COSC 499 Milestone 4

Team 9 order of aesthetics - section 003

Algorithm used to compare images

Recall: How to build a neural network

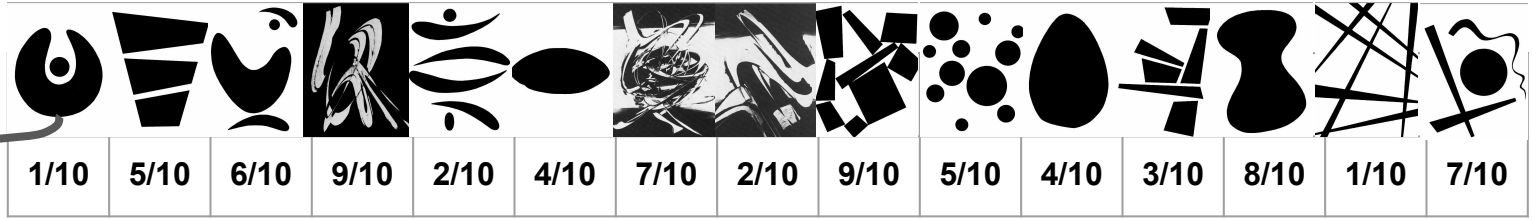
Start with unlabeled data

Recall: How to build a neural network

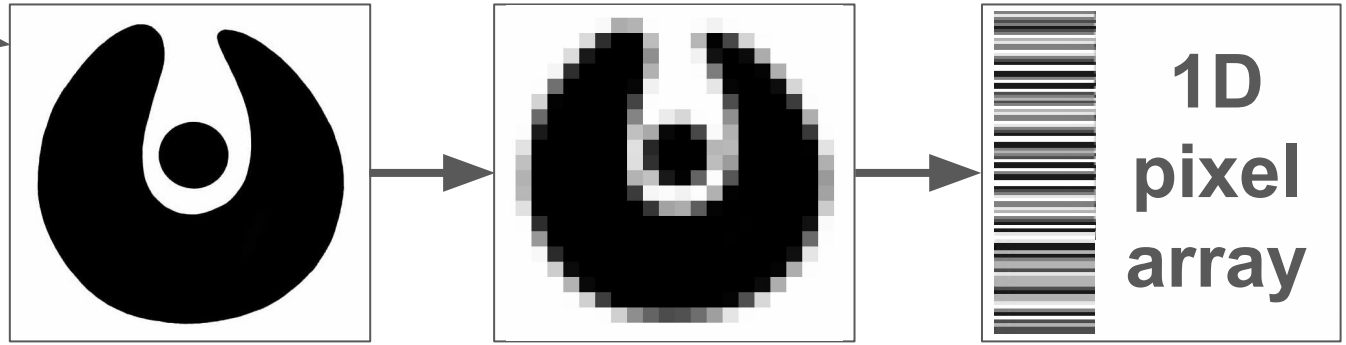
Label it using the survey in our apps

1/10	5/10	6/10	9/10	2/10	4/10	7/10	2/10	9/10	5/10	4/10	3/10	8/10	1/10	7/10

Recall: How to build a neural network

