

How do GANs work? Step 1

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# How Do GANs Work?

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## How Do GANs Work?

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Generative  
Adversarial  
Network

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# How Do GANs Work?

Generative

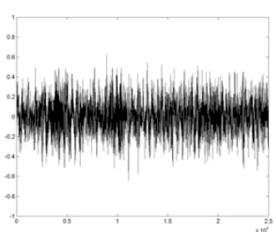


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# How Do GANs Work?

Generative



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noise

# How Do GANs Work?

## Generative



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image

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## Adversarial

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# How Do GANs Work?

## Adversarial



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# How Do GANs Work?

## Adversarial

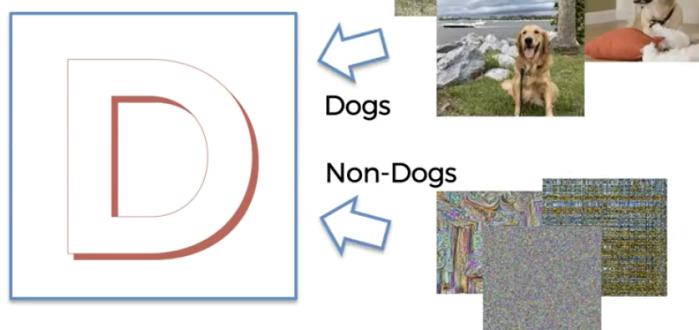


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# How Do GANs Work?

## Adversarial



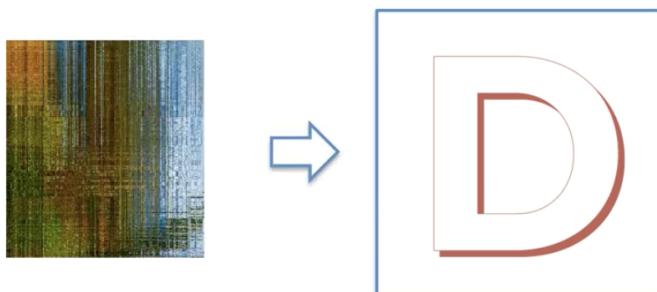
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Imagine this as Detector in which will detect whether the images are actually dog or not. Over times this will change too for better.

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## Adversarial

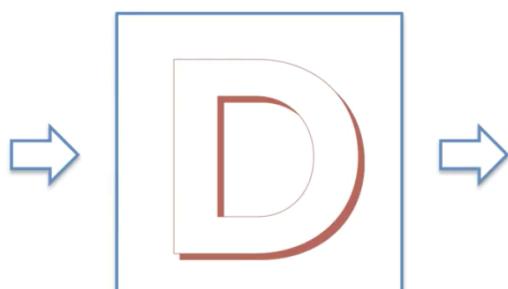
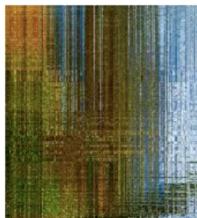


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# How Do GANs Work?

## Adversarial



0

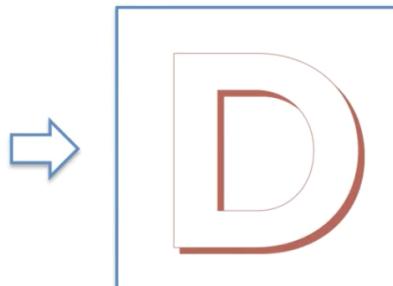
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It means this is not dog

# How Do GANs Work?

## Adversarial

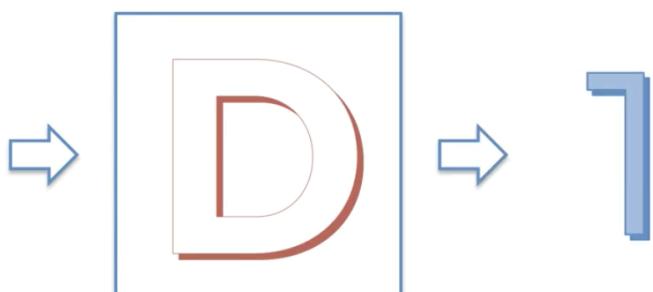


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# How Do GANs Work?

