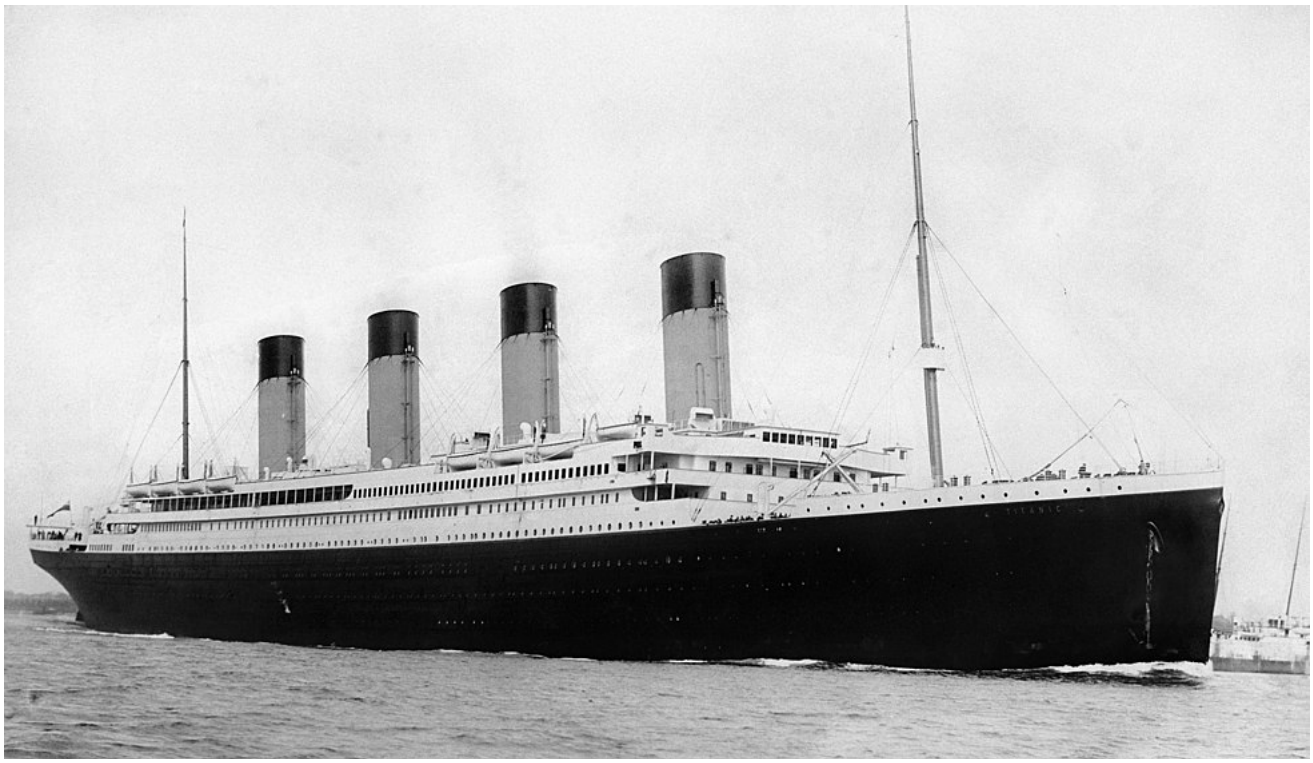
Titanic

The *RMS Titanic* sank in the North Atlantic Ocean in 1912 during her maiden voyage from Southampton to New York. More than 1,500 of the 2,220 passengers and crew died when the ship sank.

In this project you will make a Python program that can predict whether a specific passenger survived.

You'll use machine learning to train a predictive model using information about hundreds of examples of the passengers.



