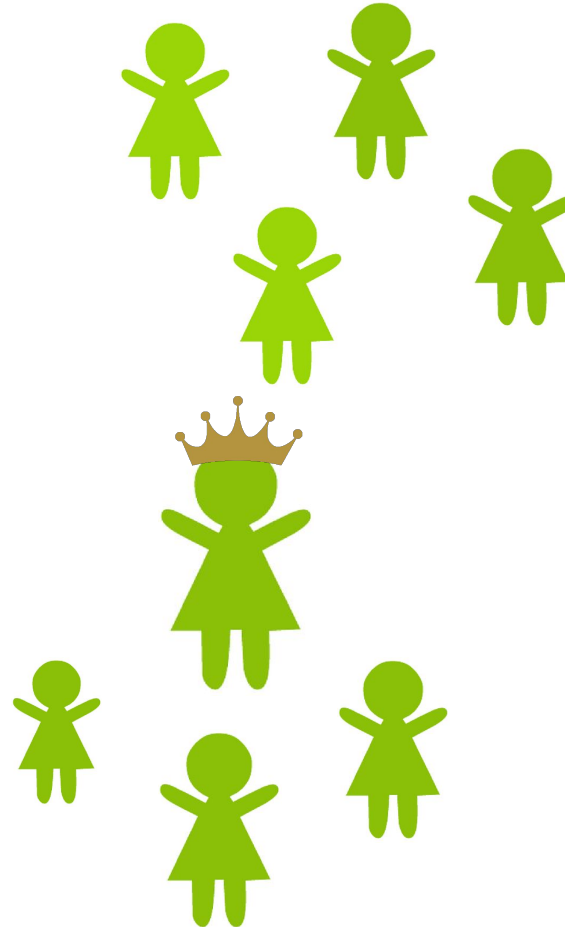
**Who will be the champion?**



# Ultimate Scissors Paper Rock

1. Start with a partner
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And their squad becomes your squad!
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5. Keep playing until there is only one person left!

**Who will be the champion?**



# Log on

## Log on and jump on the GPN website

[girlsprogramming.network/workshop](https://girlsprogramming.network/workshop)

You can see:

- These **slides** (to take a look back or go on ahead).
- A digital copy of your **workbook**.
- Help bits of text you can **copy and paste**!

There's also links to places where you can do more programming!



Tell us you're here!

Click on the  
**Start of Day Survey**  
and fill it in now!



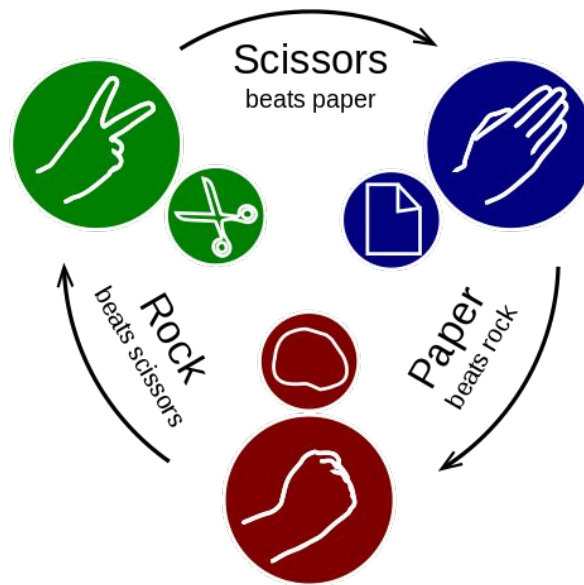
# Today's project!

Scissors Paper Rock!



# Best of Three?

Let's go round the room, and play some Scissors Paper Rock!



It's what we'll be programming today, so have a think about some of the actions required to play!

# Scissors Paper Rock

How did you go? Did you win?

Some of the things that we need to do to play scissors paper rock include:

- We have to select a move (out of scissors, paper and rock)
- Our opponent has to select a move
- We need to know what combinations of move result in win, lose or tie.
- We need to compare our moves to see who won!
- We have to congratulate the winner!

We'll be programming these actions today! Our opponent is going to be the computer.



# Using the workbook!

The workbooks will help you put your project together!

Each **Part** of the workbook is made of tasks!

## Tasks - The parts of your project

Follow the tasks **in order** to make the project!

## Hints - Helpers for your tasks!

Stuck on a task, we might have given you a hint to help you **figure it out**!

The hints have **unrelated** examples, or tips. **Don't copy and paste** in the code, you'll end up with something **CRAZY**!

### Task 6.2: Add a blah to your code!

This has instructions on how to do a part of the project

1. **Start by doing this part**
2. **Then you can do this part**

### Task 6.1: Make the thing do blah!

Make your project do blah ....

#### Hint

A clue, an example or some extra information to help you **figure out** the answer.

```
print('This example is not part of the project' )
```





# Using the workbook!

The workbooks will help you put your project together!

Check off before you move on from a **Part!** Do some bonuses while you wait!

## Checklist - Am I done yet?

Make sure you can tick off every box in this section before you go to the next Part.

## Lecture Markers

This tells you you'll find out how to do things for this section during the names lecture.

## Bonus Activities

Stuck waiting at a lecture marker? Try a purple bonus. They add extra functionality to your project along the way.



## CHECKPOINT



If you can tick all of these off you're ready to move the next part!

- ☐ Your program does blah
- ☐ Your program does blob



## ★ BONUS 4.3: Do some extra!

Something to try if you have spare time before the next lecture!