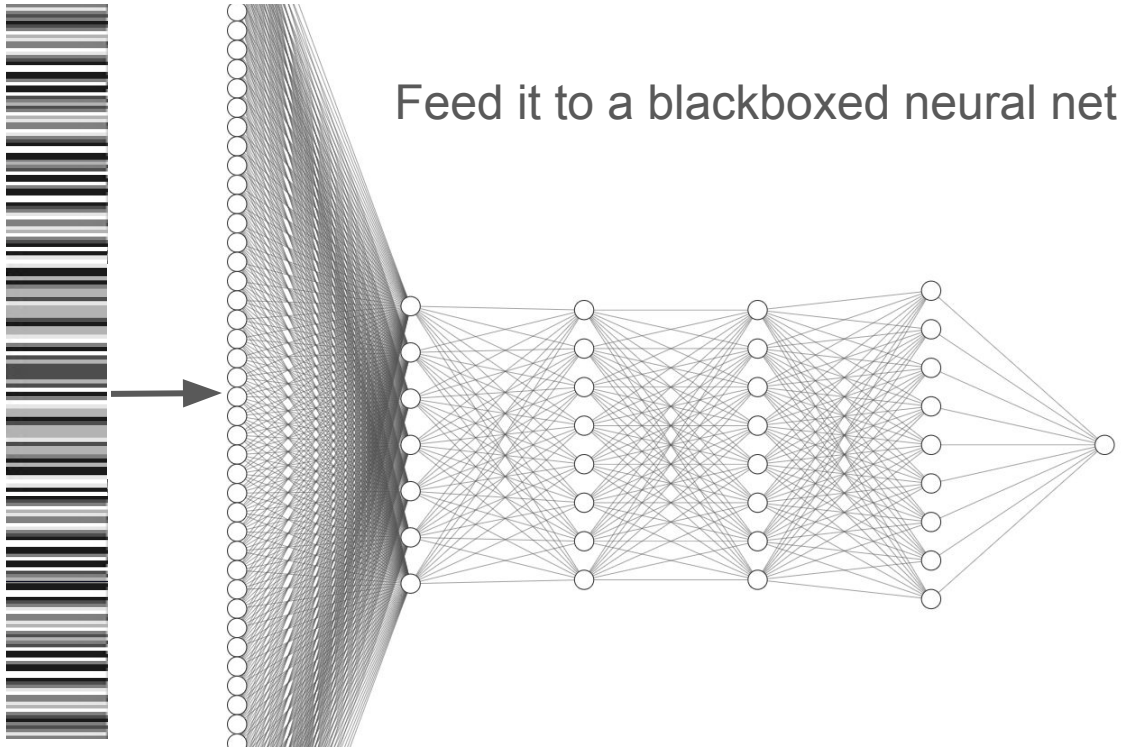


Convert each image to a set of pixels (pretraining)



Recall: How to build a neural network

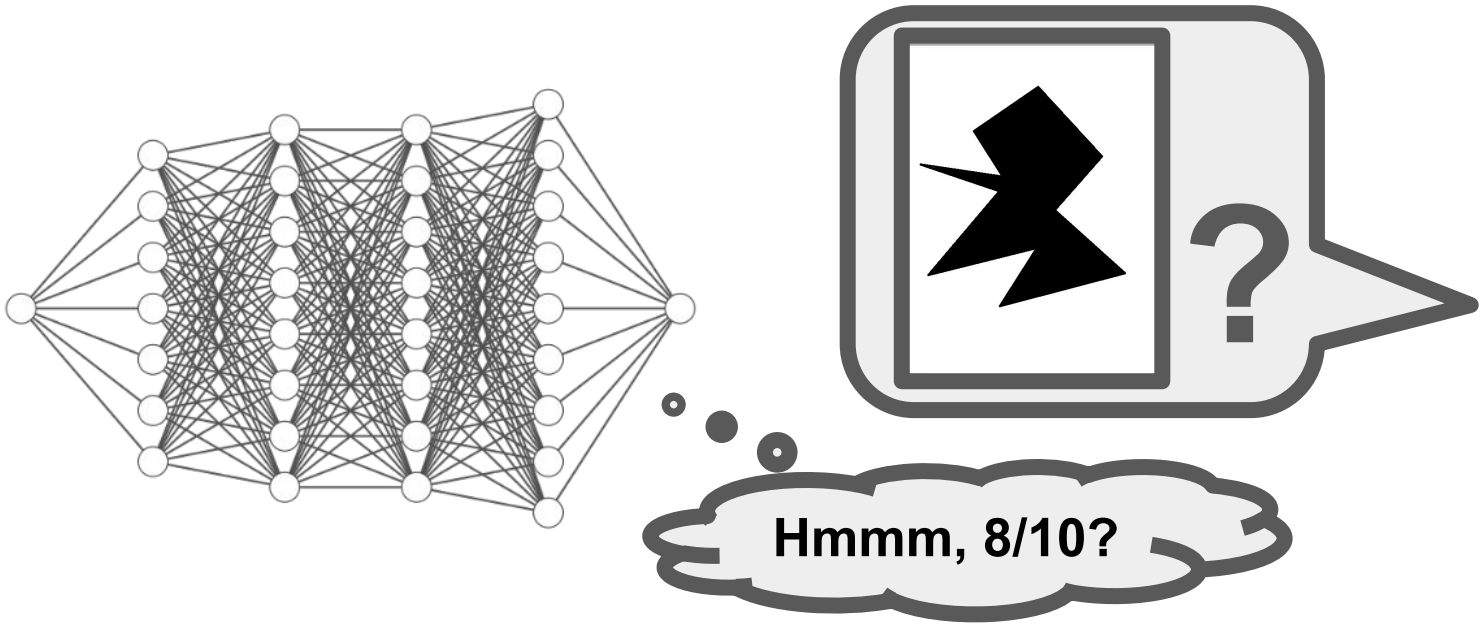
1D pixel array



Feed it to a blackboxed neural net

Recall: How a neural network works

And just like that we have a neural network that can make an educated guess as to how aesthetically pleasing an image is



Performance of image comparison

How do we measure performance?