1. Go to https://machinelearningforkids.co.uk/ in a web browser

2. Click on "**Get started**"

3. Click on "**Log In**" and type in your username and password

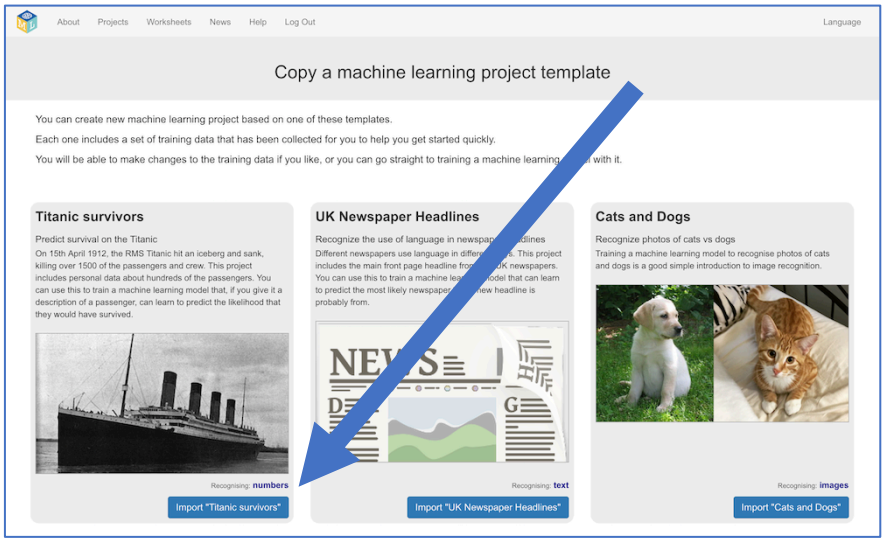
If you don't have a username, ask your teacher to create one for you. If you can't remember your username or password, ask your teacher or group leader to reset it for you.

4. Click on "**Projects**" on the top menu bar

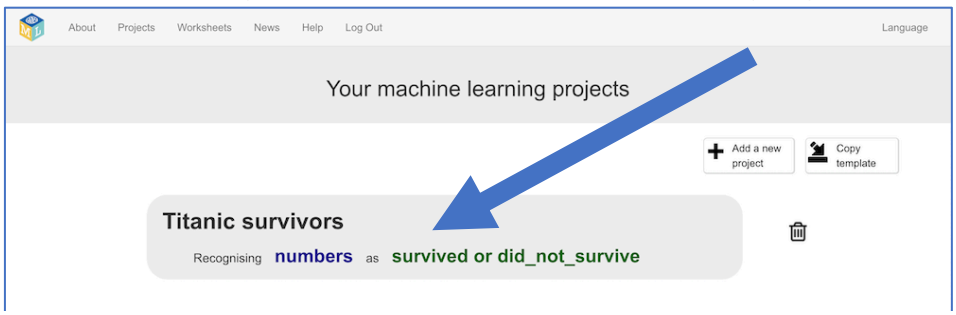
5. Click the **"Copy template**" button.

6. Find the **Titanic survivors** project template and click on the "**Import Titanic survivors**" button.

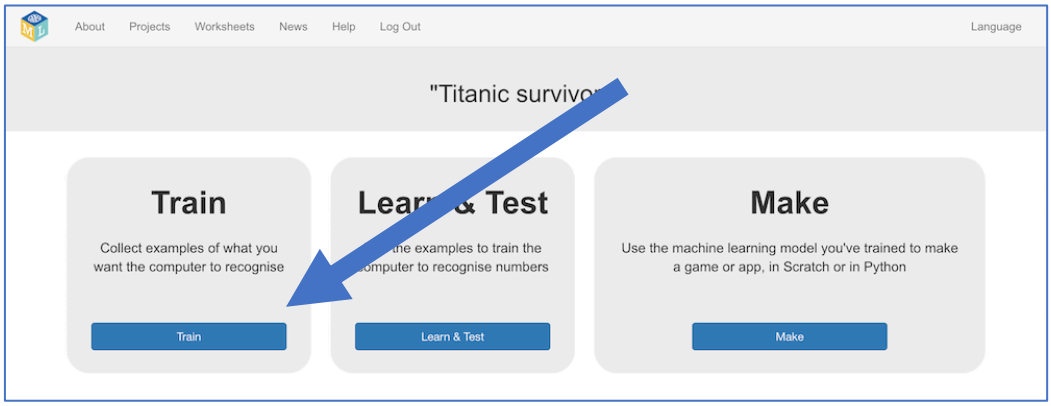
A description of the passenger data is displayed. Click "Import".