## Adversarial



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This means this is dog

# How Do GANs Work?

## Network

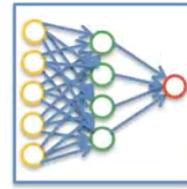
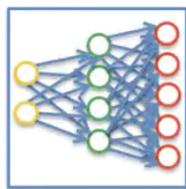


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# How Do GANs Work?

## Network



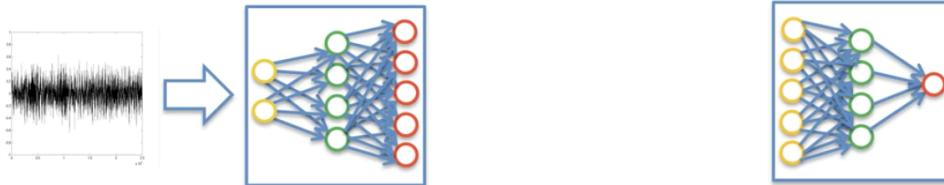
# How Do GANs Work?

Step: 1

In practical world, it goes through these steps thousands of times. Every step is an iteration and it is different than the epoch.

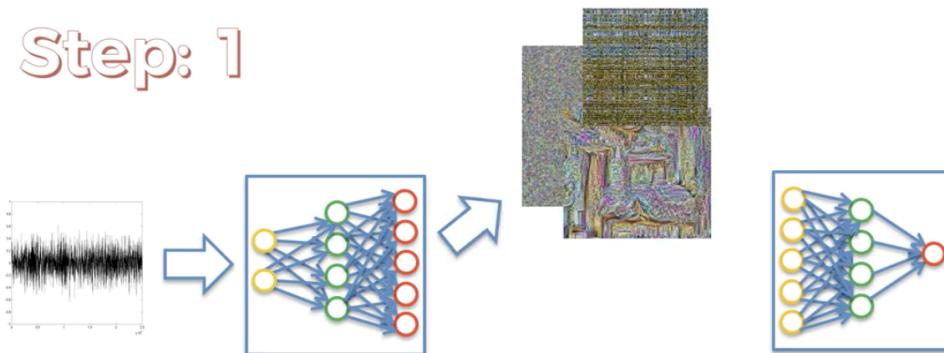
# How Do GANs Work?

## Step: 1



# How Do GANs Work?

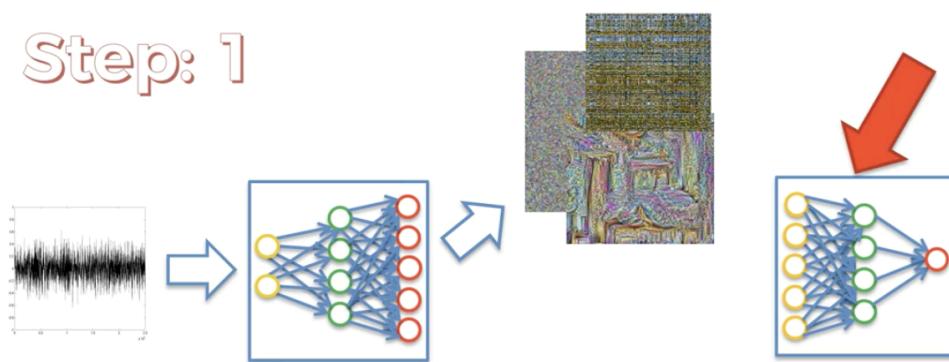
## Step: 1



After giving the noise the network will give image.

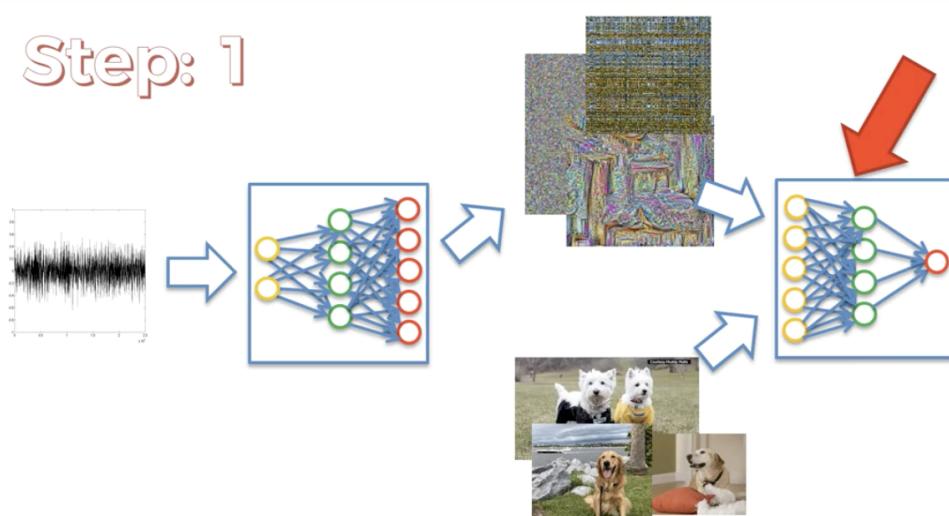
# How Do GANs Work?