# Intro to programming



# What is programming?



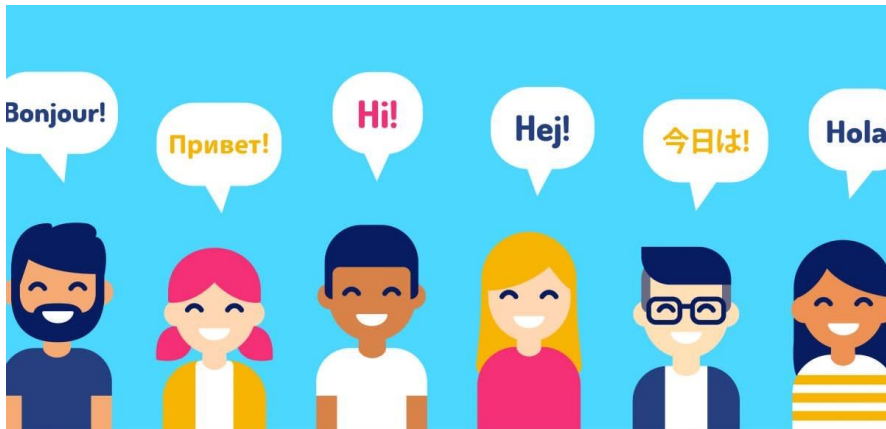
**Programming is not a  
bunch of crazy numbers!**

**It's giving computers  
a set of instructions!**



# A special language

Humans have languages like English, French, Spanish, Mandarin



[https://images.saymedia-content.com/.image/t\\_share/MTc0MTAyNzI3ODUxMjU1MjQx/how-to-easily-learn-a-language.jpg](https://images.saymedia-content.com/.image/t_share/MTc0MTAyNzI3ODUxMjU1MjQx/how-to-easily-learn-a-language.jpg)

And computers have languages like Python, Java, C and PHP



# Problem solving

Programming is how we get computers to solve complicated problems for us, saving us both time and effort!

This might be solving maths problems or counting words in a paragraph!



# People are smart, computers are dumb!

Computers do exactly what they're told. They follow instructions given to them in order, just like a cook following a recipe.



If the instructions are not in the correct order, we will end up with a mess!

# Everyone/thing has strengths!



- Incomplete instructions are okay - we can fill in the blanks!
- Improves everyday



- Incomplete instructions are not okay
- Improves when you tell it how to

# Intro to Python

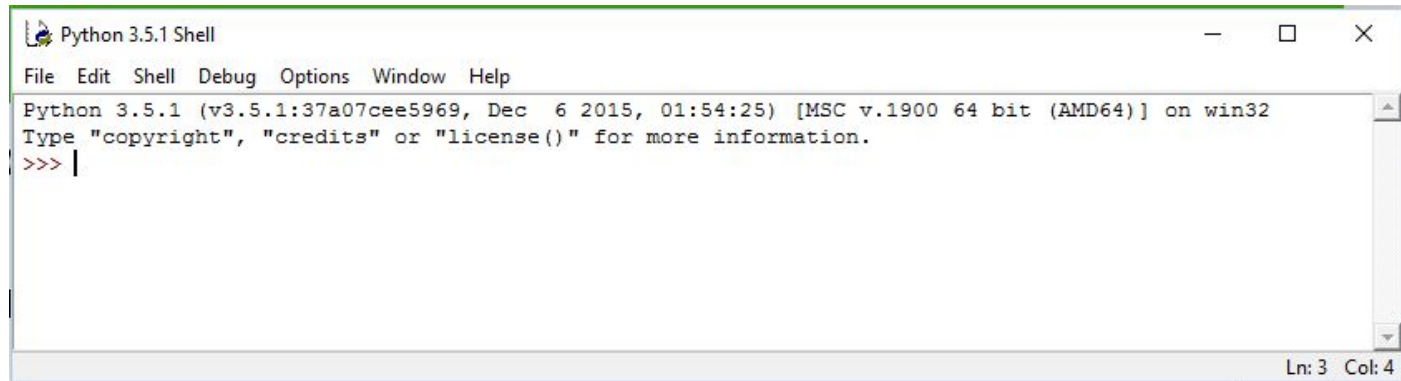
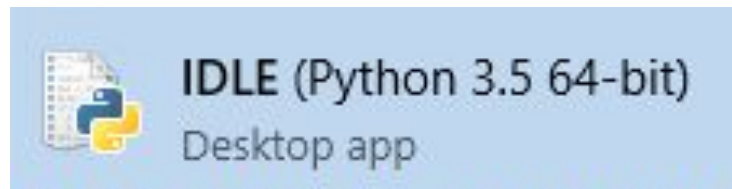
Let's get coding!





# Where do we program? In IDLE

Click the start button and type IDLE!



# Make a mistake!

Type by **button mashing** the keyboard!

Then press enter!

asdf asdjlkj;pa j;k4uroei

**Did you get a big red error message?**



# Mistakes are great!

*SyntaxError:  
Invalid Syntax*

**Good work you made an error!**

*ImportError:  
No module  
named humour*

- Programmers make A LOT of errors!
- Errors give us hints to find mistakes
- Run your code often to get the hints!!
- Mistakes won't break computers!



*AttributeError:  
'NoneType' object  
has no attribute  
'foo'*

*TypeError: Can't  
convert 'int' object  
to str implicitly*

*KeyError:  
'Hairy Potter'*



# Write some code!

Type this into the window  
Then press enter!

```
print('hello world')
```

Did it print:

hello world

???



# Data types

In programming, we have special names for the following:

Number → Integer

Letter → Character

Word → String

Let's look at some examples



# Characters - not always letters

What do all of these have in common?