7. Click on your new "**Titanic survivors**" project

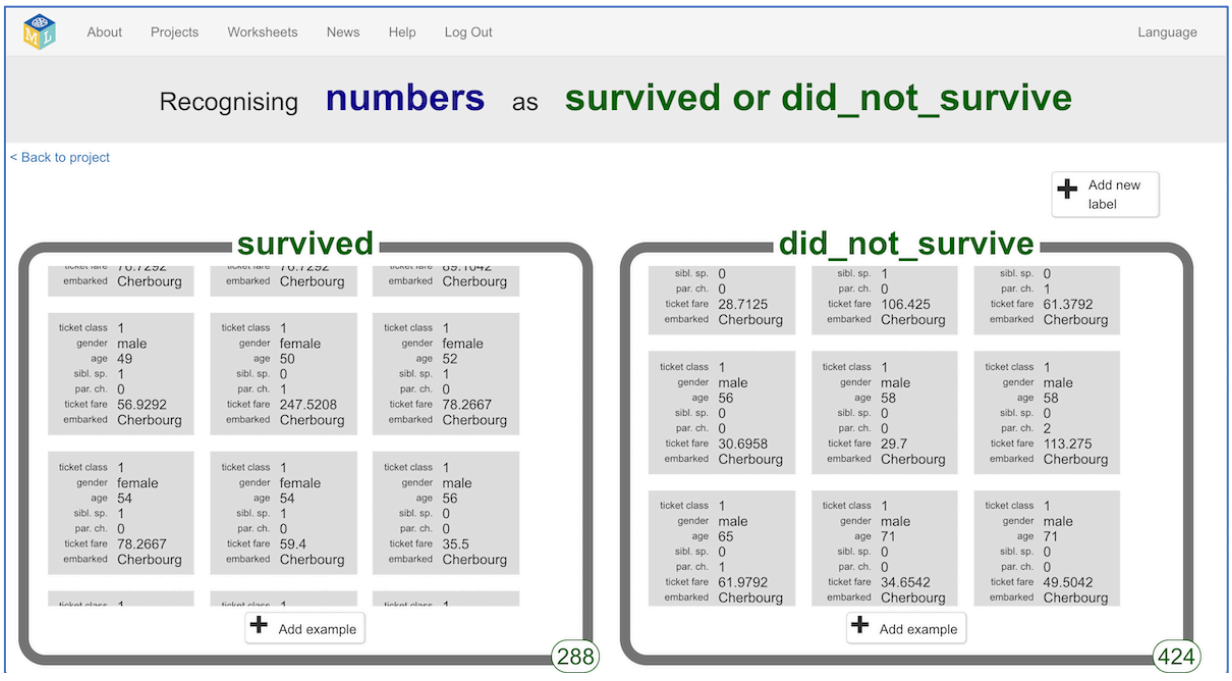


8. Start by displaying the training data that you've just copied. Click the "**Train**" button.



9. There are two training buckets.
"**survived**" contains examples of passengers/crew who survived.
"**did_not_survive**" bucket contains examples of people who did not.
Each example gives you some information about the person:

ticket class	1, 2, 3	Did they have a first class, second class, or third class ticket?
gender	male, female	Were they male or female?
age	age in years	How old were they?
sibl. sp.	siblings or spouses	If they're a child, how many brothers and sisters were also on board? If they're an adult, 1 if they had a husband or wife with them, or 0 if not
par. ch.	parents or children	If they're a child, how many parents they had on board with them. If they're an adult, how many children they had on board with them.
ticket fare	cost in pounds	How much did their ticket cost?
embarked	Cherbourg, Southampton, Queenstown	Where did they get on board? Cherbourg (France), Southampton (England), or Queenstown (Ireland)?



10. Review the training examples. Can you see any patterns in the data? Are there any common differences between passengers that survived, and passengers that didn't?
For example, have you heard the phrase "Women and children first!" If that was really how the passengers and crew were got to the lifeboats, what sort of pattern would you expect to see in the training examples? Can you find that sort of pattern in the data in your project?