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We implement a Train/Test split in our data

Train test split:

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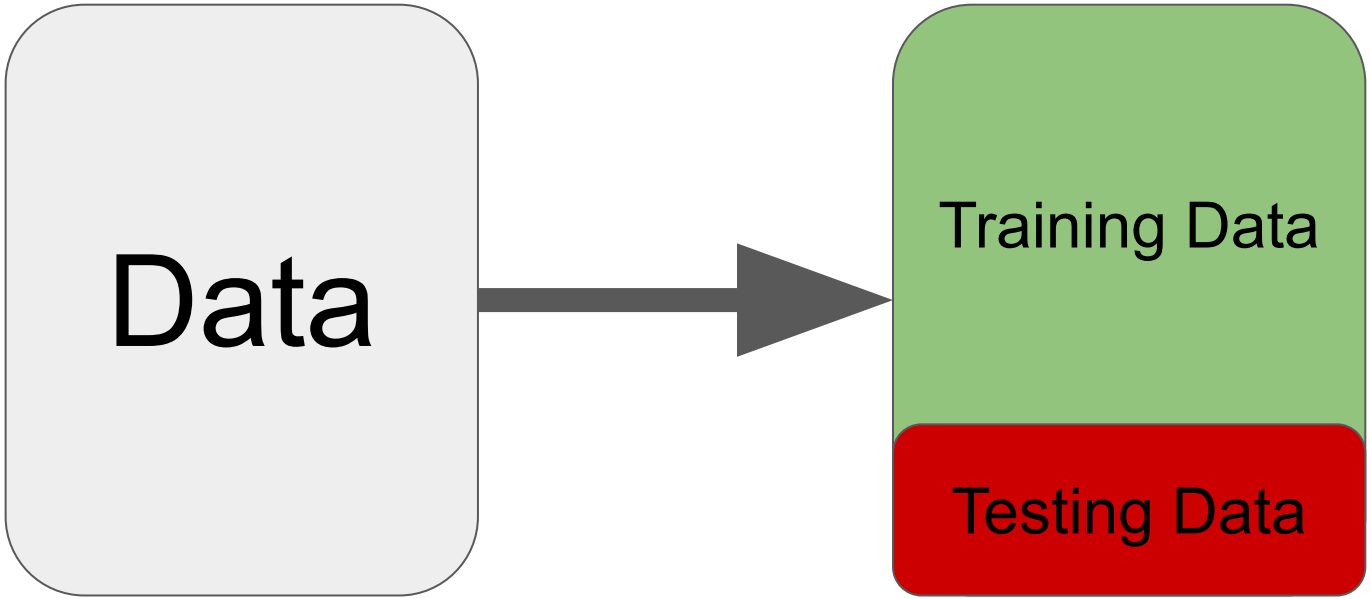
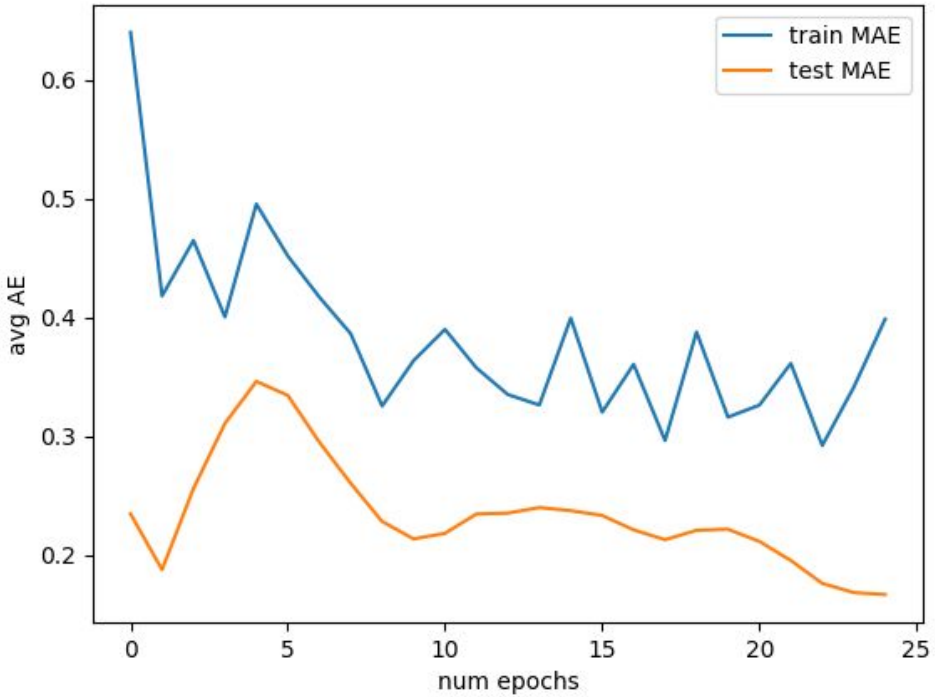


Train test split:



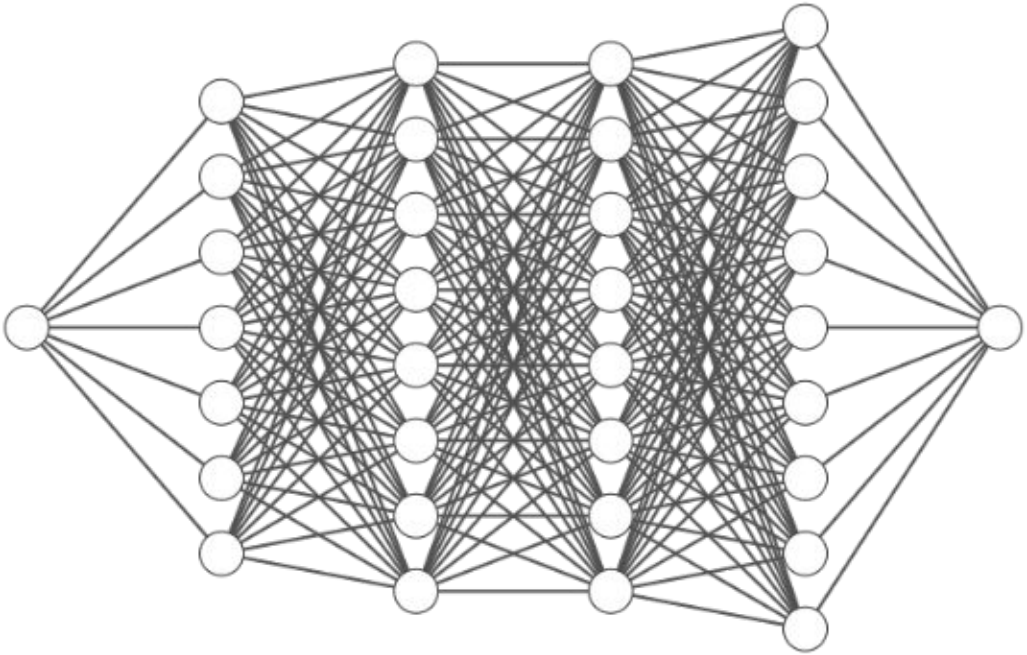
So Ultimately:

Our algorithm had an average error of 20% while trying to guess which image out of a pair was preferred by the majority of users (while guessing would be 50% +/-)

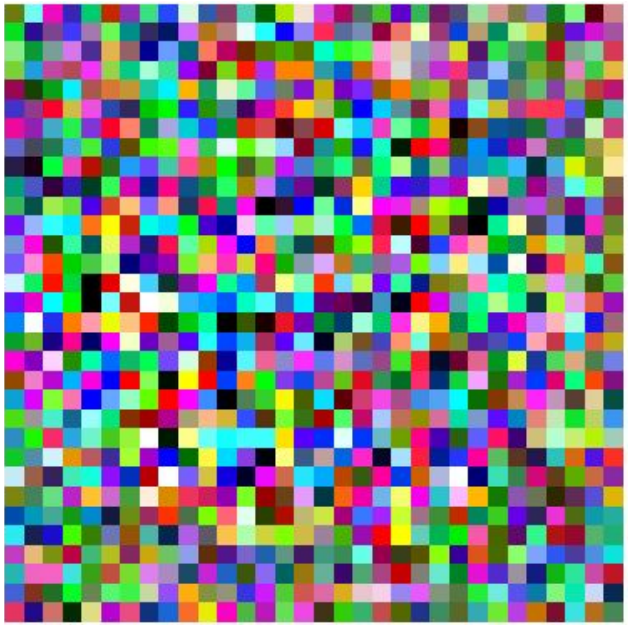
Meaning: for every 10 images, the Algorithm would align with the majority opinion for 8 of them (while guessing would have gotten 5 of them)

Algorithm used to generate images

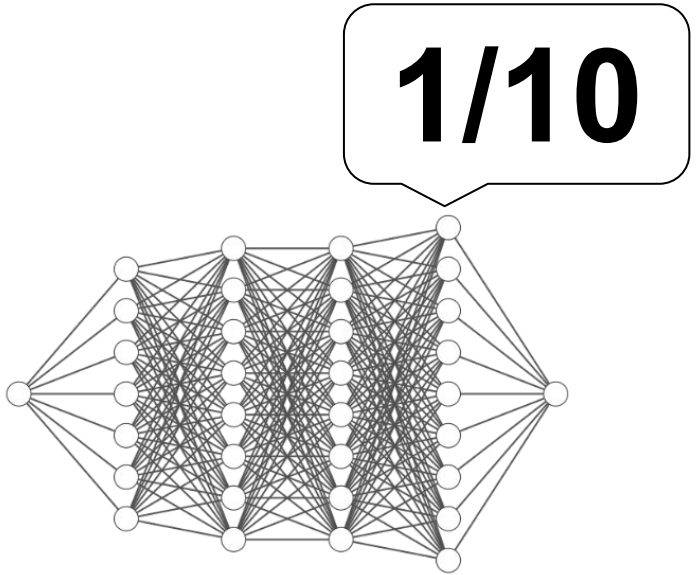
Starting out with our algorithm from earlier