"A"

'6'

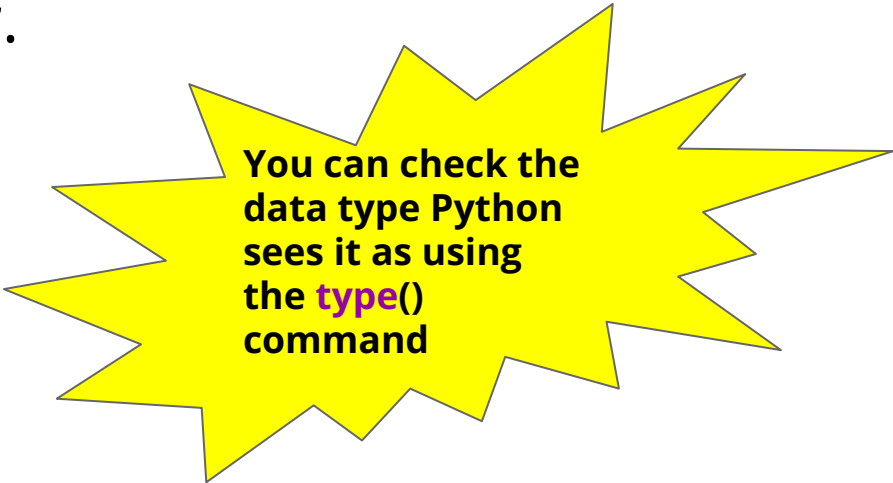
"f"

'\$'

Anything that only takes up only one space and is surrounded by 'single' or "double" quotes, is considered a **character** by the computer.

```
type("5") = char
```

```
type(5) = int
```



You can check the data type Python sees it as using the **type()** command

# Strings

**Strings** are a group of more than one **character** put together and surrounded with "**quotes**"

All of these are strings:

"Dog"

"my name is"

"123 haha"

"\$%^&\*(){}[]"



# A calculator for words!?

What do you think these bits of code do?

**Try them and see!**

```
>>> "cat" + "dog"
```

```
>>> "tortoise" * 3
```





# Calculator for... words!?

What do you think these bits of code do?

**Try them and see!**

```
>>> "cat" + "dog"
```

```
catdog
```

```
>>> "tortoise" * 3
```



# Calculator for... words!?

What do you think these bits of code do?

**Try them and see!**

```
>>> "cat" + "dog"
```

```
catdog
```

```
>>> "tortoise" * 3
```

```
tortoisetortoisetortoise
```



# Calculator for words and number?

If we can do calculations with numbers, and calculations with words, can we do calculations with words *and* numbers?

Try writing this!

```
>>> 1 + "1"
```

```
>>> "100" * 2
```

How do we deal with this problem? See next slide!



# Type casting

We tell the computer exactly what type we want to use!

We can turn a `string` into an `integer` using `int()`

```
>>> 5 + int("5")
```

Similarly, we turn an `integer` into a `string` using `str()`

```
>>> str(5) + "5"
```



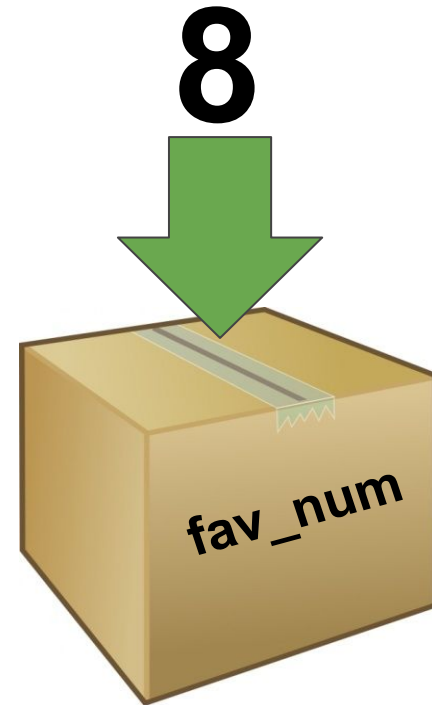
# No Storing is Boring!

**It's useful to be able to remember things for later!**

Computers remember things in "**variables**"

Variables are like putting things into a **labeled cardboard box**.

**Let's make our favourite number 8 today!**



# Variables

Instead of writing the number 8, we can write fav\_num.



$$\text{fav\_num} - 6 \\ \Rightarrow \mathbf{2}$$

$$\text{fav\_num} + 21 \\ \Rightarrow \mathbf{29}$$

$$\text{fav\_num} * 2 \\ \Rightarrow \mathbf{16}$$

$$\text{fav\_num} / 2 \\ \Rightarrow \mathbf{4}$$



# Variables

Instead of writing the number 8, we can write fav\_num.



fav\_num - 6  
**=> 2**

fav\_num + 21  
**=> 29**

fav\_num \* 2  
**=> 16**

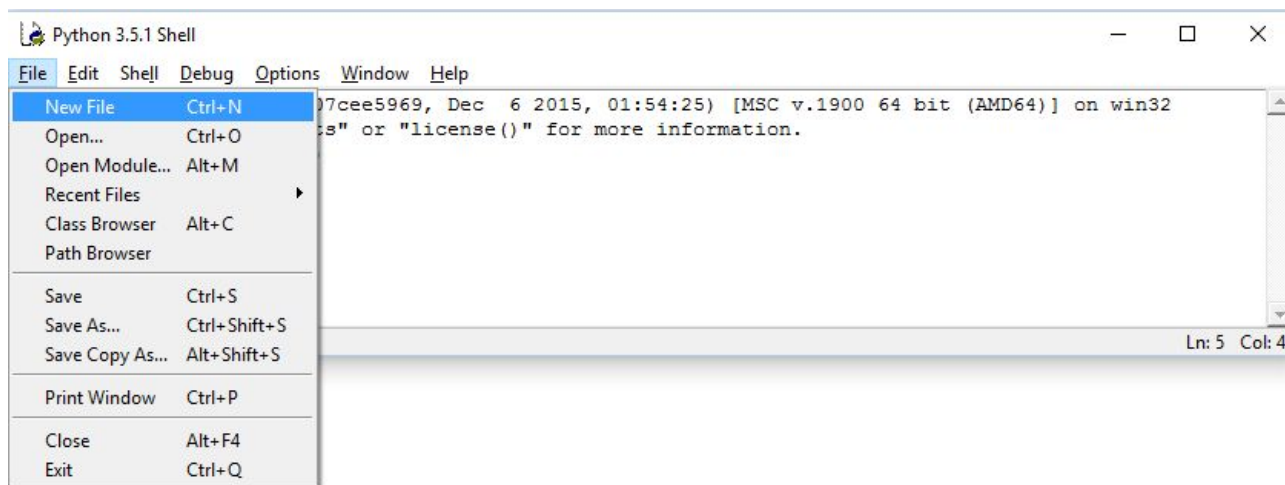
But writing 8 is  
much shorter than  
writing fav\_num???