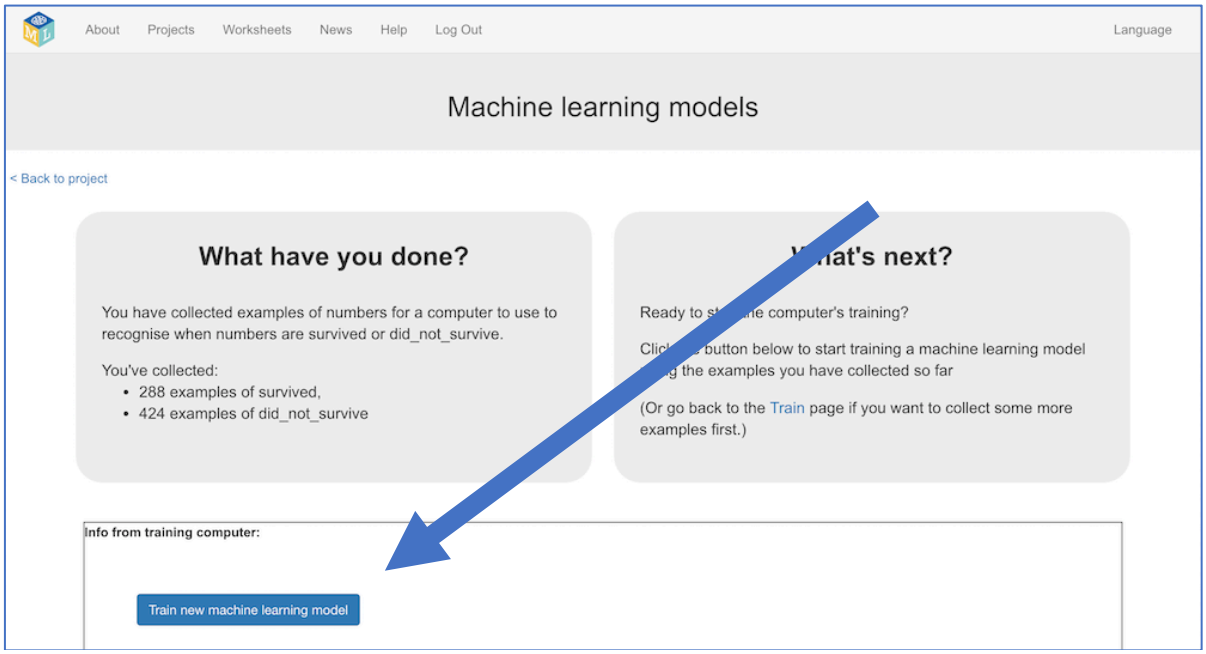
What other patterns can you think of? For example, do you think passengers with more expensive tickets would have a better or worse chance of surviving the sinking?

Try to predict what sorts of patterns your machine learning model could learn to recognize. And then look to see if you can find that sort of pattern in your training data.

11. Click on the **"< Back to project**" link.

12. Click on the "**Learn & Test**" button.

13. Click on the "**Train new machine learning model**" button.
The example passenger data will be used to train a predictive model.



We'll test your model using the characters from the 1997 movie, *Titanic*.

Jack Dawson (played by Leonardo DiCaprio)
Jack was a 20 year-old man.
He paid nothing for his third-class ticket, because he won it in a poker game.
He boarded RMS Titanic in Southampton, in England.
He had become an orphan when he was 15, and had no other family on board.

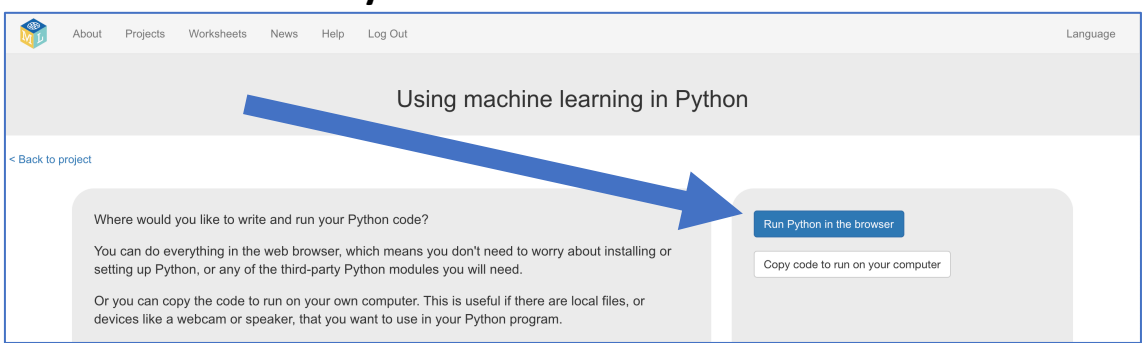
Rose DeWitt-Bukater (played by Kate Winslet)
Rose was a 17 year-old woman.
She had a first-class ticket. The film doesn't mention exactly how much it cost, but based on the room that she had, we can estimate her ticket cost £450.
She boarded the ship in Southampton, England.
She came on board with her mother and her fiancé. She didn't have any brothers or sisters on board.

