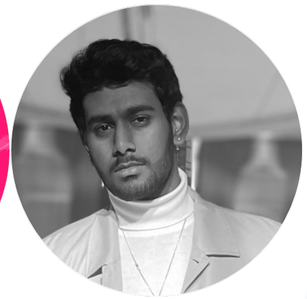
Demystifying Image Recognition – Deep Learning

Fundamentals of Image Processing Using Deep Learning



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@asaravanan

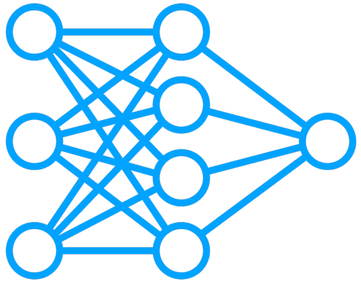
Course Layout

Explore neural networks for image recognition

Convolutional neural networks (CNN)

Image processing in the real world

Starting our own image recognition problem



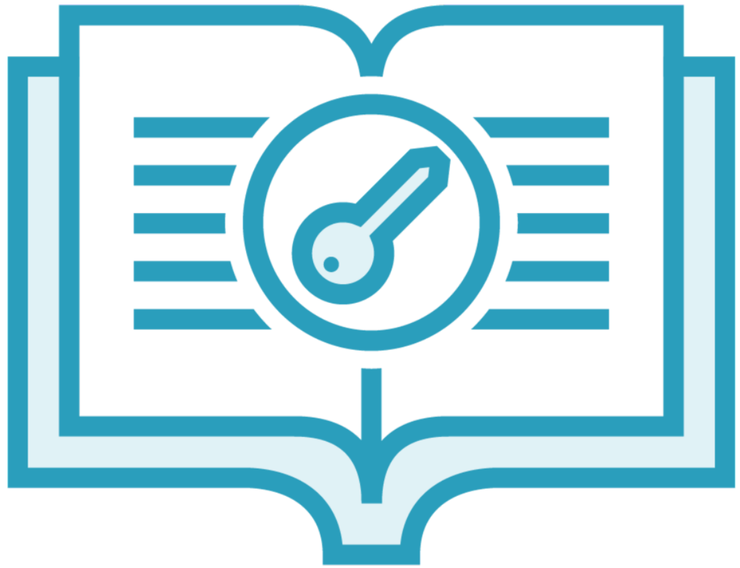
Create our own CNN

Implement transfer learning

Comparing and analyzing accuracies

Next Steps

Prerequisites

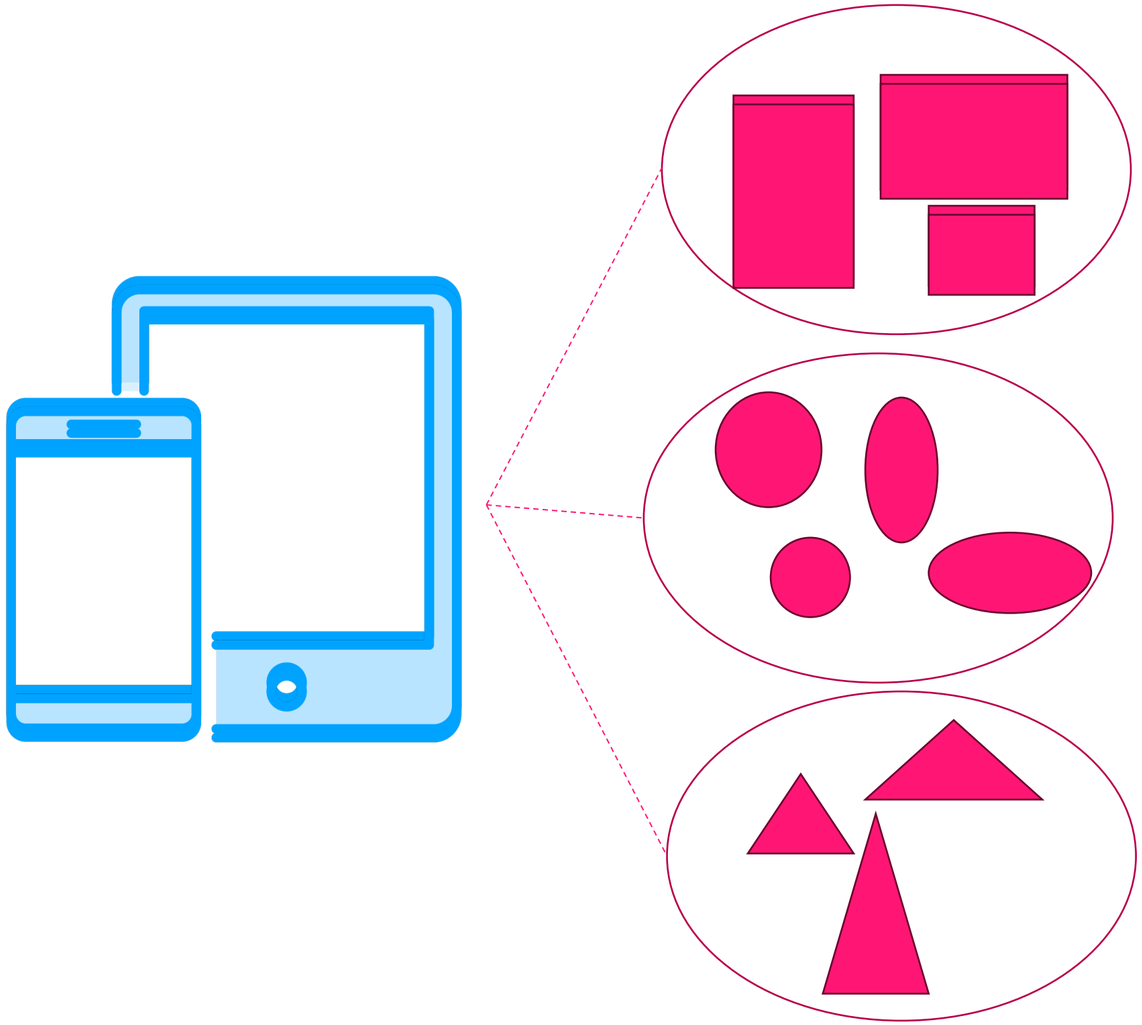