## Step: 1



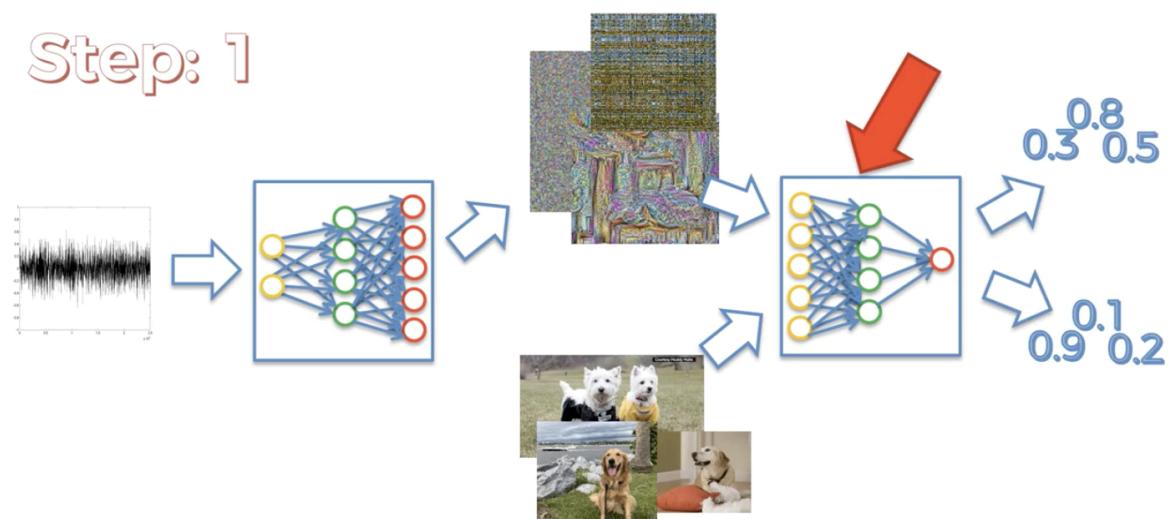
# How Do GANs Work?

## Step: 1



# How Do GANs Work?

## Step: 1



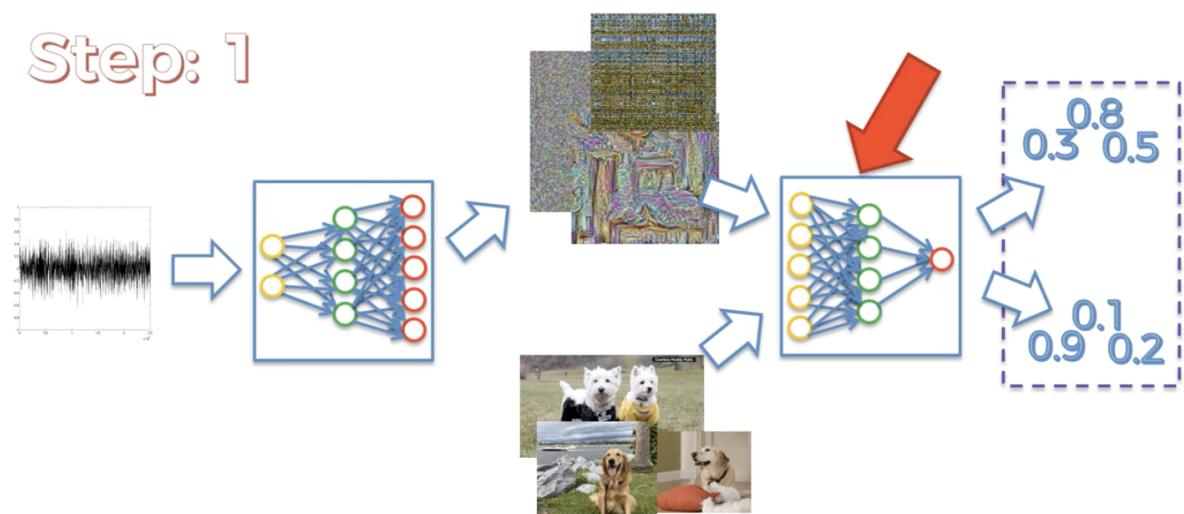
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In here the network will give some random probabilities. These probabilities are in two parts in which the first one is the probabilities for the images above and the second one is for the images below which in hers Is dog.

