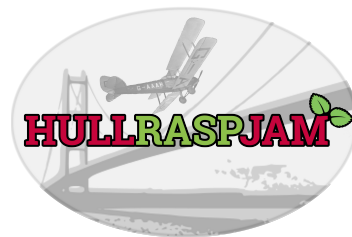# SCRATCH SORTING HAT

Choosing a house

We are going to make a Scratch animation of the Sorting Hat from Harry Potter, which will randomly select which house you should be in at the press of a button.
We will learn about a number of things; loops, random selection, conditional statements, variables and lists.
First we will start off by looking at the loops, random selection and conditional statements we need for this to work.

1 Open Scratch from the "Programming > Scratch" menu on your Raspberry Pi. You now need to open the Scratch project. The sprite, background and sound we are going to use for this are already setup for you.
Browse for the file in "Documents > Scratch Sorting Hat > Starting File.sb"

2 To randomly select our house names we will need two variables. A variable is something we can create in our program which consists of two parts; a name and a value. The name can be whatever we want it to be, but it makes sense to keep it descriptive! Importantly the value of our variable can change during the course of our program.
Select the "Variables" panel from the top left of your Scratch window and select "Make a variable" to create your variables.
Create two variables called "house" and "name"

3 We want our program to keep running once it starts so we will use a loop to contain all of our blocks. We also want the Sorting Hat to only run when we press a certain button.
Add the following blocks to the Scripts area of your SortHat sprite.
If you run your program and press the space bar, you should hear the sound, but we don't see the "Hmm.." message!
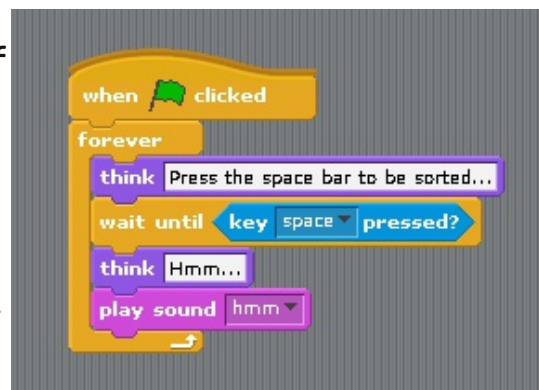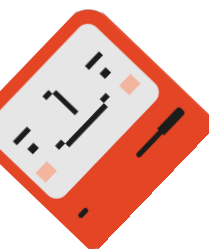
4 We can fix the message not displaying by inserting a "wait" block. We will use a random selection so that our Sorting Hat thinks for a different amount of time each time when press the space bar. We will then set the value of the "house" variable randomly to a number between 1 and 4. Update your blocks so they match this.

If you run your program now you should see all your messages and also see the value of the "house" variable change.

5 We are now going to use a set of conditional statements to check our house variable and set the name variable accordingly. A conditional statement is a piece of our program which will only run if our condition is true.

Add the four if blocks shown to the end of your loop.

When you run your program now you should see the value of the "name" variable change each time a new selection is made.

We are getting closer!

6 Now we are going to make a list of phrases the sorting hat might say when putting you in a house. We will then select any of these phrases and add our selected house name to the phrase so we get a different message each time.

From the variables panel, select "Make a list" and call it "houseAnnouce". Your new empty list will appear on your stage along with a lot of new blocks in the variables panel.
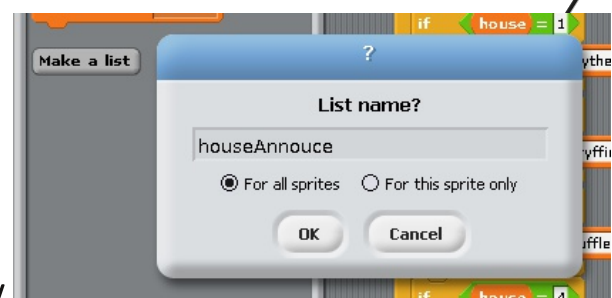
Next we are going to add our phrases to this list.

7 In the stage, click on the plus sign in the bottom left of your houseAnnouce list eight times. You then need to add eight phrases into your list. Be sure to leave a space at the end of each phrase. You can see the phrases I added here.

houseAnnouce	
1	You are in
2	The house for you is
3	You belong in
4	We had better put you in
5	How about... Yes...
6	Easy! Definitley at home in
7	Just like your parents before you, you are in
8	Your wit and cunning places you in

Once you have all your phrases added to your list, you can click the tick in the variables panel, next to your list name, to hide it from the stage as we don't need to see the list. You can also untick the "house" and "name" variables to hide them from our stage too.

8 We are now going to use something call concatenation (which is just a fancy word for "joining things together") to make our Sorting Hat annouce which house you will be.

Add the following blocks at the end of your loop. Here we are telling our sprite to say a phrase which consists of any item from our houseAnnouce list joined to the current value of the "name" variable with an exclamation mark added to the end.

If you click the green flag now you should have a working Sorting Hat program! In the next sections we can take the program a little further.

9 We can now animate our hat so that it's mouth moves as it annouces the house.

First off we will need a new variable called "speak" to indicate when we want the Sorting Hat to speak. Create this in your Variables pane; you can deselect it straight away as we don't need to see it on our stage.

You can now create these blocks on your scripts panel. You can see we are checking the value of "speak" inside our loop and if it equals 1 we are then randomly selecting a costume for the hat. I have created four different costumes for the hat already which move the move around. You can edit these if you like.
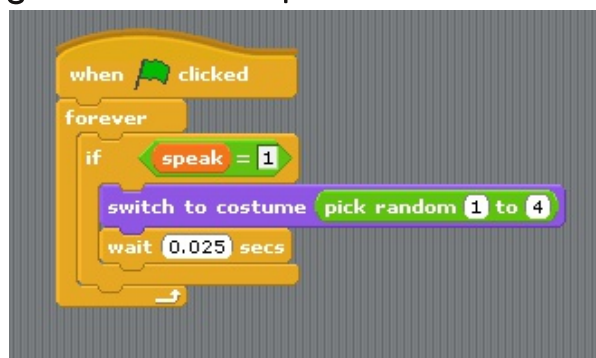
There is one last step to get these to work. We need to switch the speak variable on and off when we want our hat to speak. Inside each "if house =" block you need to add a "set speak to 1" block and then add a "set speak to 0" block after the house annoucement block. You can see this for the Ravenclaw if block here. Be sure to add the same to the other three houses.

Give your program a test. Does the mouth move at the right time?
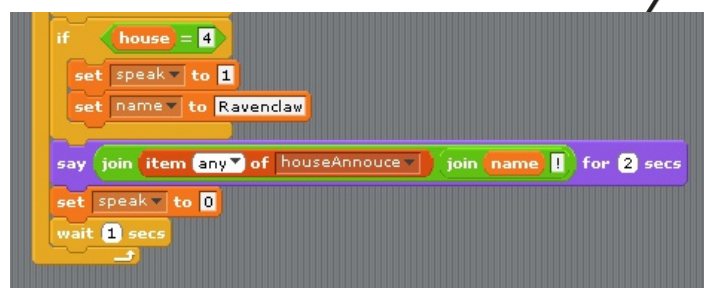
Final Challenge

10 Can you create a running total for each house so we know how many have been sorted?

Tip: You will need four more variables which you will want to display on your stage!