Guess Who!

Welcome to the Labs

Welcome to the Labs

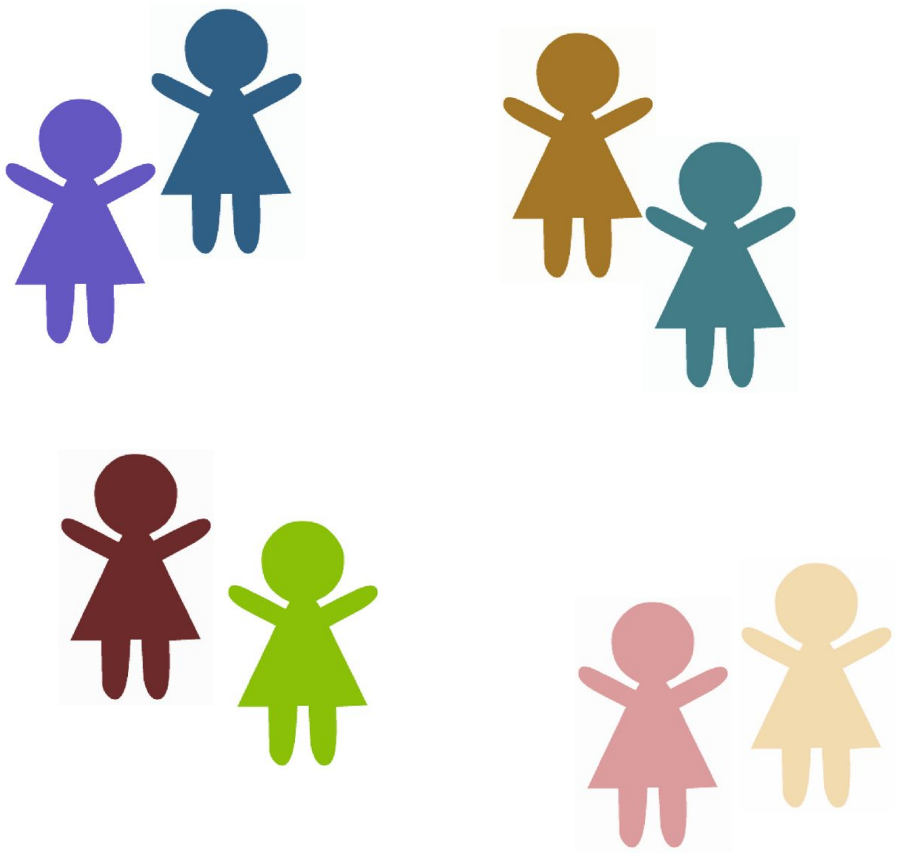
Guess Who!

Who are the tutors?

Who are you?

Introduce your partner

1. Find a partner (someone you've never met before)
2. Find out:
   a. Their name
   b. What (school) year they are in
   c. A fun fact about them!
3. Introduce them to the rest of the group!



Log on

Jump on the GPN website

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!

Guess Who?

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** ☑

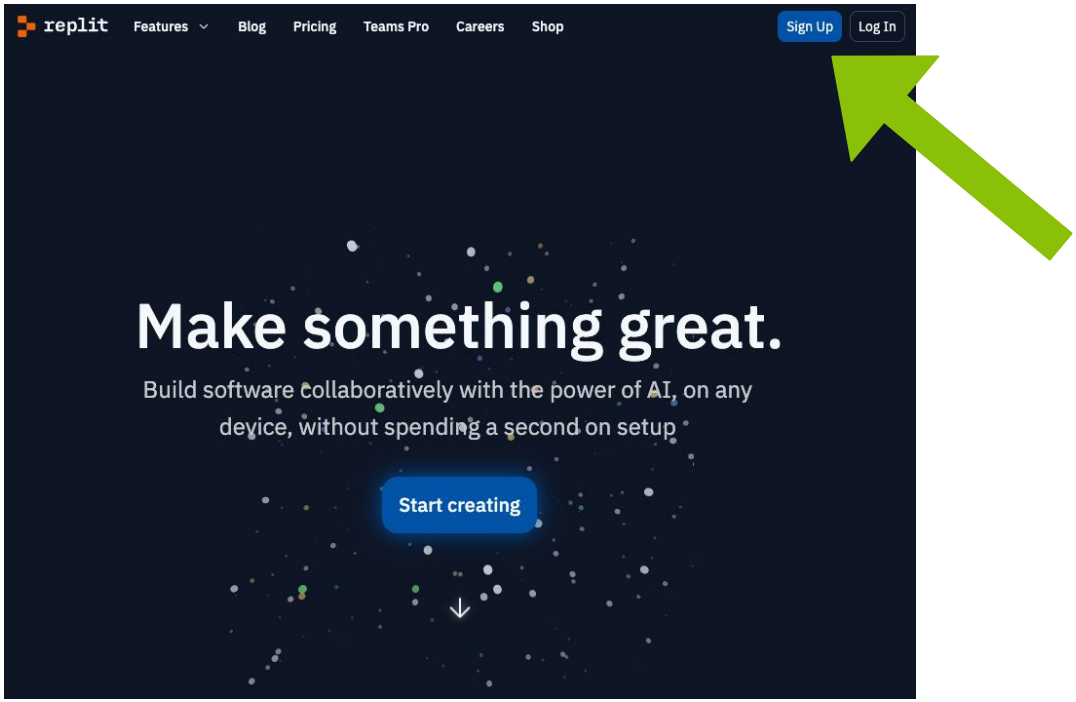
If you can tick all of these off you're ready to move the next part!
☐ Your program does blah
☐ Your program does blob