# How Do GANs Work?

## Step: 1

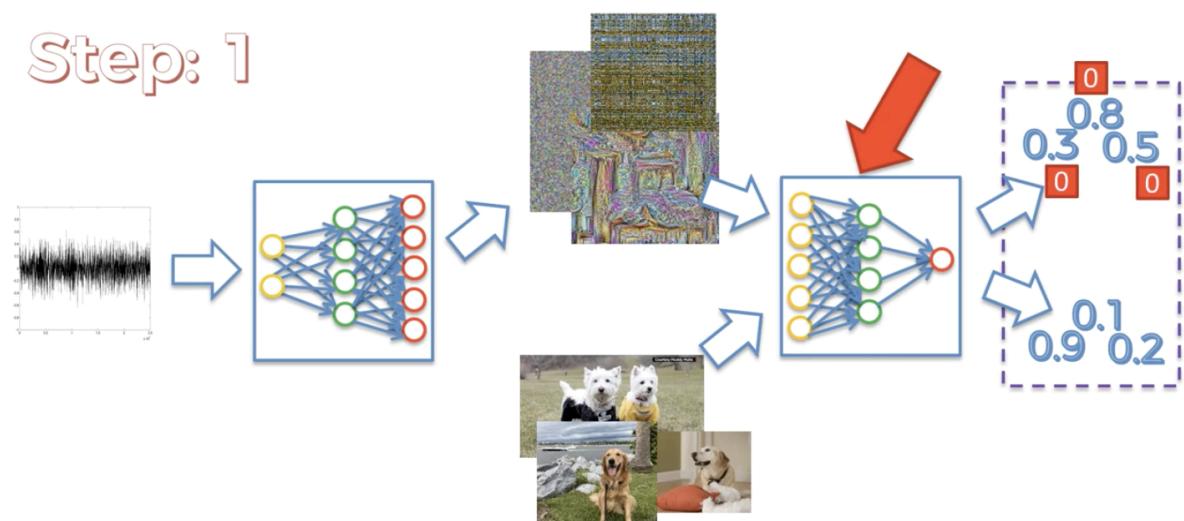


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# How Do GANs Work?

## Step: 1



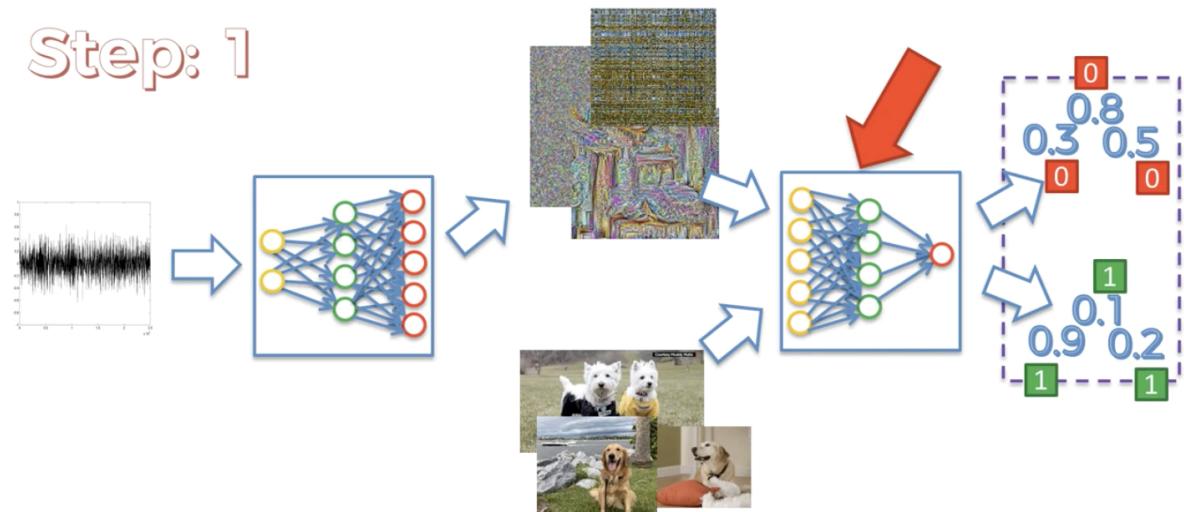
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In the ideal world for us humans the top images are 0 and below are one because one of them are dog and the other one is not. Which we distinguish it as 100% dog and 0% dog to the below image.