**We'll come back to this later!**

# Coding in a file!

Code in a file is code we can run multiple times! Make a reusable “hello world”!



1. Make a new file called hello.py, like the picture
2. Put your `print('hello world')` code in it
3. Run your file using the F5 key



# Adding a comment!

Sometimes we want to write things in our file that the computer doesn't look at. We can use **comments** for that!

Sometimes we want to write a note for a people to read

```
# This code was written by Vivian
```

And sometimes we want to not run some code (but don't want to delete it!)

```
# print("Goodbye world!")
```

## Try it!

1. Add a comment to your hello.py file
2. Run your code to make sure it doesn't do anything extra!



# Asking a question!

It's more fun when we get to interact with the computer!

**Try out this code to get the computer to ask you a question!**

```
my_name = input('What is your name? ')\nprint('Hello ' + my_name)
```

What do you think happens?



# Asking a question!

```
my_name = input('What is your name? ')\nprint('Hello ' + my_name)
```

What do you think happens?

What is your name? Maddie

Hello Maddie



# Asking a question!

Store the answer  
in the variable  
my\_name

Writing input tells  
the computer to  
wait for a response

This is the question  
you want printed to  
the screen

```
my_name = input('What is your name? ')\nprint('Hello ' + my_name)
```

What do you think happens?

What is your name? Maddie

Hello Maddie

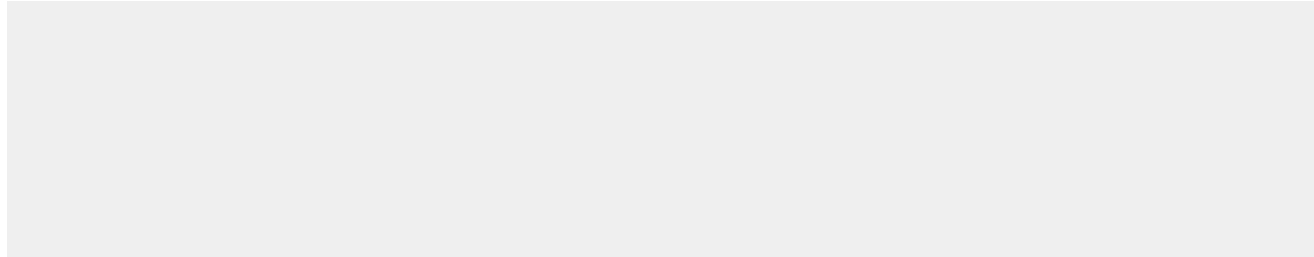
We can use the answer  
the user wrote that we  
then stored later!



# Asking a question!

How would we ask somebody for their favourite type of cake?

How would we print their answer?



```
What cake do you like? chocolate  
chocolate cake for you!
```



# Asking a question!

How would we ask somebody for their favourite type of cake?

How would we print their answer?

```
flavour = input("What cake do you like? ")
```

```
What cake do you like? chocolate  
chocolate cake for you!
```



# Asking a question!

How would we ask somebody for their favourite type of cake?

How would we print their answer?

```
flavour = input("What cake do you like? ")  
print(flavour + "cake for you!")
```

```
What cake do you like? chocolate  
chocolate cake for you!
```



# Project time!

You now know all about printing and variables!

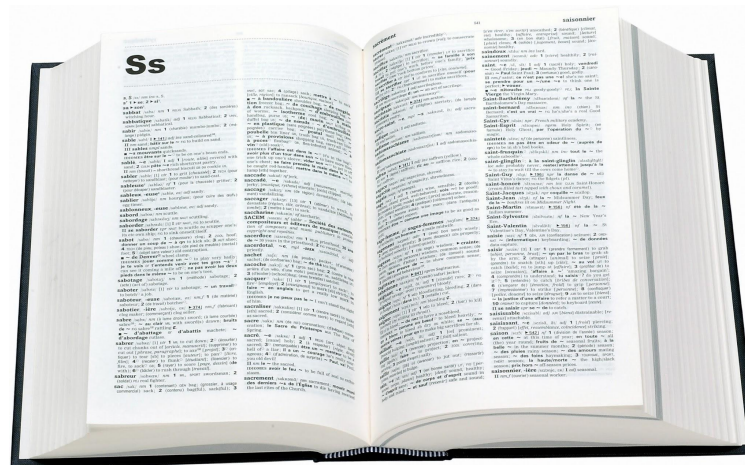
**Let's put what we learnt into our project**  
**Try to do Part 0 - Part 2**

The tutors will be around to help!

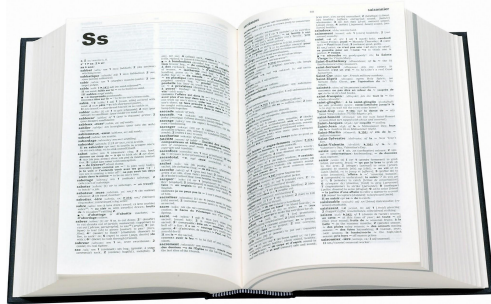




# Dictionaries



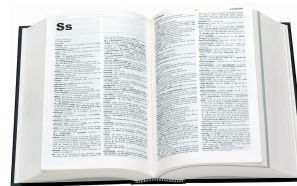
# Dictionaries!



***You know dictionaries!***

**They're great at looking up thing  
by a word, not a position in a list!**

Look up  
***Hello***



**Get back**

***A greeting (salutation) said  
when meeting someone or  
acknowledging someone's  
arrival or presence.***



# Looking it up!

**There are lots of times we want to look something up!**



**Competition registration**

Team Name → List of team members



**Phone Book**

Name → Phone number



**Vending Machine**

Treat Name → Price



Looking it up!