★ **BONUS 4.3: Do some extra!**

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

Where do we program?

We'll use ***Repl It*** to make a Python project!



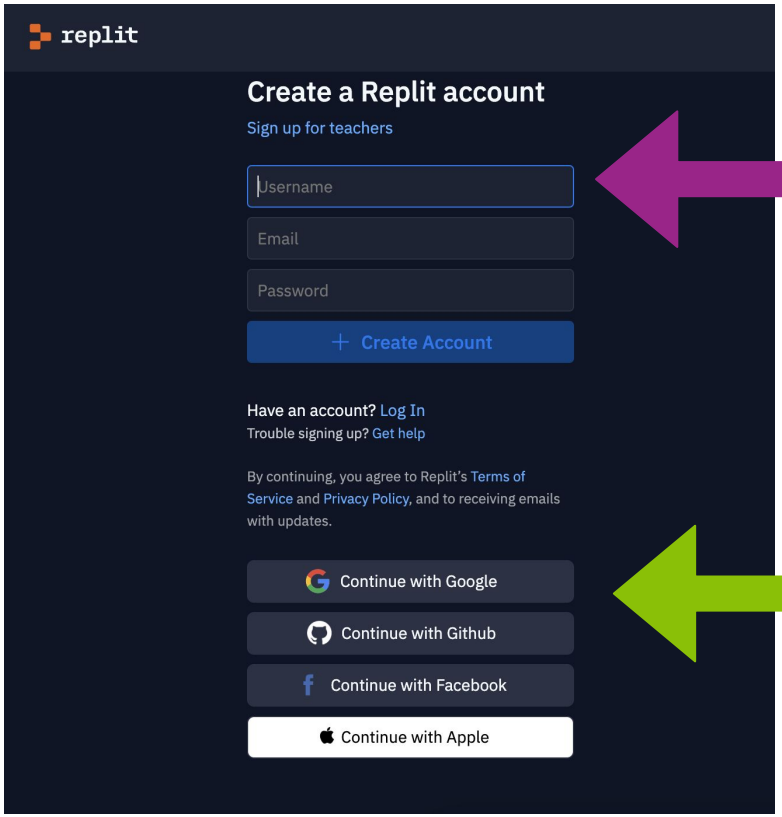
Go to replit.com in Google Chrome

Where do we program?