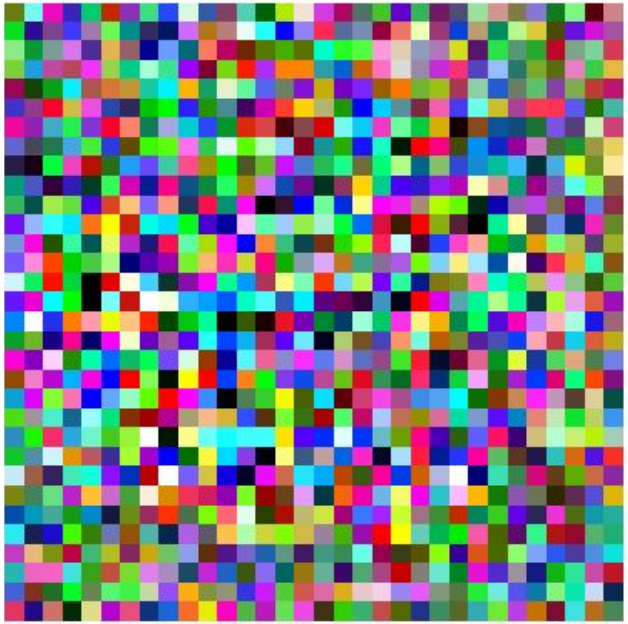


We generate an image from statistical noise

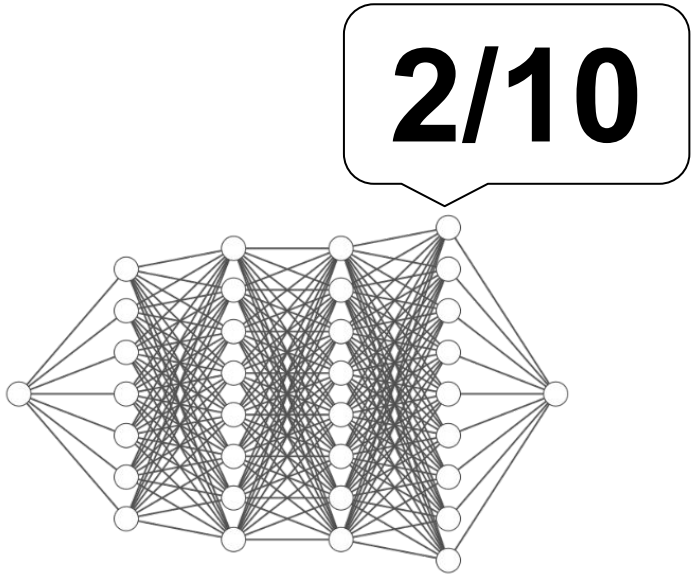


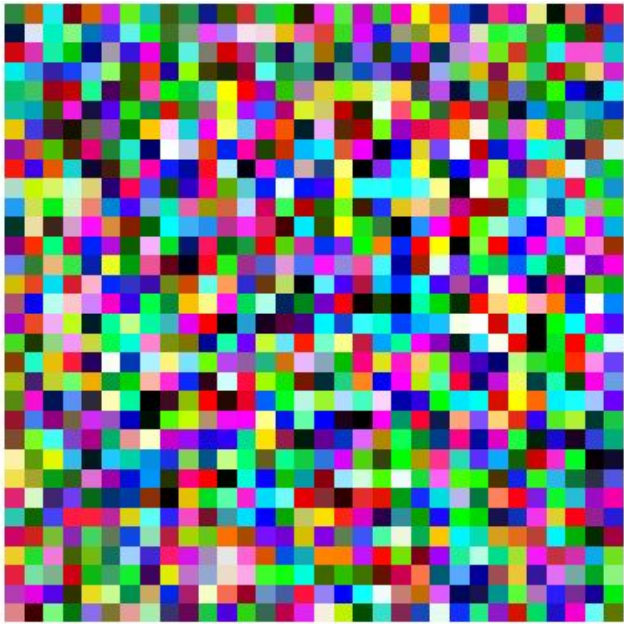
& ask our model what it thinks



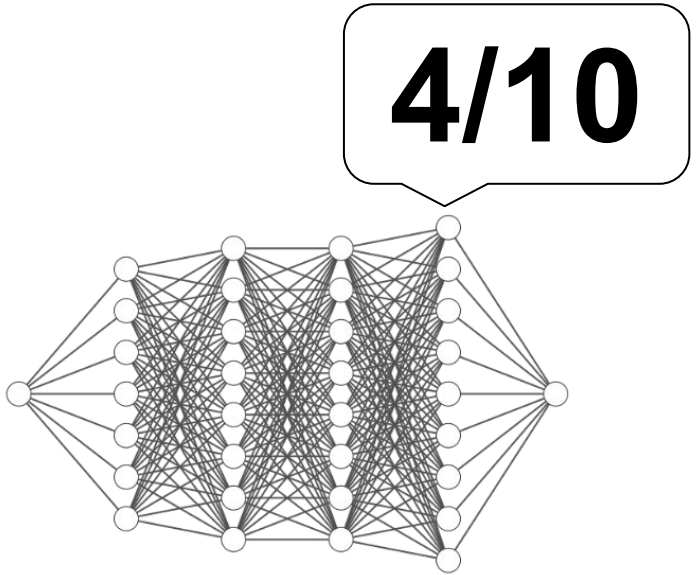


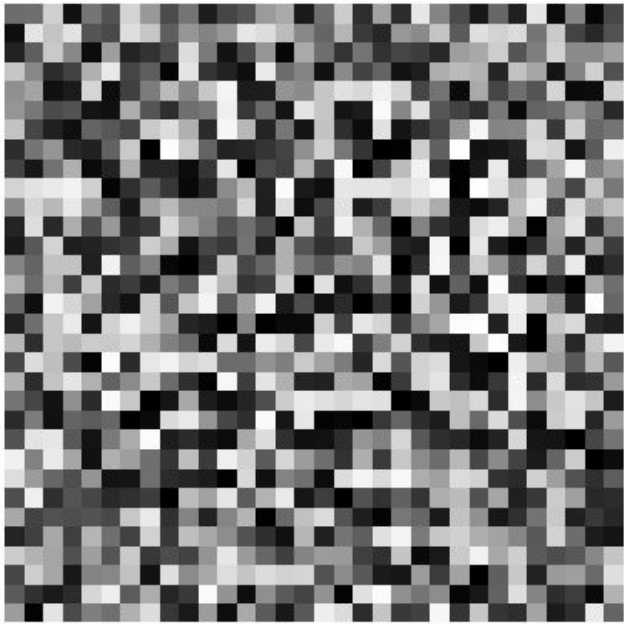
Using that we can generate a better image