## Phone Book

Name → Phone number

↑  
Key

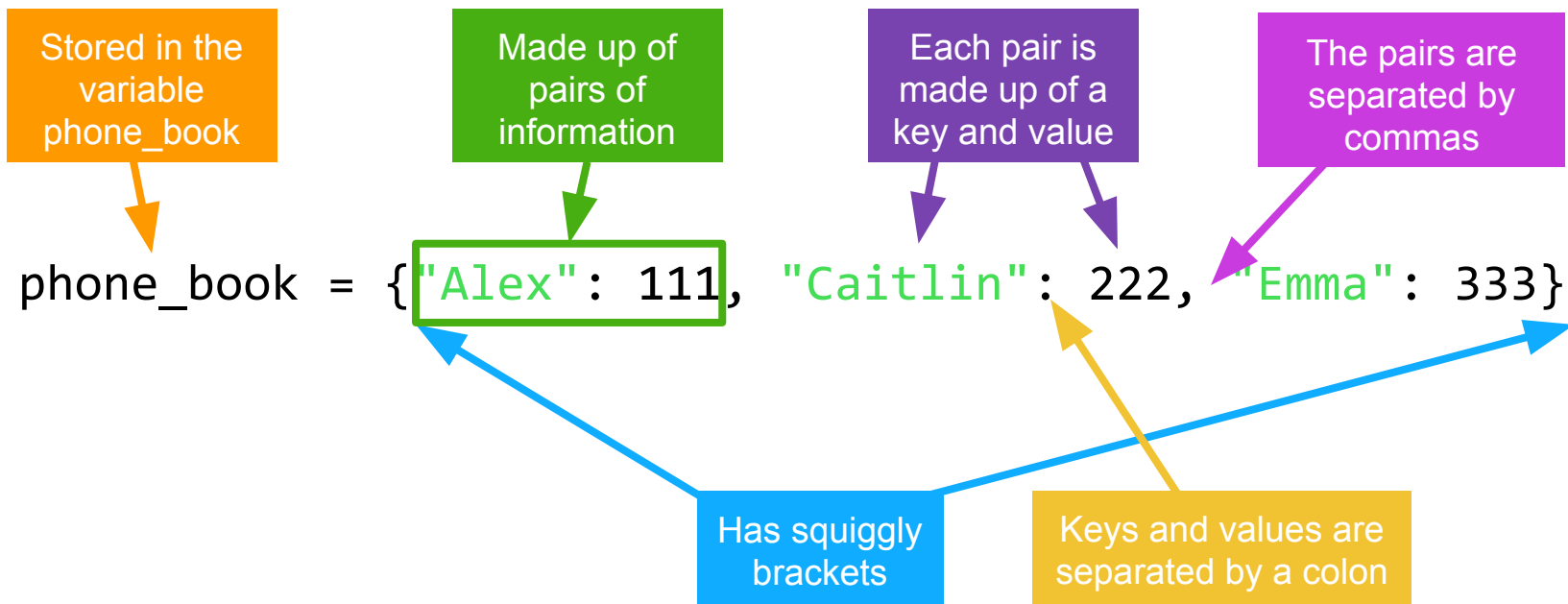
↑  
Value

**We can use a dictionary for anything with a  
key → value pattern!**



# Dictionaries anatomy!

**This is a python dictionary!**



**This dictionary has Alex, Caitlin and Emma's phone numbers**



# Playing with dictionaries!

Let's look at an example!

```
phone_book = {"Alex": 111, "Caitlin": 222, "Emma": 333}
```

1. What happens?

```
phone_book["Alex"]
```

2. How would you look up Emma's phone number?

3. Look up the name of someone who is not in the phone book? What happens?



# Playing with dictionaries!

Let's look at an example!

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phone_book = {"Alex": 111, "Caitlin": 222, "Emma": 333}
```

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111

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phone_book["Emma"]
```

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# Playing with dictionaries!

Let's look at an example!

```
phone_book = {"Alex": 111, "Caitlin": 222, "Emma": 333}
```

1. What happens?

```
phone_book["Alex"]
```

111

2. How would you look up Emma's phone number?

```
phone_book["Emma"]
```

3. Look up the name of someone who is not in the phone book? What happens?

**KeyError**



# Tuples!

## Some data sticks together!

Tuples are like lists that you can't edit or add too!

**It's a:**

- **list of items**
- **in round brackets**
- **separated by commas**

**Tuples are a way of grouping data!**

("January", "1st")

("December", "25th")

("April", "25th")



# Tuples in dictionaries!

## We can use tuples as the key to a dictionary

```
holidays = {("January", "1st"): "New Years",  
             ("December", "25th"): "Christmas Day",  
             ("April", "25th"): "ANZAC Day"}
```

1. What about this: `holidays[("January", "1st")]`
2. How would you look up what happens on the 25th of April
3. What happens if you we do: `phone_book[("25th", "December")]`



# Tuples in dictionaries!

## We can use tuples as the key to a dictionary

```
holidays = {("January", "1st"): "New Years",  
             ("December", "25th"): "Christmas Day",  
             ("April", "25th"): "ANZAC Day"}
```

1. What about this: `holidays[("January", "1st")]`  
New Years
2. How would you look up what happens on the 25th of April
3. What happens if you we do: `phone_book[("25th", "December")]`



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```

1. What about this: `holidays[("January", "1st")]`  
New Years

2. How would you look up what happens on the 25th of April

```
holidays[("April", "25th")]
```

3. What happens if you we do: `phone_book[("25th", "December")]`



# Tuples in dictionaries!

## We can use tuples as the key to a dictionary

```
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             ("April", "25th"): "ANZAC Day"}
```

1. What about this: `holidays[("January", "1st")]`  
**New Years**

2. How would you look up what happens on the 25th of April

```
holidays[("April", "25th")]
```

3. What happens if you we do: `phone_book[("25th", "December")]`  
**KeyError**

# Project time!

You now know all about dictionaries!