You need to sign up or sign in to start coding

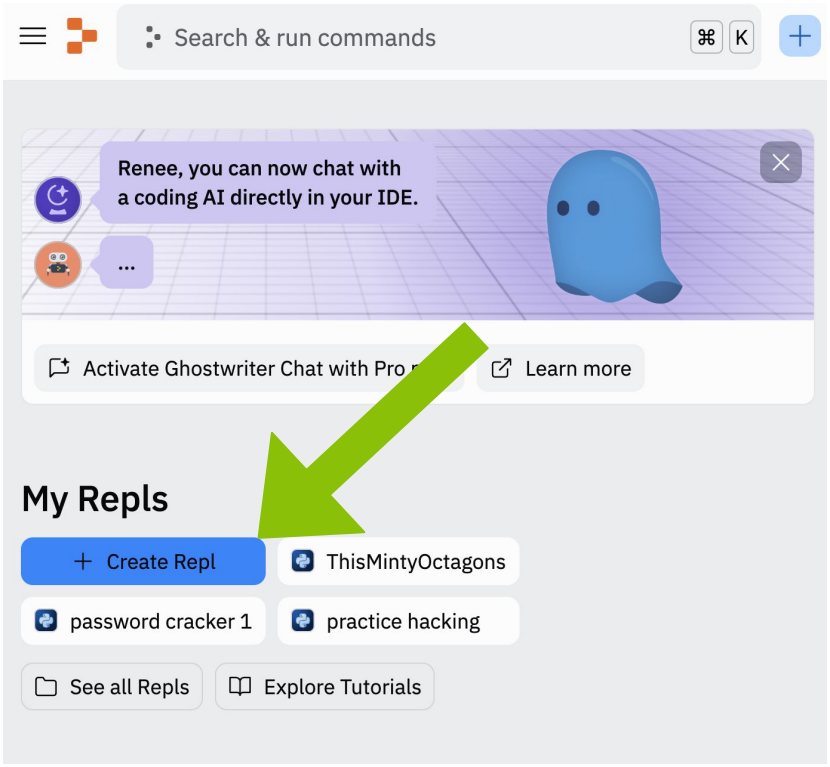
If you have a **Google** or **Apple account** it's easiest to use that.

Or use an **email address** you are able to log into.