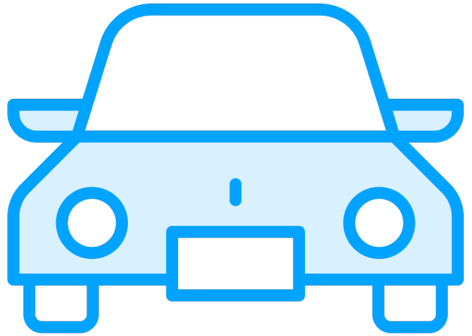
Python 3.12

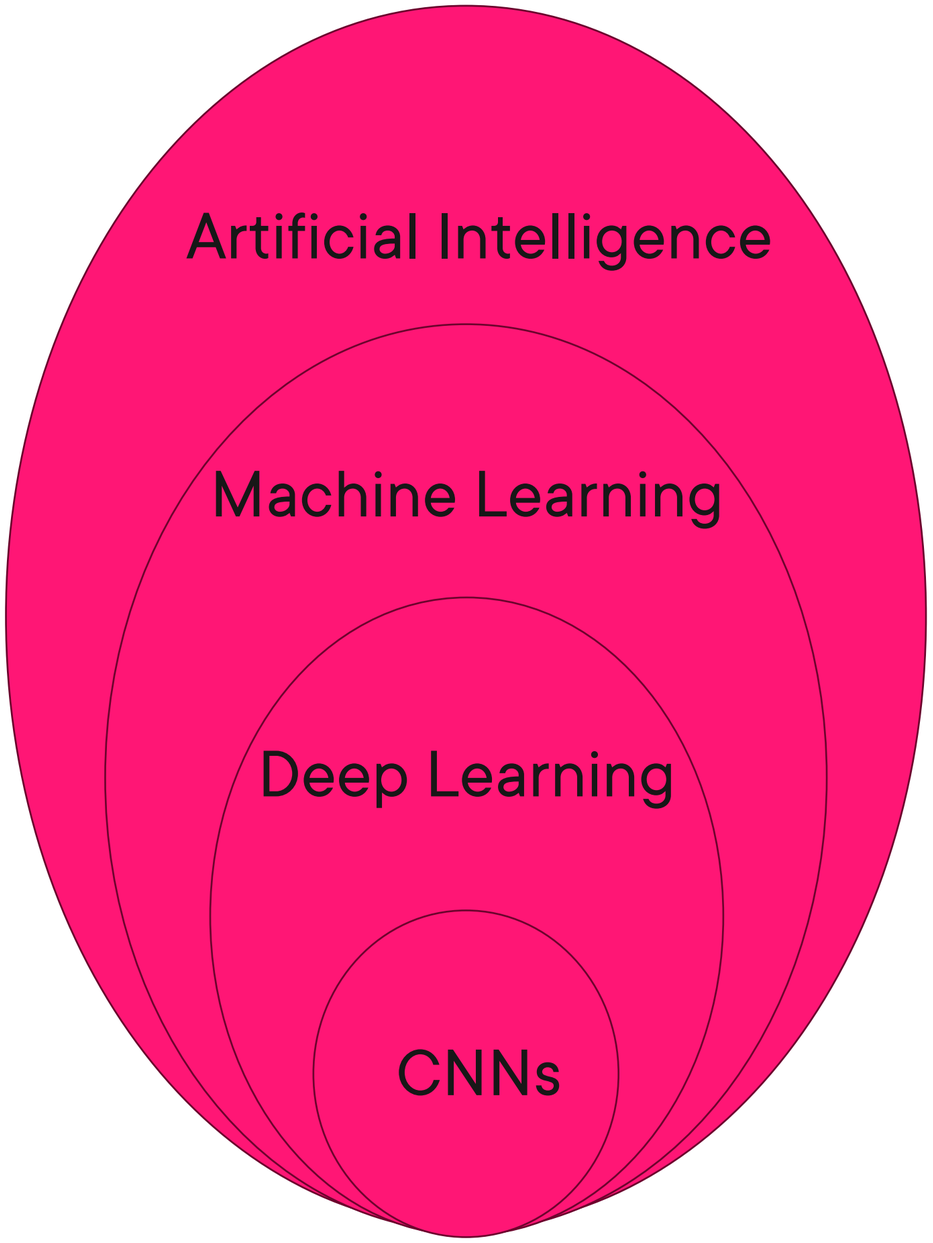
Google Colab

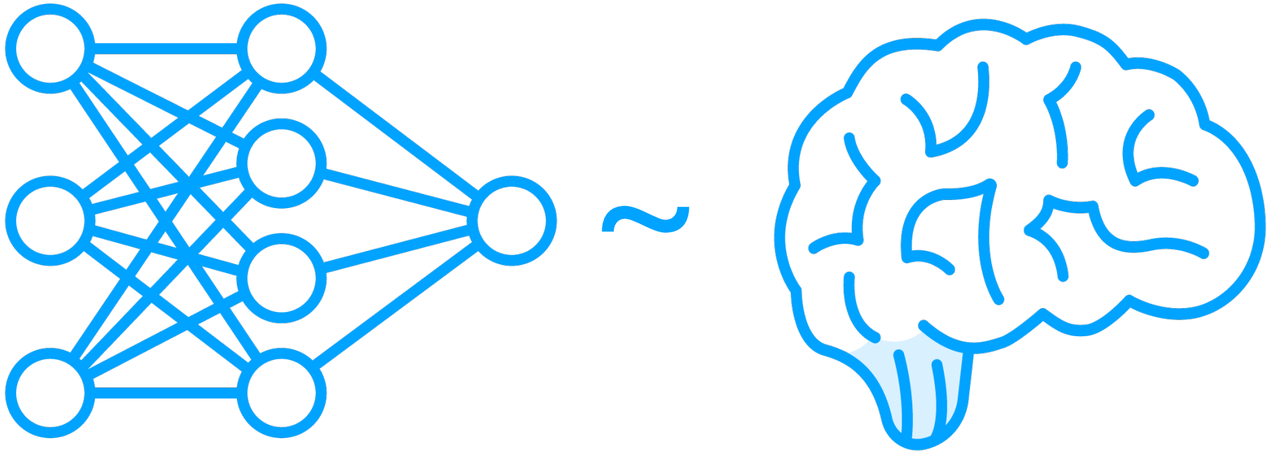
Basics of neural networks

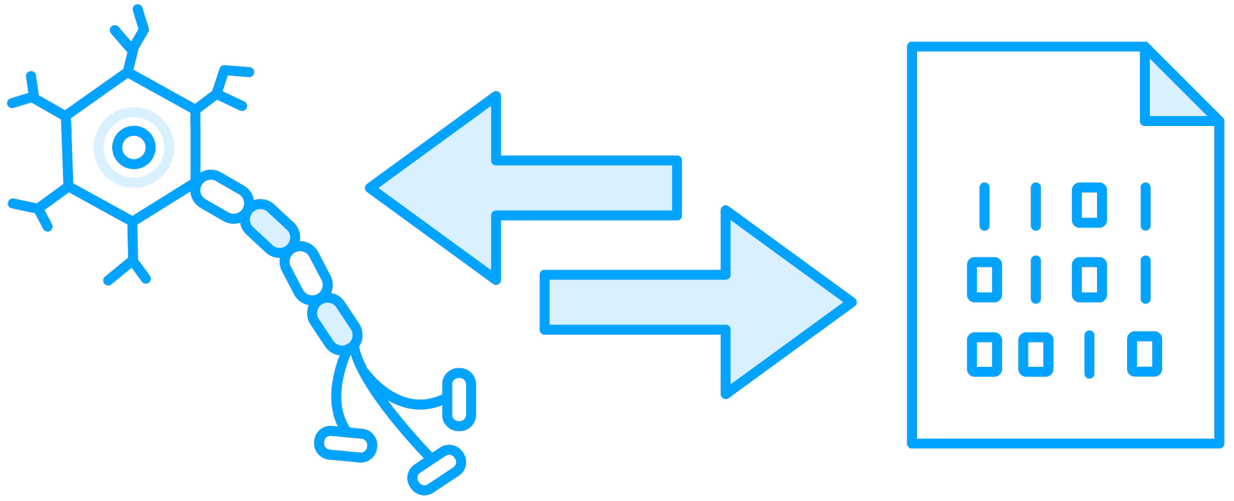
Fundamentals of machine learning



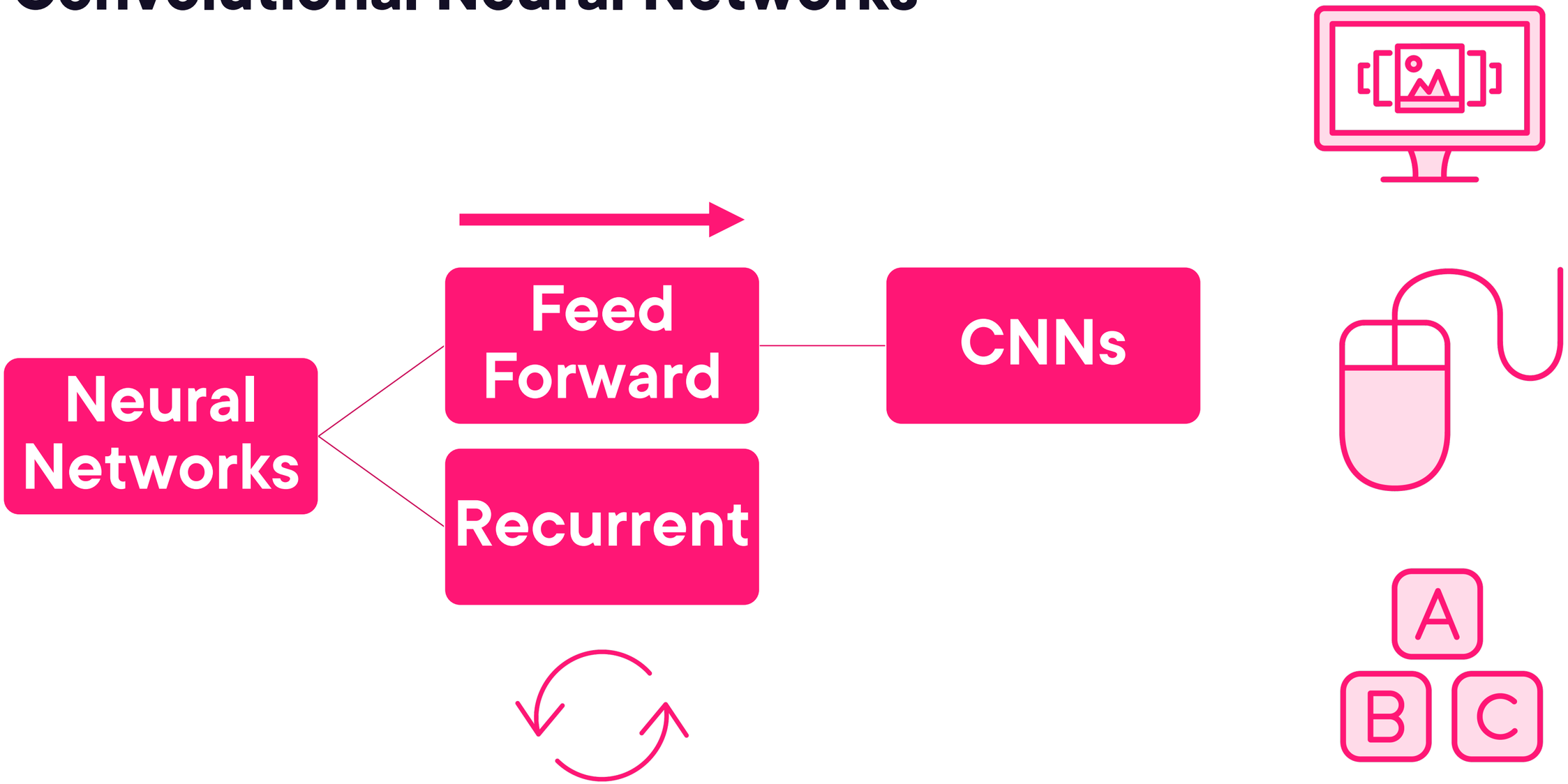



Artificial Intelligence
Machine Learning
Deep Learning
CNNs





Convolutional Neural Networks



“Convolutional neural networks are distinguished from other neural networks by their superior performance with image inputs. They have three main type of layers – convolutional, pooling, and fully-connected.”

