The Perceptron

Computers can do a lot of cool things, such as recognize faces, tell you what's in a picture, and even recommend restaurants!

But do you ever wonder how computers can do that?

Designed by James Skripchuk

Imagine this. You're walking around outside and all of a sudden you see an animal that you've never seen before. You don't know what it is, but you look closer and see it has a tail, has fur, is on a leash and barks. You say to yourself: *"What animal has a tail, fur, is on leashes, and barks? Dogs!"*

This is how the **Perceptron Algorithm** works. The **Perceptron Algorithm** is a set of steps a computer can follow that - if you describe what you're looking at, it will try and tell you what that thing is based on the parts it sees and how important the parts are. The perceptron can only answer **YES** or **NO** questions, but that doesn't stop it from being useful. The Perceptron can be split into three main steps:

1) The Voters

5

10

1
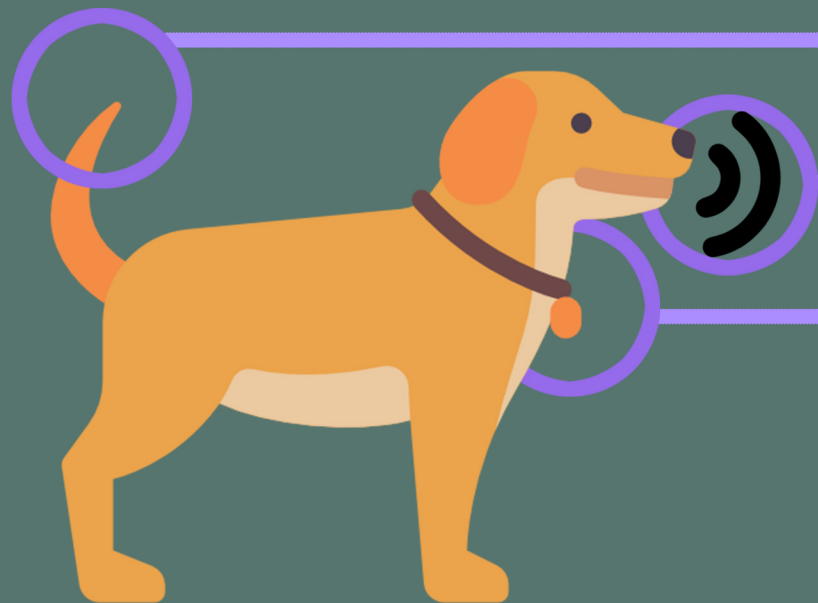
Each voter's job is to look for one thing and one thing only. One voter may be asked to look for a tail , while another voter may be asked to listen for barks. If the voter sees that the object does indeed have what they're looking for, the voter votes **YES**, otherwise they vote **NO**.
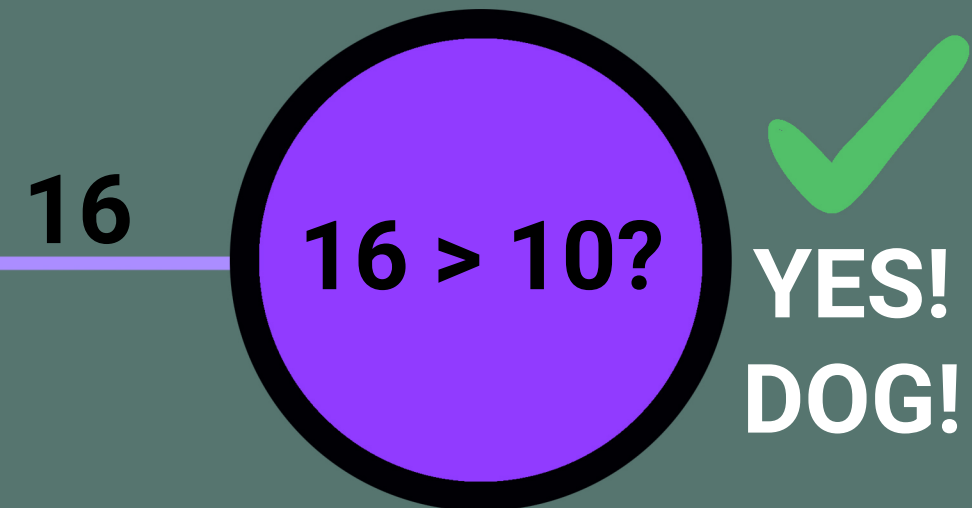
2) The Adder

5+10+1
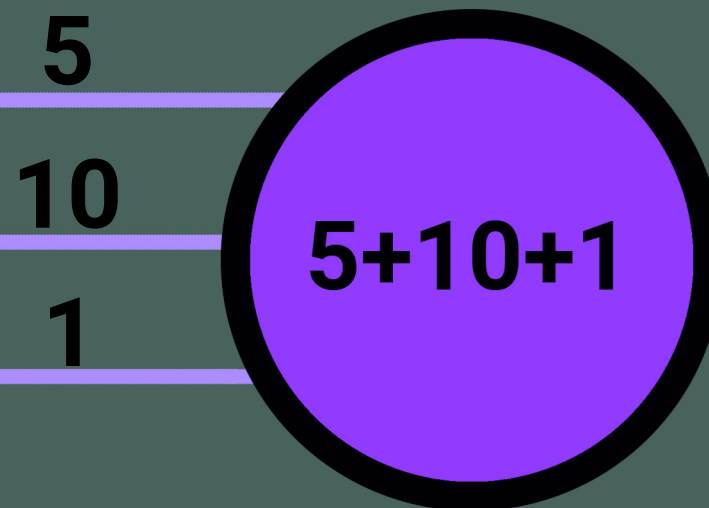
The Adder adds together all of the **YES** votes that it gets from the voters. The Adder also has a special job where it also decides how important each voter's vote is.

Having fur is important for a dog, *but a lot of other animals also have fur!* But, if something barks, *that's a pretty clear sign that something is a dog!*

Since barking is very important to detect dogs, the Adder says that one barking vote should actually be worth 10 total votes!

3) The Decider

16

16 > 10?

YES! DOG!

If our object has a lot of "dog-like" parts, then the Adder will give a lot more votes than something without a lot of "dog-like" parts. The Decider's job is to make the final decision and give us the final answer of **YES** or **NO.**

The Decider takes the number from The Adder and compares it to a secret number that never changes. If the Adder's number is bigger than the secret number, The Decider tells us **YES.** Otherwise, it tells us **NO.**