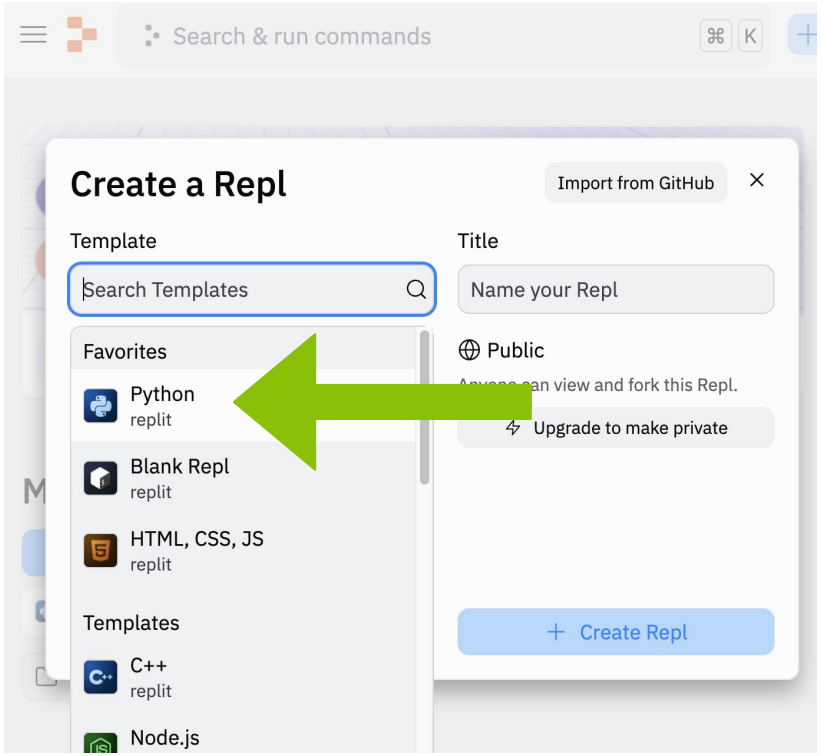


Creating our **Repl It Project**

Let's create a new project



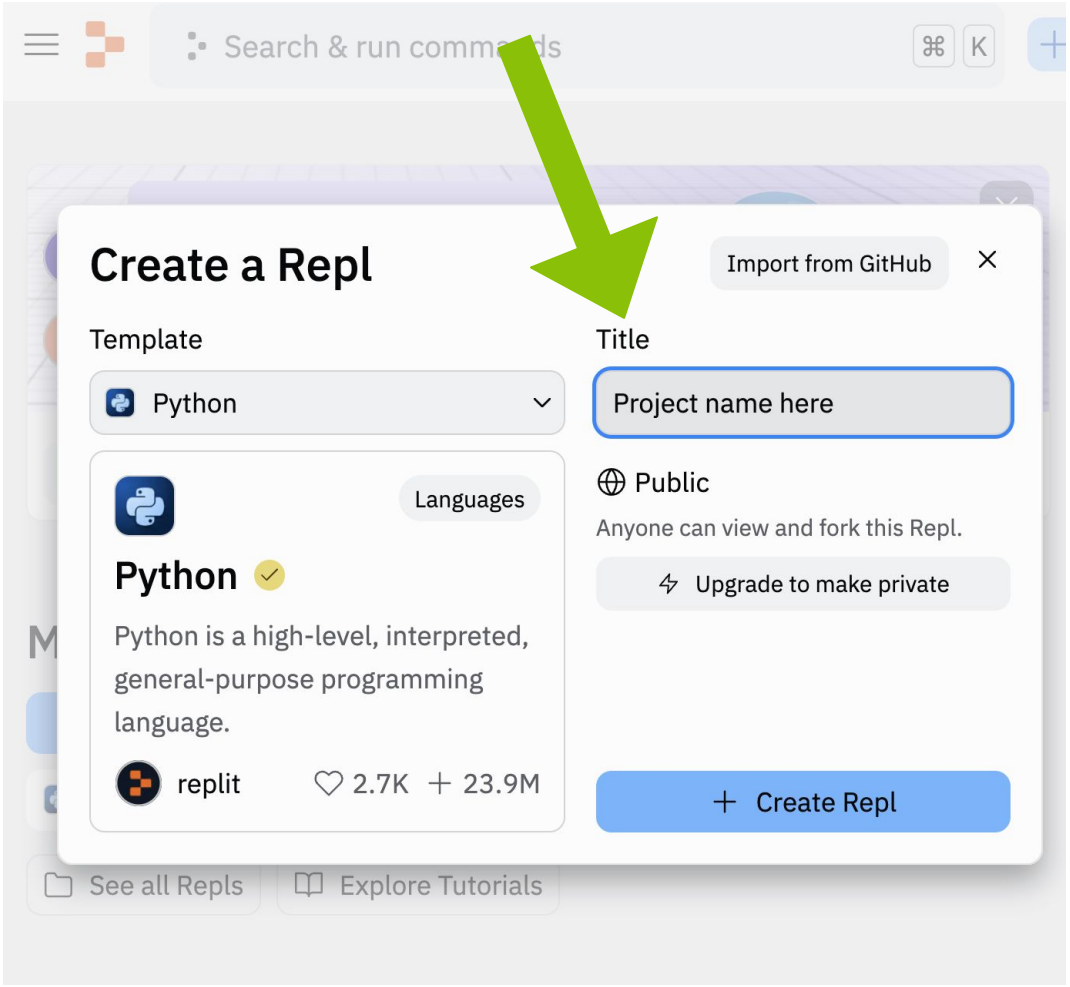
Select Python for the project template



Creating our **Repl It Project**

Don’t forget to give your project a name!