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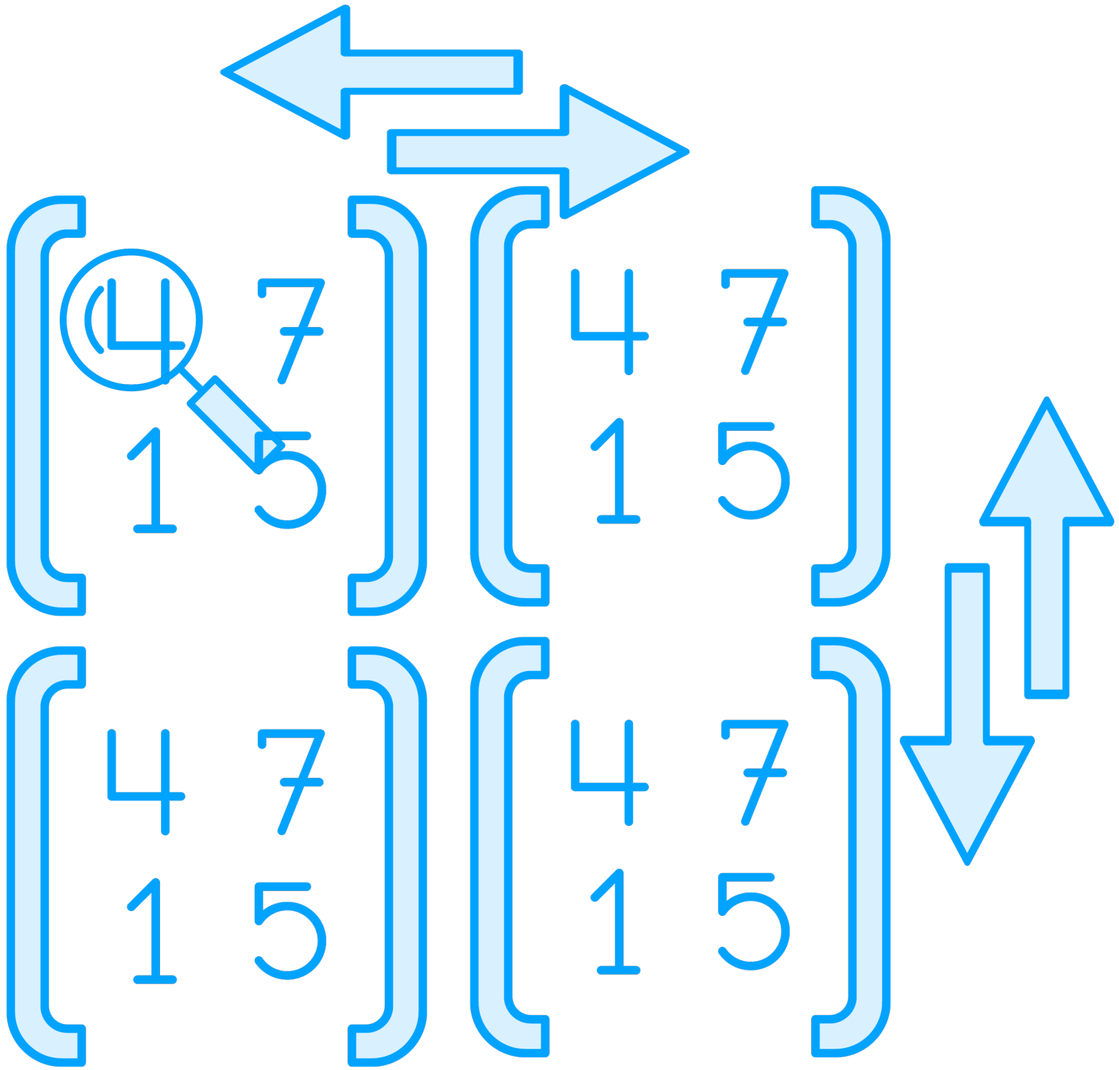
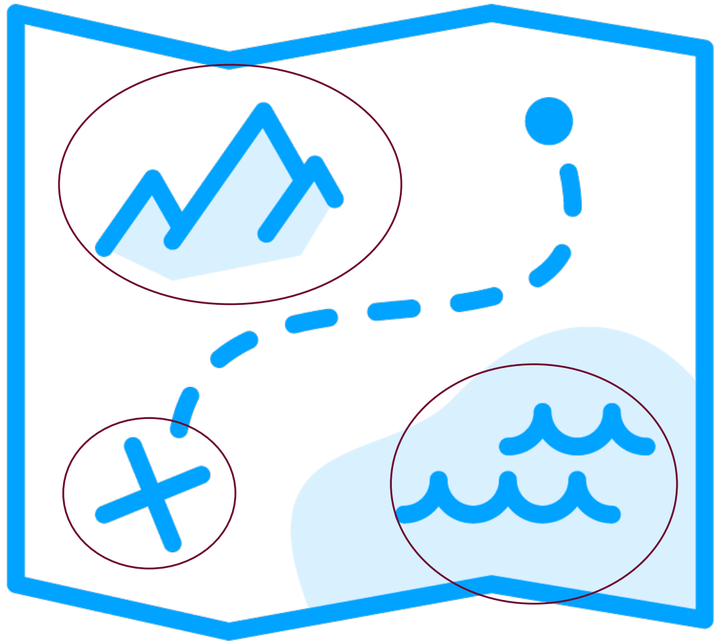
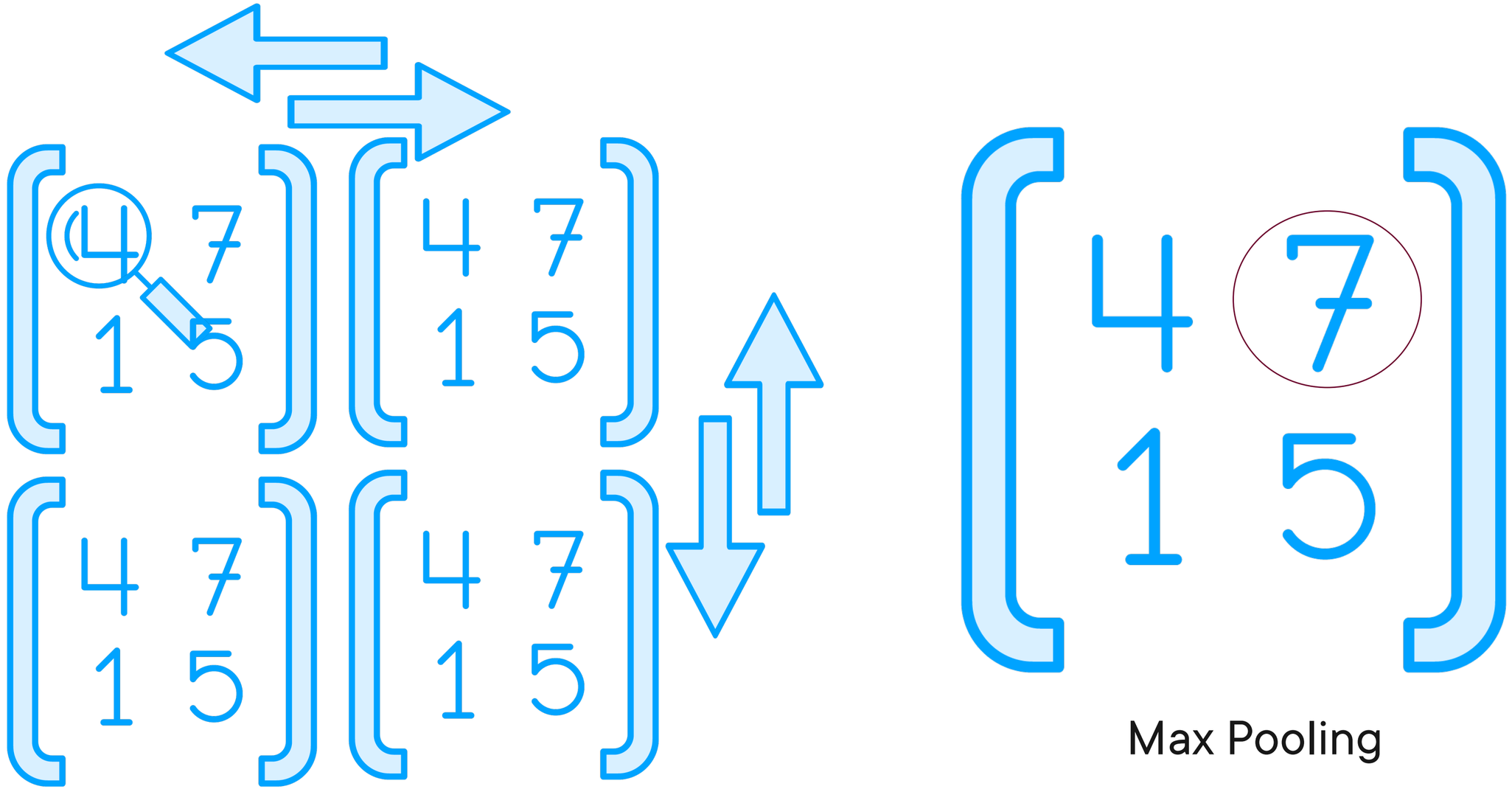
https://www.ibm.com/topics/convolutional-neural-networks#:~:text=Convolutional%20neural%20networks%20are%20distinguished,Pooling%20layer