14. Click the "**< Back to project**" link

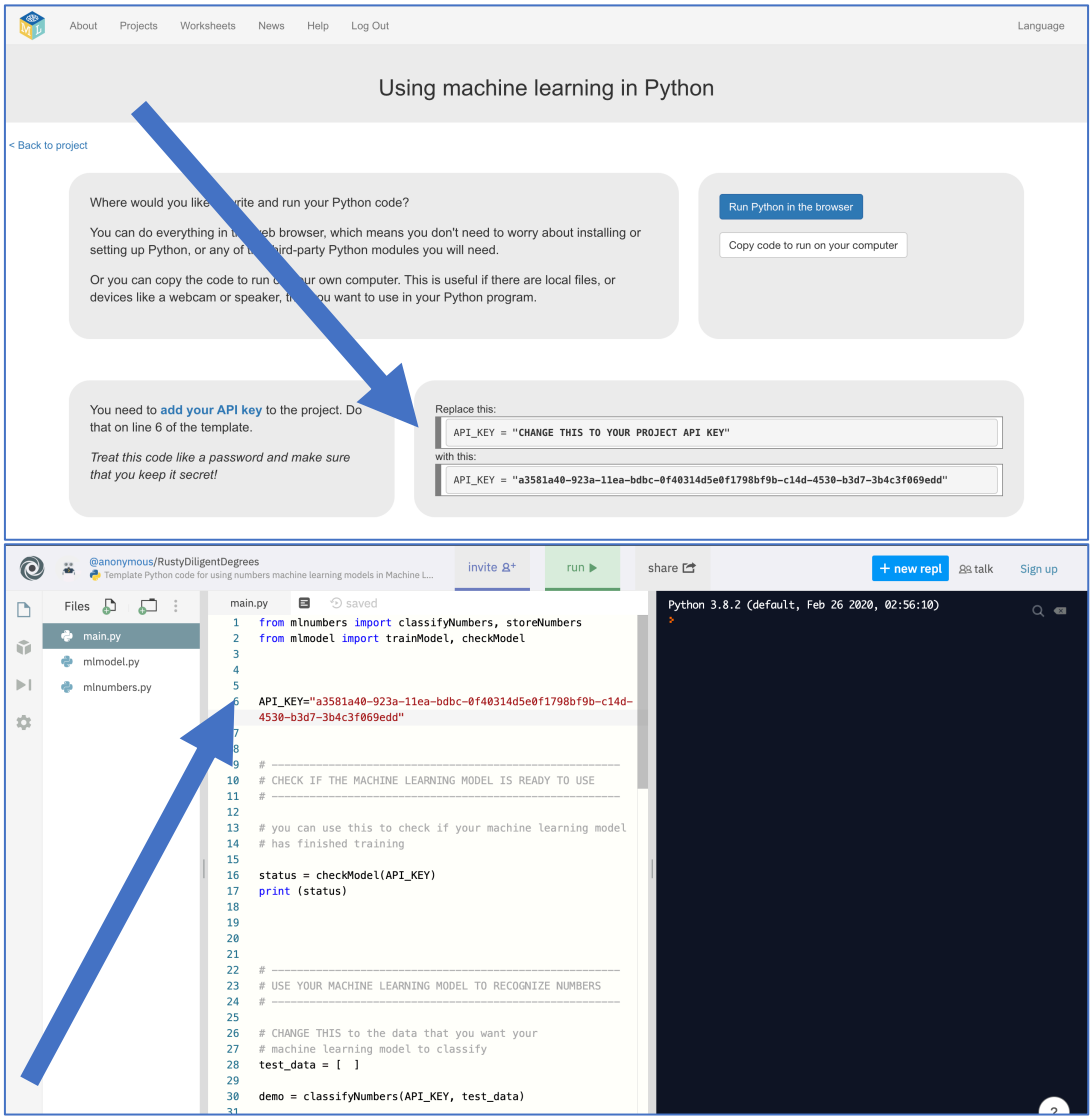
15. Next, we'll use Python. Click "**Make**"