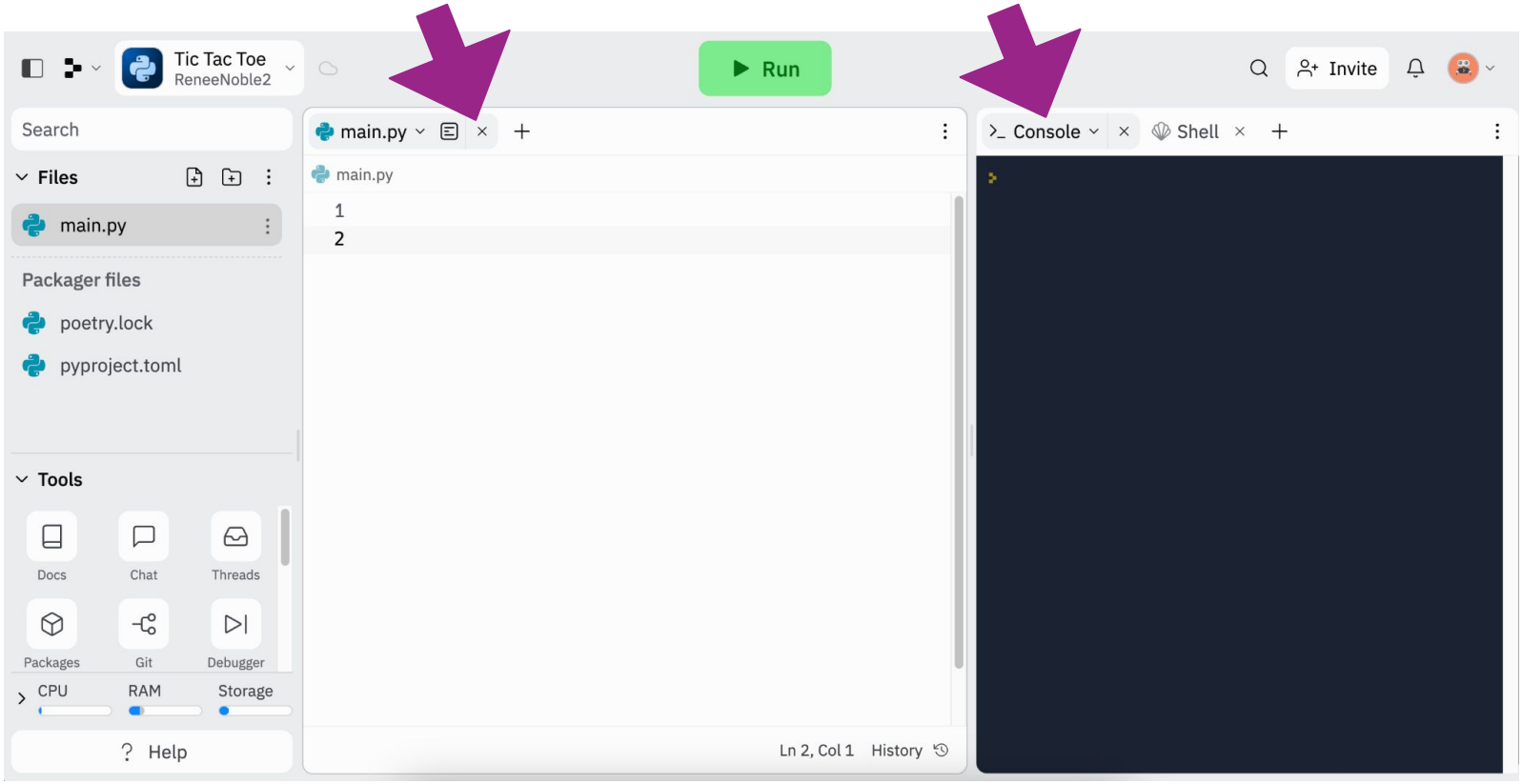
Name it after today’s project!



We're ready to code!

We'll write our project here in main.py

You can test out Python code in the console



Classes

What is an object?

What do you think an object is?

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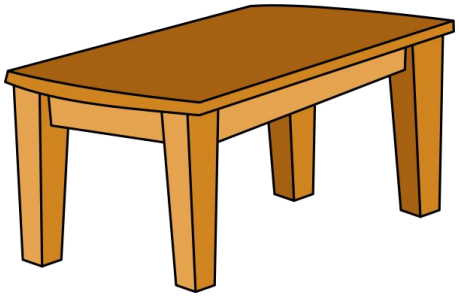
What do you think an object is?



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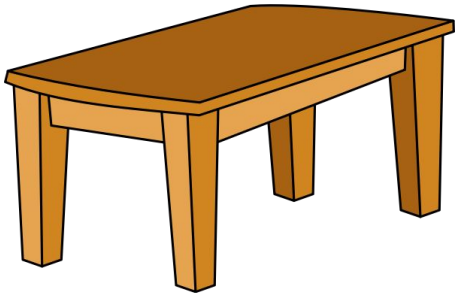

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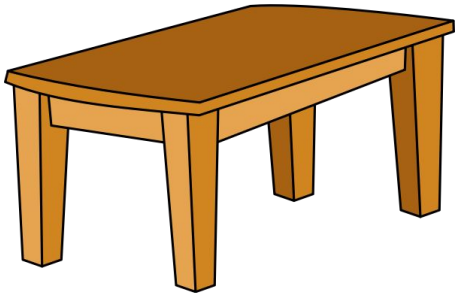