**Let's put what we learnt into our project**  
**Try to do Part 3**

The tutors will be around to help!



# If Statements





# Conditions!

**Conditions let us make decision.**  
**First we test if the condition is met!**  
**Then maybe we'll do the thing**



**If it's raining** take an umbrella

**Yep it's raining**

**..... take an umbrella**

# Booleans (True and False)

computers store whether a condition is met in the form of

**True** and **False**

To figure out if something is **True** or **False** we do a comparison

`5 < 10`

`3 + 2 == 5`

`5 != 5`

`"Dog" == "dog"`

`"D" in "Dog"`

`"Q" not in "Cat"`



# Booleans (True and False)

computers store whether a condition is met in the form of

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To figure out if something is **True** or **False** we do a comparison

<code>5 &lt; 10</code>	<code>True</code>	<code>"Dog" == "dog"</code>
<code>3 + 2 == 5</code>		<code>"D" in "Dog"</code>
<code>5 != 5</code>		<code>"Q" not in "Cat"</code>



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`5 < 10`      **True**

`3 + 2 == 5`      **True**

`5 != 5`

`"Dog" == "dog"`

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<code>3 + 2 == 5</code>	<code>True</code>	<code>"D" in "Dog"</code>	
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computers store whether a condition is met in the form of

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To figure out if something is **True** or **False** we do a comparison

5 < 10	True	"Dog" == "dog"	False
3 + 2 == 5	True	"D" in "Dog"	True
5 != 5	False	"Q" not in "Cat"	



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computers store whether a condition is met in the form of

**True** and **False**

To figure out if something is **True** or **False** we do a comparison

5 < 10	True	"Dog" == "dog"	False
3 + 2 == 5	True	"D" in "Dog"	True
5 != 5	False	"Q" not in "Cat"	True





# Booleans (True and False)

Python has some special comparisons for checking if something is **in** something else. **Try these!**

```
>>> "A" in "AEIOU"  
>>> "Z" in "AEIOU"  
>>> "a" in "AEIOU"
```

```
>>> animals = ["cat", "dog", "goat"]  
>>> "banana" in animals  
>>> "cat" in animals
```



# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5
if fave_num < 10:
    print("that's a small number")
```

# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5  
if fave_num < 10:  
    print("that's a small number")
```

That's the  
condition!

# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5
if fave_num < 10:
    print("that's a small number")
```

That's the  
condition!

Is it **True** that fave\_num is less than 10?

- Well, fave\_num is 5
- And it's **True** that 5 is less than 10
- So it is **True**!



# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5  
if True:  
    print("that's a small number")
```

Put in the  
answer to  
the question

Is it **True** that fave\_num is less than 10?

- Well, fave\_num is 5
- And it's **True** that 5 is less than 10
- So it is **True**!



# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5
if True:
    print("that's a small number")
```

What do you think happens?

```
>>>
```



# Conditions

So to know whether to do something, they find out if it's **True**!

```
fave_num = 5
if True:
    print("that's a small number")
```

What do you think happens?

```
>>> that's a small number
```



# Conditions

How about a different number???



```
fave_num = 9000  
if fave_num < 10:  
    print("that's a small number")
```



# Conditions

Find out if it's **True**!

```
fave_num = 9000  
if False:  
    print("that's a small number")
```

Put in the  
answer to  
the question

Is it **True** that fave\_num is less than 10?

- Well, fave\_num is 9000
- And it's not **True** that 9000 is less than 10
- So it is **False**!



# Conditions

How about a different number???

```
fave_num = 9000  
if fave_num < 10:  
    print("that's a small number")
```



What do you think happens?

```
>>>
```

# Conditions

How about a different number???

```
fave_num = 9000  
if fave_num < 10:  
    print("that's a small number")
```



What do you think happens?

```
>>>
```



**Nothing!**



# If statements

```
fave_num = 5  
if fave_num < 10:  
    print("that's a small number")
```

This line ...

... controls this line



# If statements

## Actually .....

```
fave_num = 5
if fave_num < 10:
    print("that's a small number")
    print("and I like that")
    print("A LOT!!")
```

This line ...

... controls anything below it  
that is indented like this!



# If statements

```
fave_num = 5
if fave_num < 10:
    print("that's a small number")
    print("and I like that")
    print("A LOT!!")
```

What do you think happens?

```
>>>
```



# If statements

```
fave_num = 5
if fave_num < 10:
    print("that's a small number")
    print("and I like that")
    print("A LOT!!")
```

```
>>> that's a small number
>>> and I like that
>>> A LOT!!
```



# If statements

```
word = "GPN"  
if word == "GPN":  
    print("GPN is awesome!")
```

What happens??



# If statements

```
word = "GPN"  
if word == "GPN":  
    print("GPN is awesome!")
```

What happens??

```
>>> GPN is awesome!
```



# Else statements

```
word = "GPN"  
if word == "GPN":  
    print("GPN is awesome!")
```

What happens??

```
>>> GPN is awesome
```

**But what if we want  
something different  
to happen if the  
word isn't "GPN"**

# Else statements

```
word = "Chocolate"  
if word == "GPN":  
    print("GPN is awesome!")  
else:  
    print("The word isn't GPN :(")
```

**else**  
statements  
means something  
still happens if  
the **if** statement  
was **False**

What happens??



# Else statements

```
word = "Chocolate"
if word == "GPN":
    print("GPN is awesome!")
else:
    print("The word isn't GPN :(")
```

**else**  
statements  
means something  
still happens if  
the **if** statement  
was **False**

What happens??