16. Click on the **Python** button

17. Click on "**Run Python in the browser**"

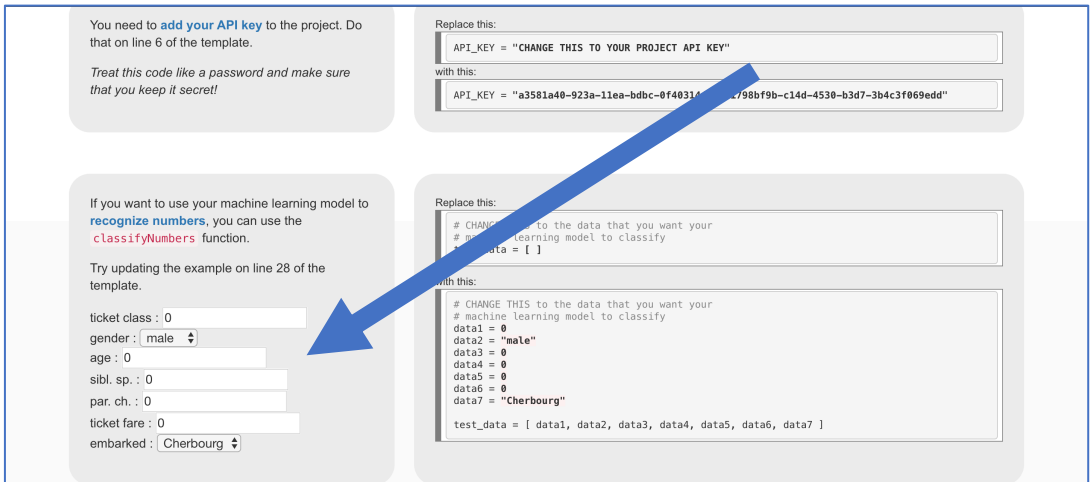


18. Follow the instructions for adding your API key to the code

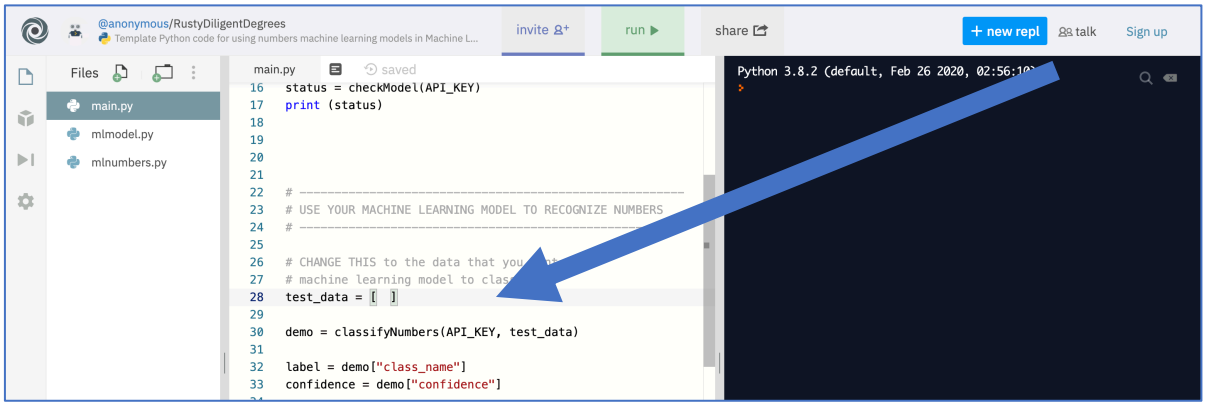


19. Fill in the information about the Jack Dawson character in the fields displayed on the left.

This will update the skeleton code on the right.