Convolutional Layer

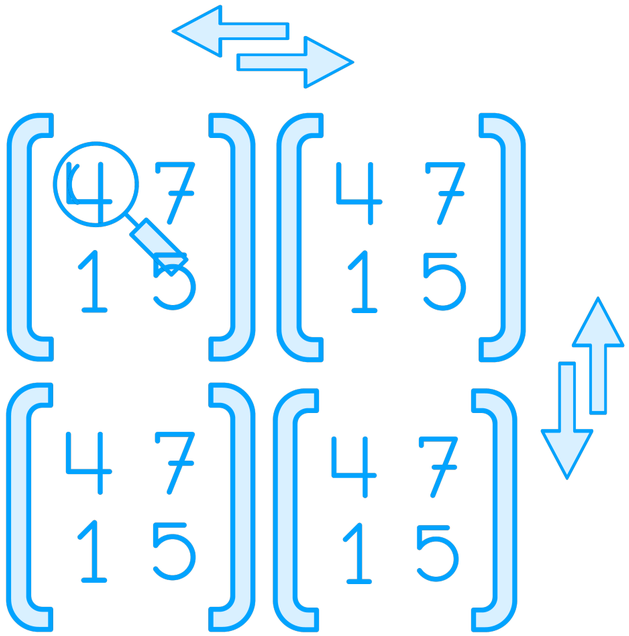




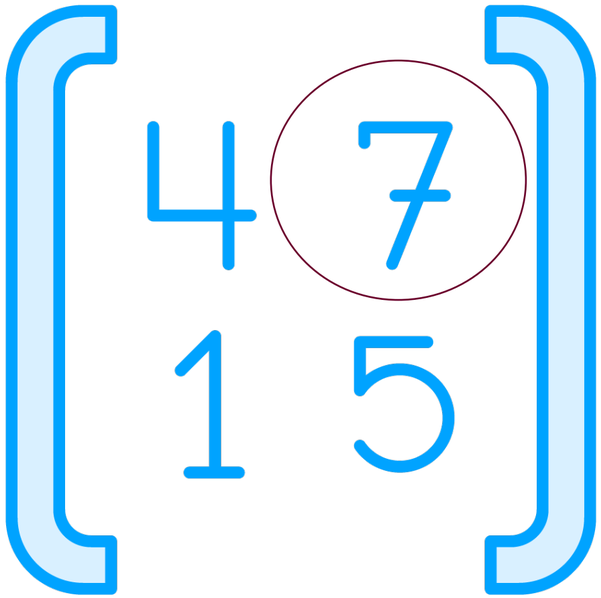
Pooling Layer



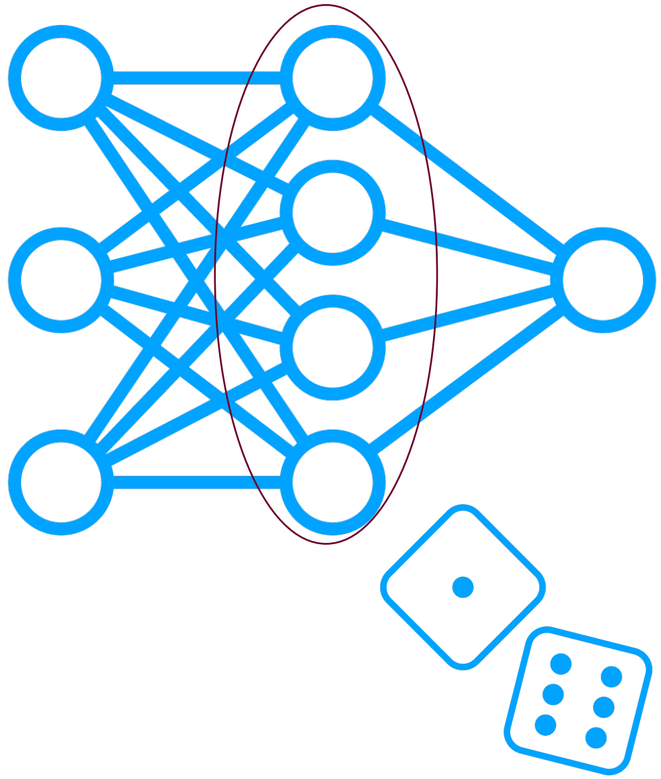