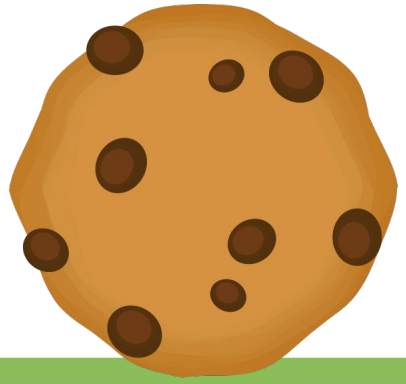

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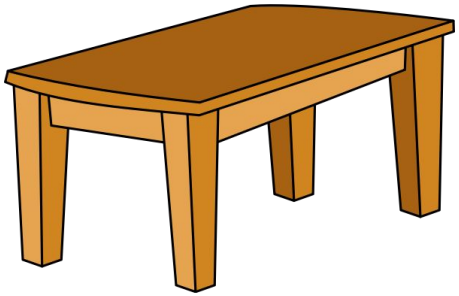

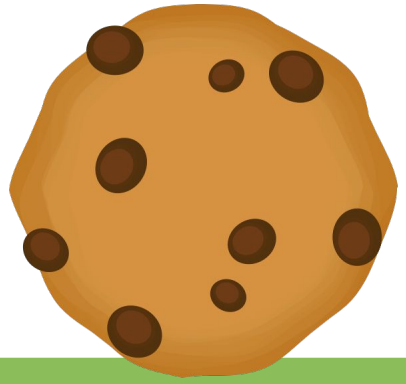

What is an object in code?

An object is something that we know information about and that can sometimes do things

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Like a cat!

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Like a cat!

What information might we know about a cat?

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name

Age

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name

Age

Colour

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name **Owner**

Age

Colour

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name

Owner

Age

Weight

Colour

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What information might we know about a cat?

Name

Owner

Age

Weight

Colour

Microchip #

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

Eat

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

Eat

Scratch

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

Sleep

Eat

Scratch

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

Sleep

Eat

Purr

Scratch

What is an object in code?

An object is something that we know information about and that can sometimes do things

Like a cat!

What things might a cat do?

Meow

Sleep

Eat

Purr

Scratch

Jump

What does that look like in Python?

Let’s have a look at how we might make a Cat object in Python code!

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Let's have a look at how we might make a Cat object in Python code!

```
class Cat():
    def __init__(self, name, age, colour):
        self.name = name
        self.age = age
        self.colour = colour
```

Here we tell python that we are making a new type (or class) of object called Cat

What does that look like in Python?

Let's have a look at how we might make a Cat object in Python code!

__init__ is how we tell Python how to make a new Cat

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour
```

What does that look like in Python?

Let's have a look at how we might make a Cat object in Python code!

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour
```

Here we tell Python what information we need to know about the Cat

Note: self is special and we always need it

What does that look like in Python?

Let's have a look at how we might make a Cat object in Python code!

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour
```

Here we save the information we got so we can use it again

What does that look like in Python?

How do we make a new Cat?

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour

emmy = Cat(“Emmy”, 3, “Dark brown”)
```

What does that look like in Python?

What does this print out?

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour

emmy = Cat("Emmy", 3, "Dark brown")
print(emmy.name)
print(emmy.age)
print(emmy.colour)
```

What does that look like in Python?

What does this print out?

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class Cat():
  def __init__(self, name, age, colour):
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emmy = Cat("Emmy", 3, "Dark brown")
print(emmy.name)
print(emmy.age)
print(emmy.colour)
```

```
Emmy
3
Dark Brown
```

I have more than 1 cat!

Emmy has a little sister, Saphira! Let's add her to our code too!

```
cat1 = Cat("Emmy", 3, "Dark brown")
cat2 = Cat("Saphira", 1, "Grey")
```

Cat Crime!

There has been a cat crime!

One of the cats has gotten on the kitchen counter and eaten some of my lunch!

They both look innocent but they left a hair behind at the scene of the crime! Let's write some code to work out who did it

Cat Crime

Who did it??

```
cat1 = Cat("Emmy", 3, "Dark brown")
cat2 = Cat("Saphira", 1, "Grey")

hair_colour = "Grey"

if hair_colour == cat1.colour:
  print("That hair belongs to", cat1.name)
elif hair_colour == cat2.colour:
  print("That hair belongs to", cat2.name)
```

Cat Crime

Who did it??

```
cat1 = Cat("Emmy", 3, "Dark brown")
cat2 = Cat("Saphira", 1, "Grey")

hair_colour = "Grey"

if hair_colour == cat1.colour:
  print("That hair belongs to", cat1.name)
elif hair_colour == cat2.colour:
  print("That hair belongs to", cat2.name)
```

```
That hair belongs to Saphira
```

Files

Filing it away!