20. Copy the updated skeleton code displayed into the template.



21. Update this line from the template code:

```
print ("result: '%s' with %d%% confidence" % (label, confidence))
```

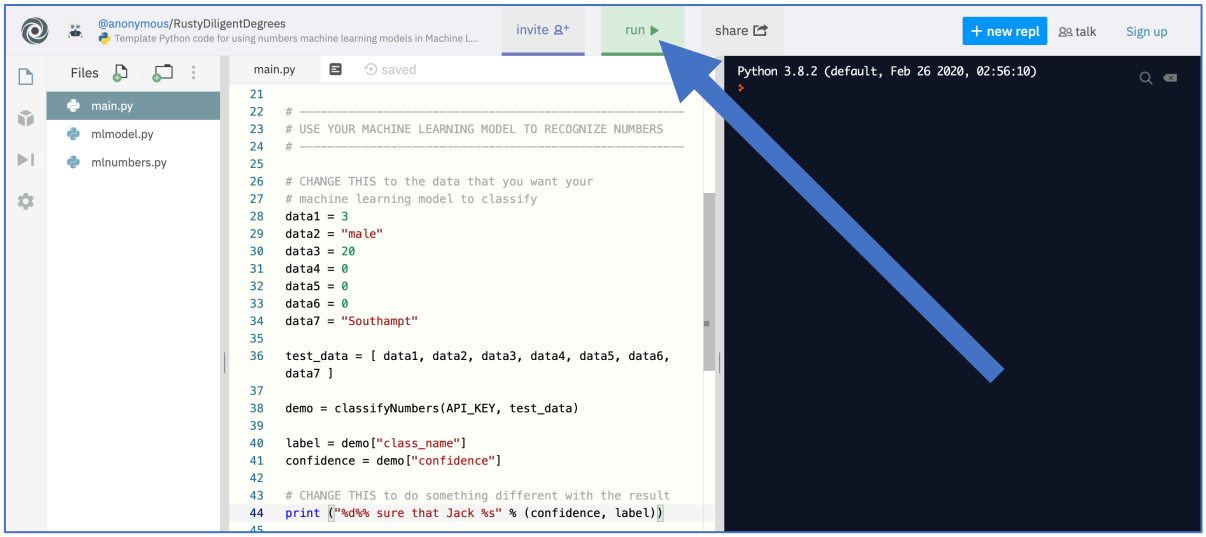
Change it to this:

```
print ("%d%% sure that Jack %s" % (confidence, label))
```

22. Click on the “run” button

Your machine learning model will display its prediction for whether Jack survived the sinking of the Titanic.

Does the prediction match what happened in the movie?



23. Try doing the same for Rose's character in the movie.
Fill in the information about Rose's character in the webpage boxes, and update the template code with it.

Update the last line of code to say:

```
print ("%d%% sure that Rose %s" % (confidence, label))
```

Your machine learning model will display its prediction for whether Rose survived the sinking of the Titanic.

Does the prediction match what happened in the movie?

What have you done?

You've used a historical set of information about passengers and crew of the RMS Titanic to train a predictive model. That predictive model used the patterns in your historical training data to learn to recognize patterns in what sort of passengers survived or not.

When you looked for patterns in the training data, you hopefully thought about possible reasons to explain it. For example, younger passengers were more likely to survive because children would've been prioritized when boarding lifeboats. Computers won't have done that last bit. The computer will hopefully have seen the pattern between age and survival but won't have tried to explain it. A machine learning model will learn to recognize patterns in the data, but they won't care about why.

Finally, you made Python programs to test your predictive model, using information about fictional Titanic passengers from the movie, Titanic.

Ideas and Extensions

Now that you've finished, why not give one of these ideas a try?

Or come up with one of your own?

Try testing with other passengers

Can you find any information about other Titanic passengers or crew that you can test your predictive model on?

Invent your own predictive model

Can you think of another topic that you could collect numerical or multiple-choice values about?