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## Step: 1



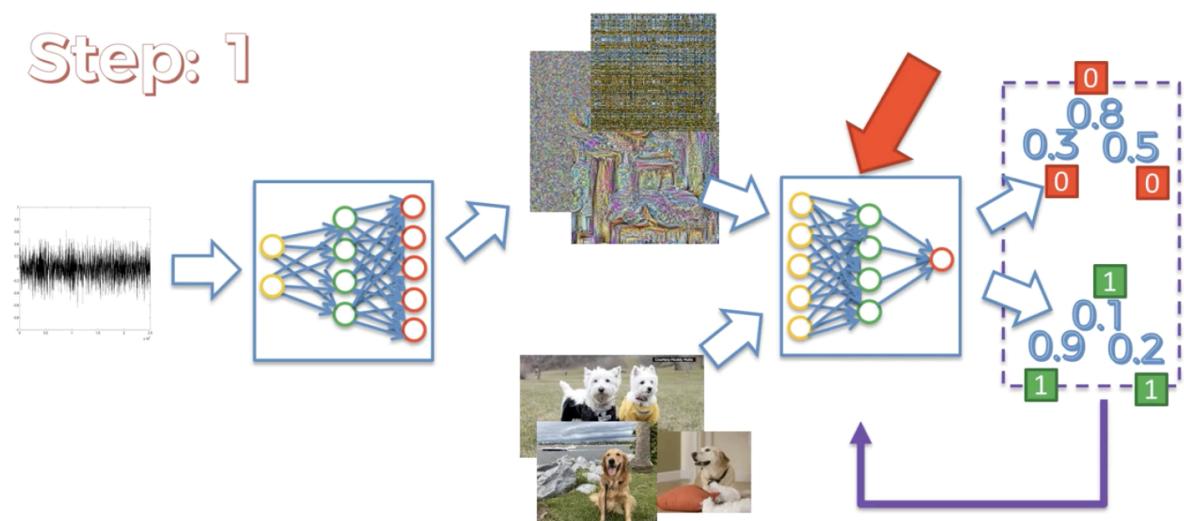
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Now the model is not ideal but it can learn from this.

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## Step: 1



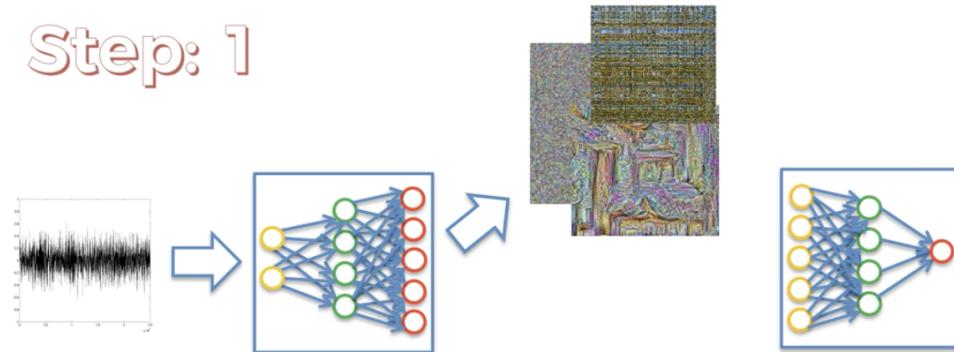
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Now for improving the model, we do the backpropagation so the network on the right side get improved.