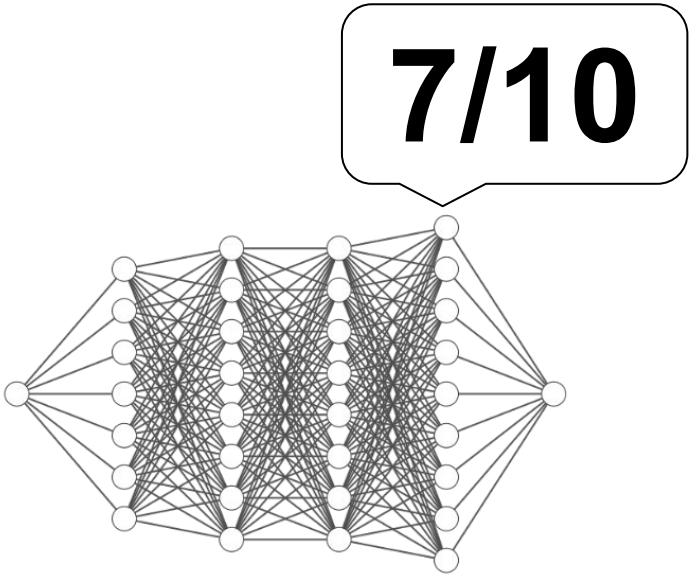


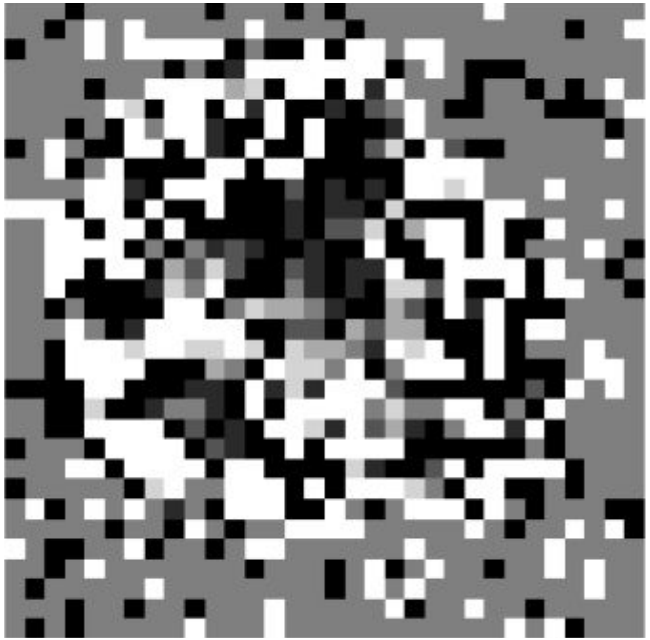


& then an even better image

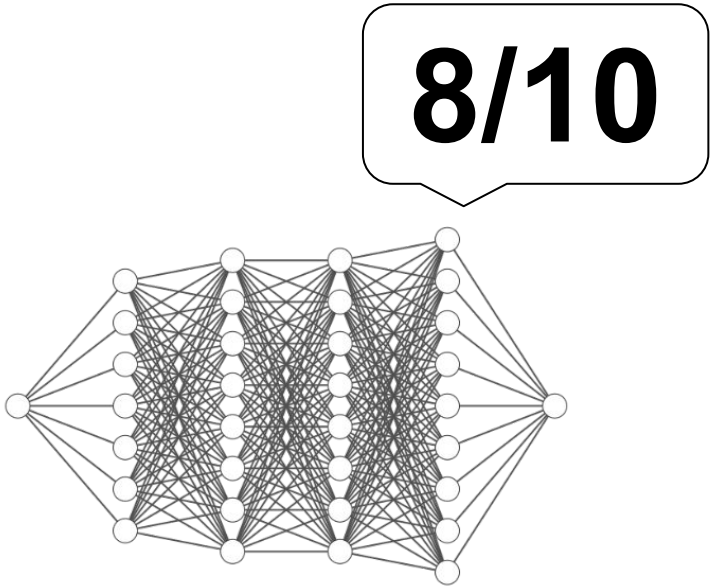


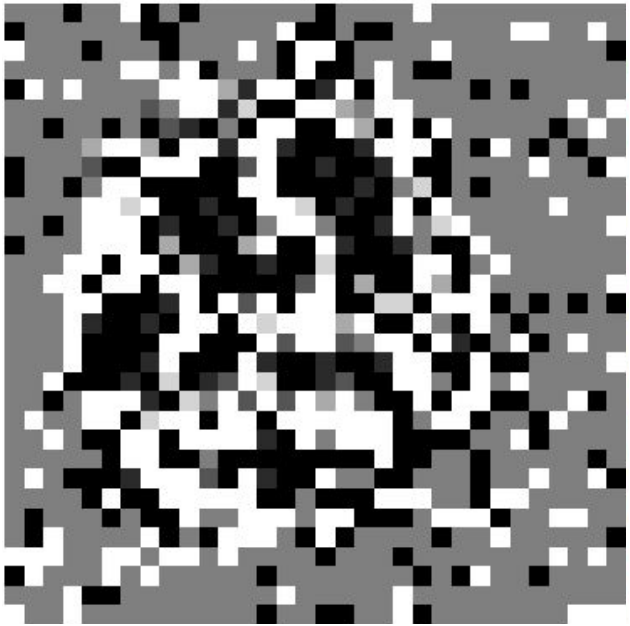



7/10



& then an even better image





Then finally we can smooth to create a final product

Smoothing aims to take a set of raw math output,
& interprets it into an image:

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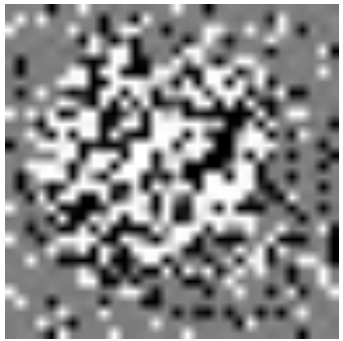
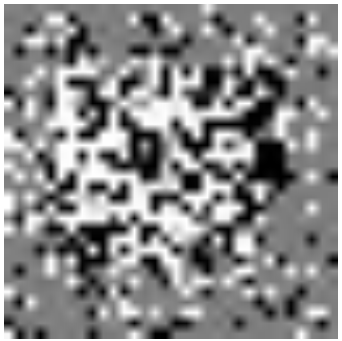
Our generated images ended up looking like this raw:





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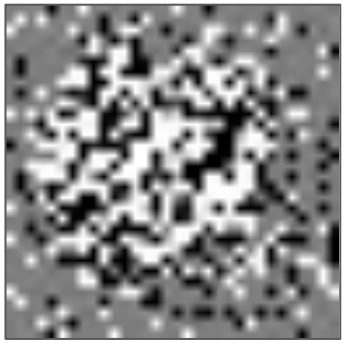
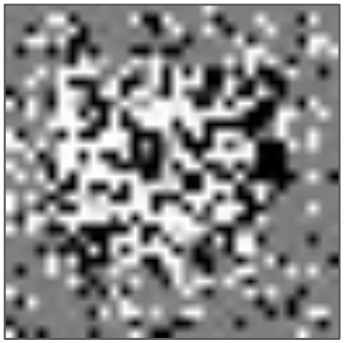
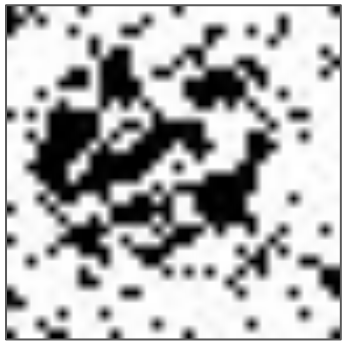
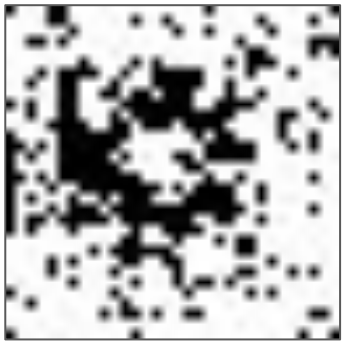
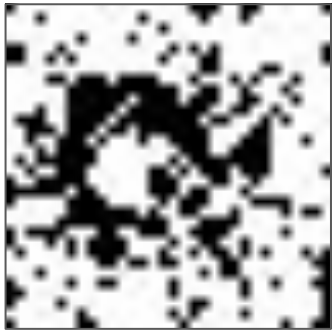