What happens if we want to use different data in our program? What if that data is too big to write in with the keyboard?

We'd have to change our code!!

It would be better if we could keep all our data in a file and just be able to pick and choose what file we wanted to play today!

people.txt

```
Aleisha,brown,black,hat
Brittany,blue,red,glasses
Charlie,green,brown,glasses
Dave,blue,red,glasses
Eve,green,brown,glasses
Frankie,hazel,black,hat
George,brown,black,glasses
Hannah,brown,black,glasses
Isla,brown,brown,none
Jackie,hazel,blonde,hat
Kevin,brown,black,hat
Luka,blue,brown,none
```

Opening files!

To get access to the stuff inside a file in python we need to **open** it!

That doesn't mean clicking on the little icon!

```
with open("test.txt", "r") as f:
```

You'll now be able to read the things in f

If your file is in the same location as your code you can just use the name!

A missing file causes an error

Here we try to open a file that doesn't exist:

```
with open("missing.txt", "r") as f:
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
IOError: [Errno 2] No such file or
directory: 'missing.txt'
```

You can read in one line at a time

You can use a for loop to read 1 line at a time!

```
with open("haiku.txt", "r") as f:
    for line in f:
        print(line)
```

```
Wanna go outside.

Oh NO! Help! I got outside!

Let me back inside!
```

Why is there an extra blank line each time?

Chomping off the newline

The newline character is represented by '\n':

```
print('Hello\nWorld')
Hello
World
```

We can remove it from the lines we read with .strip()

```
x = 'abc\n'
x.strip()
'abc'
```

x.strip() is safe as lines without newlines will be unaffected

Reading and stripping!

```
with open("haiku.txt", "r") as f:
    for line in f:
        line = line.strip()
        print(line)
```

```
Wanna go outside.
Oh NO! Help! I got outside!
Let me back inside!
```

No extra lines!

Project time!

I hope you **`file`**d that knowledge away

Use it in the next section of the project!

Try to do the next Part

The tutors will be around to help!

Methods

This is how we make our classes DO things

What about doing things?

We said an object was something with information that could sometimes do things. Our Cat object doesn't do anything right now - let's add a way for it to meow!

What about doing things?

We said an object was something with information that could sometimes do things. Our Cat object doesn't do anything right now - let's add a way for it to meow!

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour

  def meow(self):
    print("Meow")
```

What about doing things?

What does this code do?

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class Cat():
  def __init__(self, name, age, colour):
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emmy = Cat("Emmy", 3, "Dark brown")
emmy.meow()
```

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```

Meow

What else can it do?

Let’s have our cat have a Birthday that makes it get older by 1 year!

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class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
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  def meow(self):
    print("Meow")

  def birthday(self):
    self.age = self.age + 1
```

What else can it do?

What does this code do?

```
class Cat():
  def __init__(self, name, age, colour):
    self.name = name
    self.age = age
    self.colour = colour

  def meow(self):
    print(“Meow”)

  def birthday(self):
    self.age = self.age + 1

emmy = Cat(“Emmy”, 3, “Dark brown”)
emmy.birthday()
print(emmy.age)
```

What else can it do?

What does this code do?

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  def meow(self):
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    self.age = self.age + 1

emmy = Cat("Emmy", 3, "Dark brown")
emmy.birthday()
print(emmy.age)
```

4

Syntax cheatsheet

```
class MyClassName:
  staticVariable = someValueForEveryInstance
  def __init__(self, param1, param2...):
     # Set the instance variables
     self.myParam1 = param1
     self.someOtherValue = param2
  def someFunc(self, otherParam1, otherParam2...):
     # Do stuff here
     # You can even return values if you like!
```

Syntax cheatsheet

```
# Access static variables
MyClassName.staticVariable

# Create new instance of a class
mine = MyClassName(param1, param2...)

# Access an instance variable or function
mine.myParam1
mine.someFunc(otherParam1, otherParam2...)

# Store values from functions that return something
someValue = mine.someFunc(otherParam1, otherParam2...)
```