I <3 Algorithms!

Welcome to you print-at-home version of the I Love Algorithms card deck. Simply print at home (color is best!) and cut out the cards to begin playing with algorithms. This deck can be used as-is, on its own, or go to https://dschool.stanford.edu/emerging-tech to pair with other tools we’re building.

I <3 Algorithms!

I love...what?
An algorithm is a piece of code that helps process, manipulate, or investigate a data set. There are many types of algorithms used in machine learning. Machine learning is a way of analyzing big data sets where the computer learns and gets better at its analysis with time.

This card deck describes six different machine learning algorithms. Since humans all learn differently, we show each algorithm in three ways: (1) text description, (2) cartoon, and (3) types of questions you might be asking yourself.

I <3 Algorithms!

Can my love run deeper than these six algorithms?
Of course. This deck includes the basic types of machine learning algorithms, but there are many ways to expand on this content in future versions.

One concept we have not covered here is deep learning. Deep learning is a type of machine learning where the computer learns what to do without being explicitly programmed to do so. It is the gateway to things like speech and image recognition, analysis of text, and much more. Neat!

I <3 Algorithms!

So...why do I need to know anything about algorithms?
In order for the technologies of today and tomorrow (and all of the things that they power) to represent all of us, they need to be built by all of us. You don’t need to be the coder, but you need to know what the code can do.

If you understand what machine learning algorithms can do, you can better envision the implications of your designs. You can influence conversations about data and bias.

I <3 Algorithms!

We hope you love this deck as much as you love algorithms!
This is the work of the Stanford d.school. The d.school helps people develop their creative abilities. It’s a place, a community, and a mindset. As designers and educators, we believe in providing radical access to the intersection of technology and design.

Spread the love...
Please use this deck, share it, and credit us. We would like to know how you use it. For more info visit dschool.stanford.edu.
**Dimensionality Reduction**

Reduces the number of variables in a data set but keeps the important stuff. Good for raw data sets where a lot of features might be redundant or irrelevant. Helps see the forest through the trees. You give it the data but the machine figures out how to clean it up.

**Reinforcement Learning**

Put your machine into an environment and give it a goal. It begins to interact and uses trial and error to figure out what to do. It wants to win more than anything. Useful in robotics. Useful for figuring out ideal behavior in a given situation in order to maximize performance.

**Regression**

For finding cause and effect between different variables. Useful for forecasting (like the weather) or for things where historical data helps predict the future. Regression is your trend-finder. Feed it the data and example answers. It compares its answers with the right ones to get better.
This algorithm predicts what category something might land in. You (the human) supervise it. You give it the data and you tell it what categories to pick from. It can compare its answers with the right ones and get better.

Groups similar things together. Makes groups where objects in one group are more similar to each other than to a different group. You give this the data, but the machine figures out how it’s related.

Are certain things likely to happen together? The algorithm finds hidden relationships. You give it the data, but the machine figures out how it’s related.

Is this a picture of hot dogs or legs?

Does this x-ray indicate the patient has pneumonia?

Is that a noun or a verb or an adjective?

Am I in the car lane or the bike lane?

I need to market these ripped jeans, are there certain types of groups that I should target specifically?

How are the the world’s consumers of kombucha related? What are the sub-segments?

If someone buys a donut, are they 99% likely to also get a coffee?

If someone listens to Queen and Kanye are they 65% likely to also listen to Funkadelic?
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Classification

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Association

Are certain things likely to happen together? The algorithm finds hidden relationships. You give it the data, but the machine figures out how it’s related.

Clustering

Groups similar things together. Makes groups where objects in one group are more similar to each other than to a different group. You give this the data, but the machine figures out how it’s related.

Association

Do you have this type of question...
If someone buys a donut, are they 99% likely to also get a coffee? If someone listens to Queen and Kanye are they 65% likely to also listen to Funkadelic?

Clustering

Are you wondering things like...
I need to market these ripped jeans, are there certain types of groups that I should target specifically? How are the world’s consumers of kombucha related? What are the sub-segments?

Classification

Is this a picture of hot dogs or legs?
Does this x-ray indicate the patient has pneumonia?
Is that a noun or a verb or an adjective?
Am I in the car lane or the bike lane?