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## Step: 1

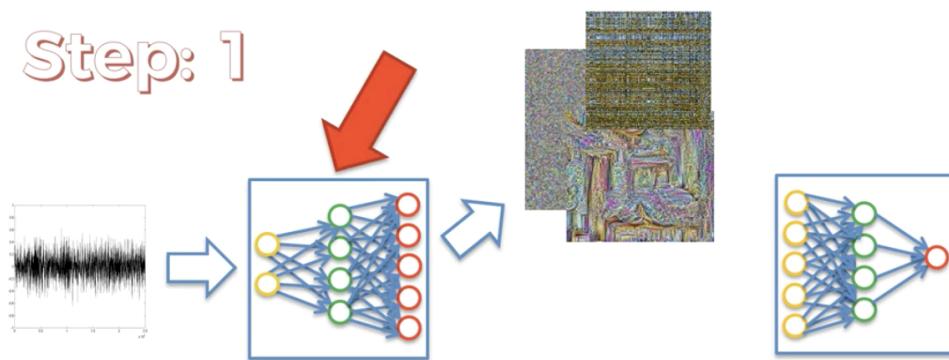


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# How Do GANs Work?

## Step: 1



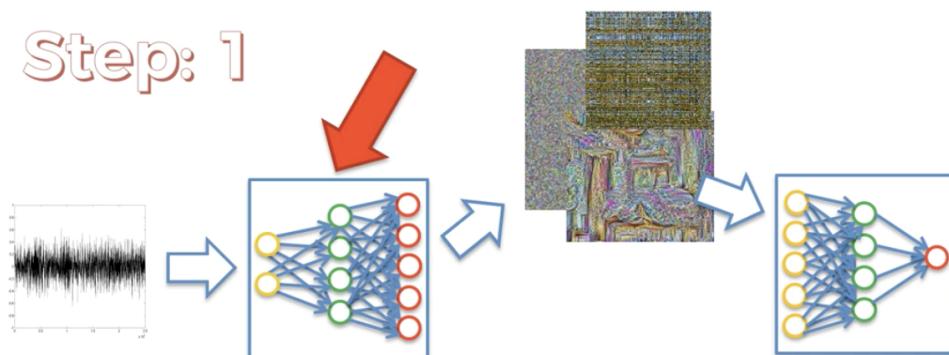
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Afterward we want to train the generator to improve its network.

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## Step: 1



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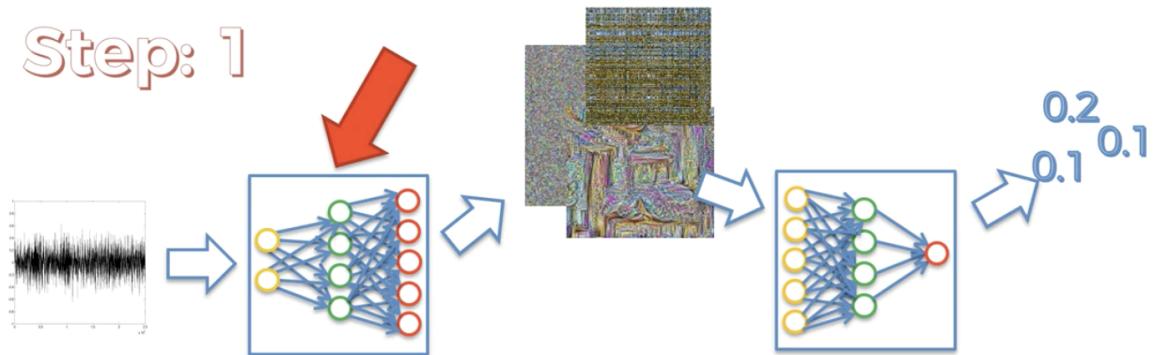
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Now we take the same images that were generator (supposed to be dogs) and put them into the discriminator again but this time there is going to be no dog images. Because now we are trying to trick the discriminator.

(this method is a little different than the method published by Ian Goodfellow's paper).