And like this after applying 4 Nearest Neighbor smoothing once:

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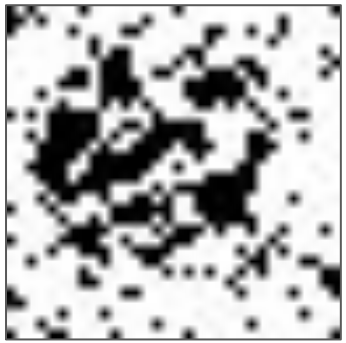
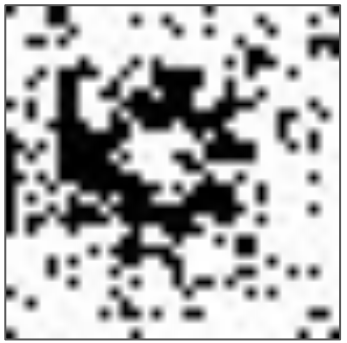
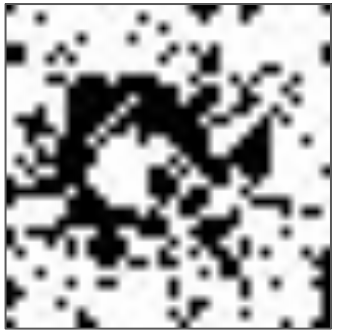




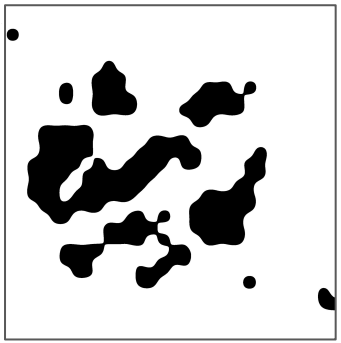
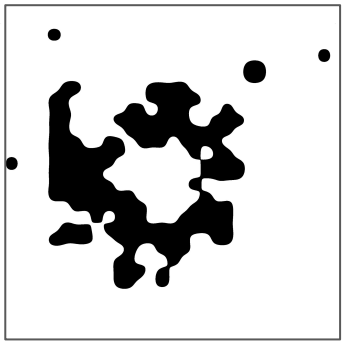
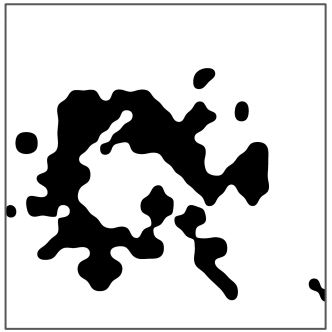
Then like this after applying Smoothing again:



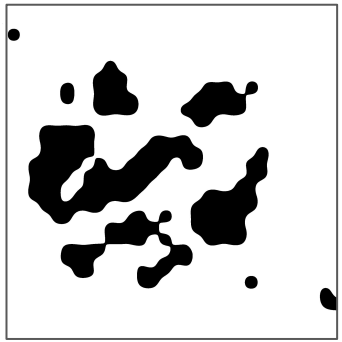
Then like this after applying Smoothing again:



Then like this after using interpolation to make HD versions:

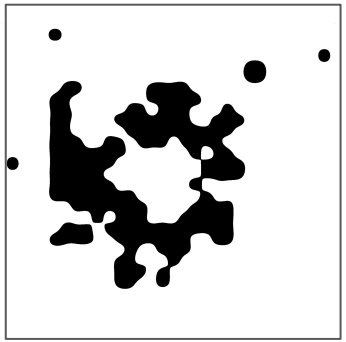




And rated by 5 people on a scale from 1-10:



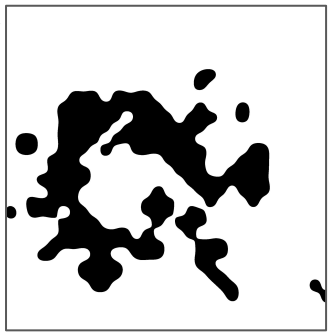
(9+8+10+7+9)/5

= 8.6/10



(7+8+9+8+7)/5

= 7.8/10



(6+8+9+5+8)/5

= 7.2/10

Therefore: the algorithms in place can make adequate but non excellent images - this serves as a proof of concept that with a sufficient pool of data a successful algorithm can generate images en mass

A note on small sample size

Thanks for listening

A note on dovetailing:

Some elements in this slideshow are copied from team member Samira Almuallim’s work in the client information session 3 & the M3 slides