```
>>> The word isn't GPN :(
```



# Elif statements

```
word = "Chocolate"
if word == "GPN":
    print("GPN is awesome!")
elif word == "Chocolate":
    print("YUMMM Chocolate!")
else:
    print("The word isn't GPN :(")
```

**elif**

Means we can  
give specific  
instructions for  
other words

What happens??



# Elif statements

```
word = "Chocolate"
if word == "GPN":
    print("GPN is awesome!")
elif word == "Chocolate":
    print("YUMMM Chocolate!")
else:
    print("The word isn't GPN :(")
```

**elif**

Means we can  
give specific  
instructions for  
other words

What happens??  
>>>YUMMM Chocolate!



# Project Time!

You now know all about **if** and **else**!

**See **if** you can do Part 4**

The tutors will be around to help!



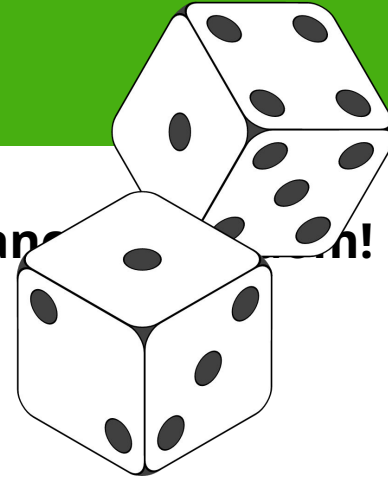
Random!





# That's so random!

There's lots of things in life that are up to chance!



We want the computer to be random sometimes!



Python lets us **import** common bits of code people use! We're going to use the **random** module!



# Using the random module

Let's choose something randomly from a list!

This is like drawing something out of a hat in a raffle!

**Here's an example!**

**1. Import the random module!**

```
>>> import random
```

**2. Copy the shopping list into IDLE**

```
>>> shopping_list = ["eggs", "bread", "apples", "milk"]
```

**3. Choose randomly! Try it a few times!**

```
>>> random.choice(shopping_list)
```



# Using the random module

## You can also assign your random choice to a variable

```
>>> import random
>>> shopping_list = ["eggs", "bread", "apples", "milk"]
>>> random_food = random.choice(shopping_list)
>>> print(random_food)
```



# Project Time!

**Raaaaaaaaaandom! Can you handle that?**

**Let's put what we learnt into our project**

**Try to do Part 4**

The tutors will be around to help!



# For Loops



# Looping through lists!

What would we do if we wanted to print out this list, one word at a time?

```
words = ['This', 'is', 'a', 'sentence']
```

```
print(words[0])
```

```
print(words[1])
```

```
print(words[2])
```

```
print(words[3])
```

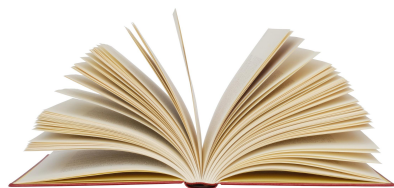
**What if it had a 100 items??? That would be BORING!**



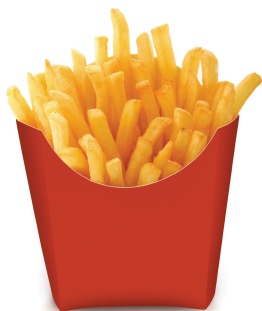
# For Loops

For loops allow you to do something for **each** item in a **group** of things

There are many real world examples, like:



**For each page in this book:  
Read**



**For each chip in this bag of chips:  
Eat**



# Looping over a list of ints

## We can loop through a list:

```
fruits = ['apple', 'banana', 'mango']  
for fruit in fruits:  
    print('yummy ' + fruit)
```

What's going to happen?





# Looping over a list of ints

## We can loop through a list:

```
fruits = ['apple', 'banana', 'mango']  
for fruit in fruits:  
    print('yummy ' + fruit)
```

What's going to happen?

```
>>>Yummy apple  
>>>Yummy banana  
>>>Yummy mango
```

- Each item of the list takes a turn at being the variable fruit
- Do the body once for each item
- We're done when we run out of items!




# How does it work??

**Somehow it knows how to get one fruit out at a time!!**


It's like it knows english!

```
fruits = ['apple', 'banana', 'mango']  
for fruit in fruits:  
    print('yummy ' + fruit)
```



**But fruit is just a variable!** We could call it anything! Like dog!

```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
    print('yummy ' + dog)
```



```
>>>Yummy apple  
>>>Yummy banana  
>>>Yummy mango
```




# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']
```




```
for dog in fruits:  
    print('yummy ' + dog)
```

Let's set dog to to the **first**  
thing in the list!  
dog is now 'apple'!



# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']  
▶ for dog in fruits:  
    print('yummy ' + dog)
```

Let's set dog to to the **first** thing in the list!

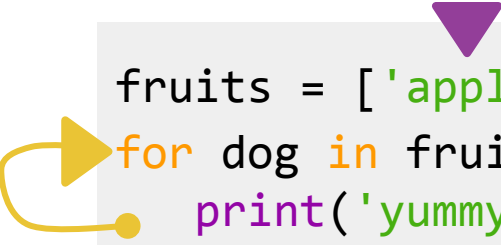
dog is now 'apple'!  
print('yummy ' + dog)

>>>Yummy apple



# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
    print('yummy ' + dog)
```

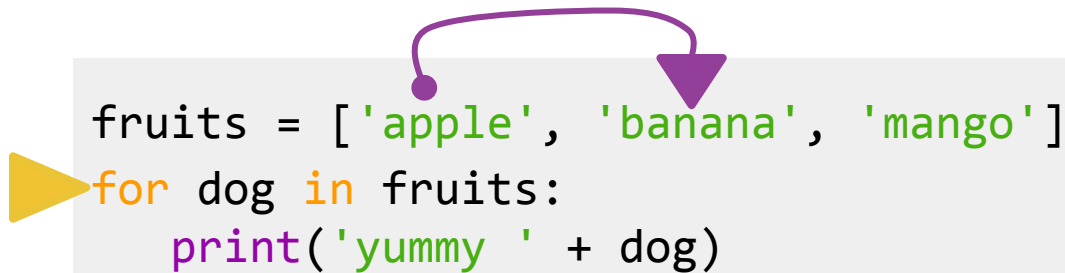
```
>>>Yummy apple
```

Let's set dog to to the **first** thing in the list!  
dog is now 'apple'!  
`print('yummy ' + dog)`  
***We're at the end of the loop body, back to the top!***



# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']  
▶ for dog in fruits:  
    print('yummy ' + dog)
```

```
>>>Yummy apple
```


Let's set dog to to the **first** thing in the list!  
dog is now 'apple'!  
print('yummy ' + dog)  
*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'banana'!



# How does it work??

Everything in the list gets to have a turn at being the dog variable




```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
▶ print('yummy ' + dog)
```

```
>>>Yummy apple  
>>>Yummy banana
```

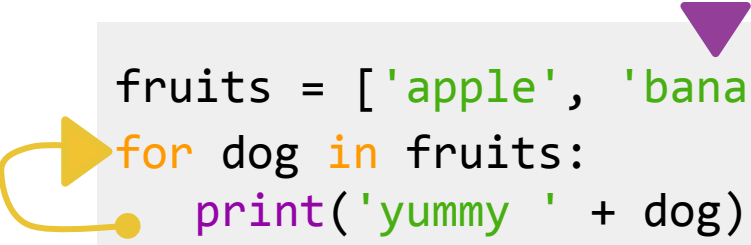
Let's set dog to to the **first** thing in the list!  
dog is now 'apple'!  
print('yummy ' + dog)  
*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'banana'!  
print('yummy ' + dog)



# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
    print('yummy ' + dog)
```

```
>>>Yummy apple
```

```
>>>Yummy banana
```

Let's set dog to to the **first** thing in the list!

dog is now 'apple'!

```
print('yummy ' + dog)
```

*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!

dog is now 'banana'!

```
print('yummy ' + dog)
```

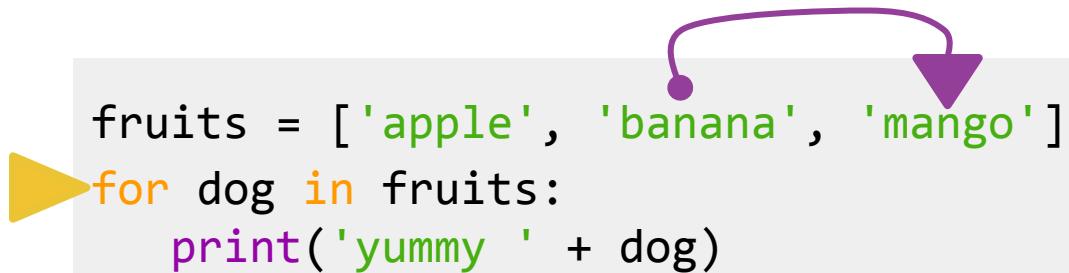
*Out of body, back to the top!*





# How does it work??

Everything in the list gets to have a turn at being the dog variable



```
fruits = ['apple', 'banana', 'mango']  
▶ for dog in fruits:  
    print('yummy ' + dog)
```

```
>>>Yummy apple
```

```
>>>Yummy banana
```

Let's set dog to to the **first** thing in the list!

dog is now 'apple'!

```
print('yummy ' + dog)
```

*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!

dog is now 'banana'!

```
print('yummy ' + dog)
```

*Out of body, back to the top!*

Let's set dog to to the **next** thing in the list!

dog is now 'mango'!



# How does it work??

Everything in the list gets to have a turn at being the dog variable

```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
    print('yummy ' + dog)
```

```
>>>Yummy apple  
>>>Yummy banana  
>>>Yummy mango
```

Let's set dog to to the **first** thing in the list!  
dog is now 'apple'!  
print('yummy ' + dog)  
*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'banana'!  
print('yummy ' + dog)  
*Out of body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'mango'!  
print('yummy ' + dog)



# How does it work??

Everything in the list gets to have a turn at being the dog variable

```
fruits = ['apple', 'banana', 'mango']  
for dog in fruits:  
    print('yummy ' + dog)
```

```
>>>Yummy apple  
>>>Yummy banana  
>>>Yummy mango
```



Let's set dog to to the **first** thing in the list!  
dog is now 'apple'!  
print('yummy ' + dog)  
*We're at the end of the loop body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'banana'!  
print('yummy ' + dog)  
*Out of body, back to the top!*

Let's set dog to to the **next** thing in the list!  
dog is now 'mango'!  
print('yummy ' + dog)  
*Out of body, and out of list!! We're done here!*



# Generating a List!

**Sometimes you don't care about what is in the list!**

You just want to repeat 10 times or a 1000 times!

**Doing this is boring.....**

```
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

**But python will make a list of things for you!**

**Try this!**

```
for num in range(50):  
    print(num)
```



# Project Time!

**Now you know how to use a for loop!**

**Try to do Part 6**

**...if you are up **for** it!**

And Extension parts 7-10

The tutors will be around to help!



# More Dictionaries and Lists!

**Before we start this lecture  
Trying doing Part 0, 1, 2 in your second workbook!**



# Make your own dictionary!

**Before we started with a dictionary with stuff in it!**  
**Let's start from empty!**

1. We can make an empty dictionary like this!  
`phone_book = {}`
2. Let's fill up the phone book!  
Use this code to set a phone number for Janette!  
`phone_book["Janette"] = 999`



# Make your own dictionary!

**But how do we add tuples to our dictionary as keys?**

1. Let's make an empty dictionary!

```
event_diary = {}
```

2. Let's fill up the diary!

Use this code to set a date for a party!

```
event_diary[("March", "21")] = "Elise's Party"
```





# Project Time!

**Now you know even more about  
Dictionaries and Lists!**

In your second workbook,

**Try Extension Part 11**

The tutors will be around to help!



Tell us what you think!

Click on the  
**End of Day Form**  
and fill it in now!