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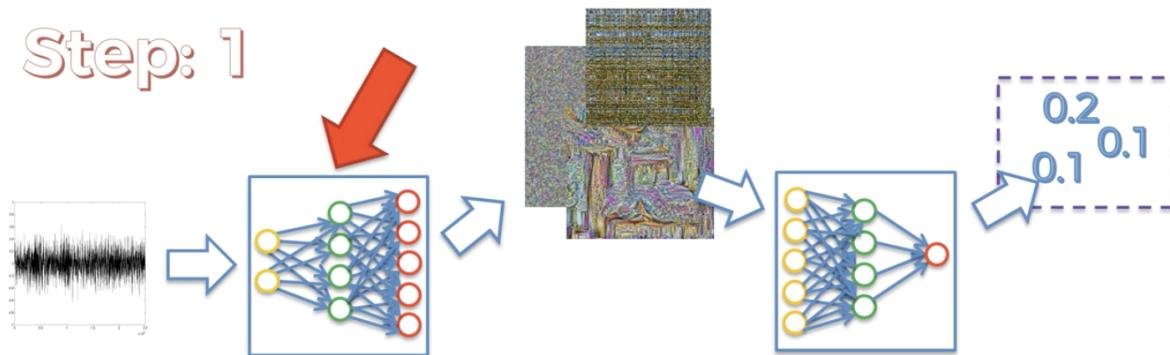
Step: 1



Now the discriminator provides a new outcome because it has been once trained already.

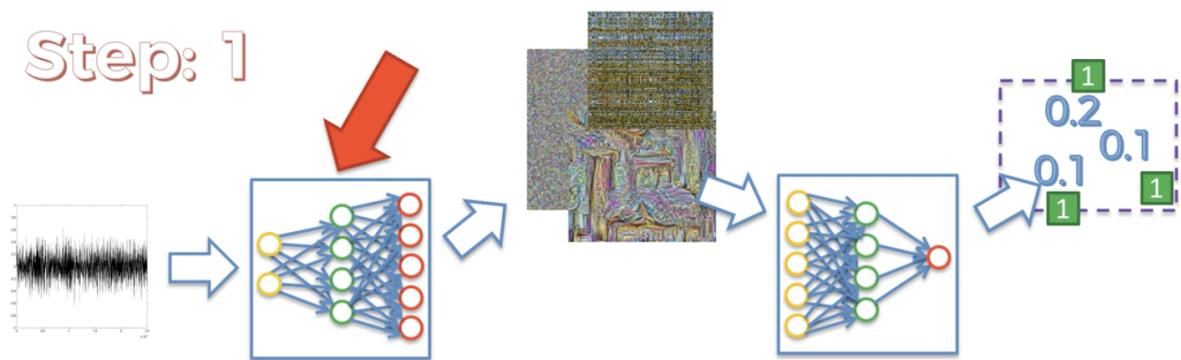
# How Do GANs Work?

Step: 1



# How Do GANs Work?

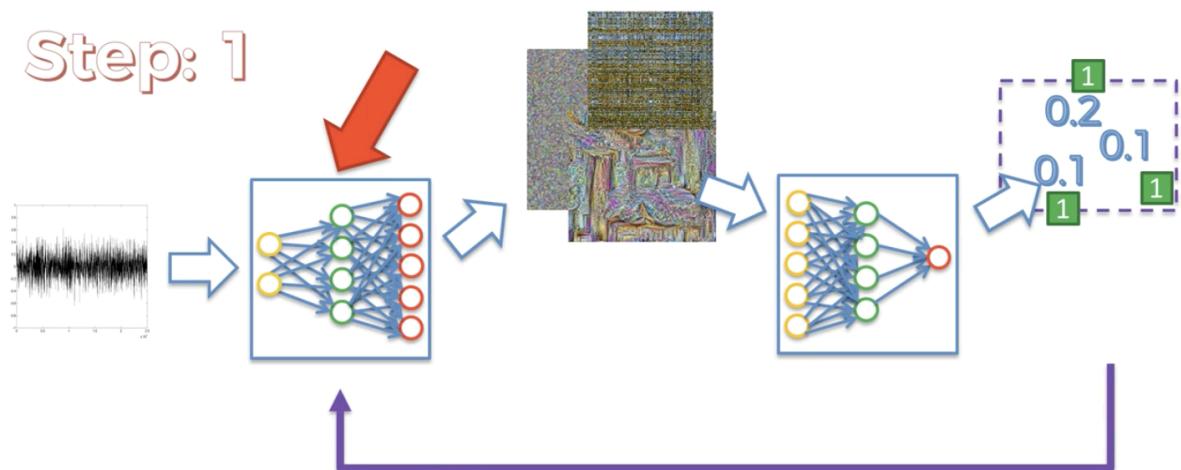
## Step: 1



Now instead of considering them as 0, we consider them as 1 to do the trick. But this time...

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## Step: 1



we do the backpropagation on the first network and not the second network.