Fully Connected Layer



Convolutional layer

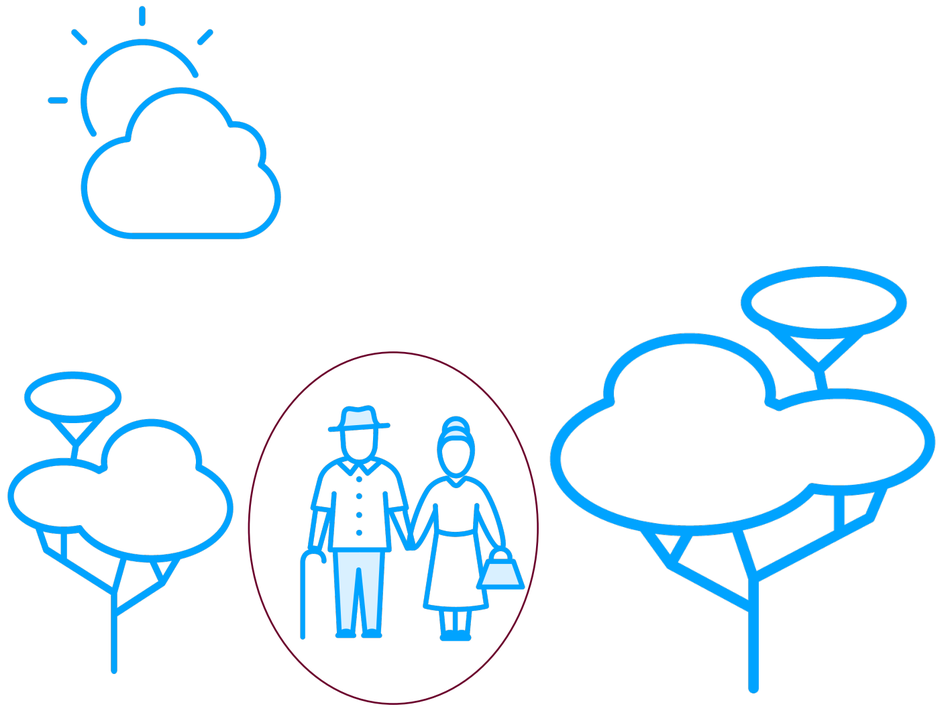


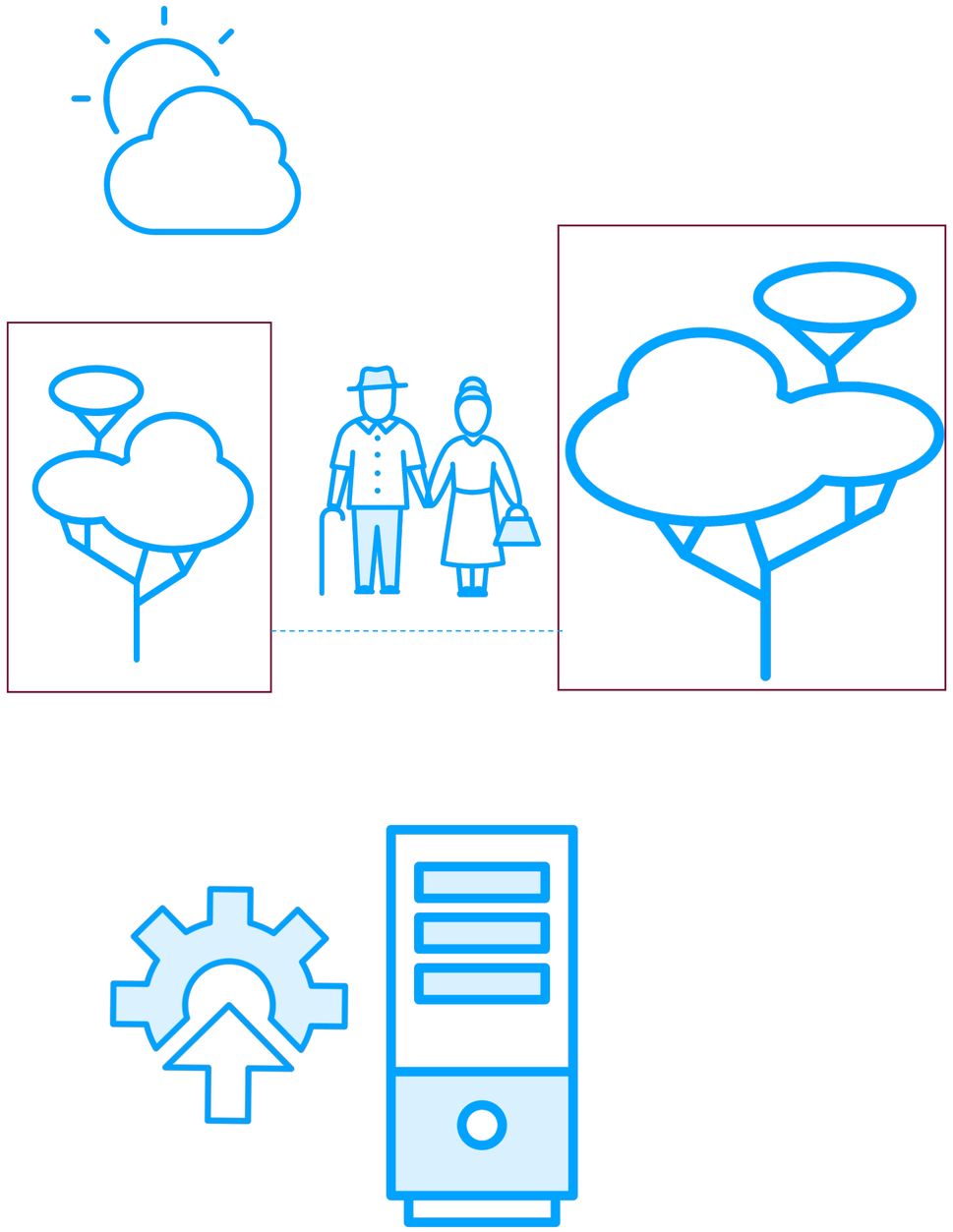
Pooling layer



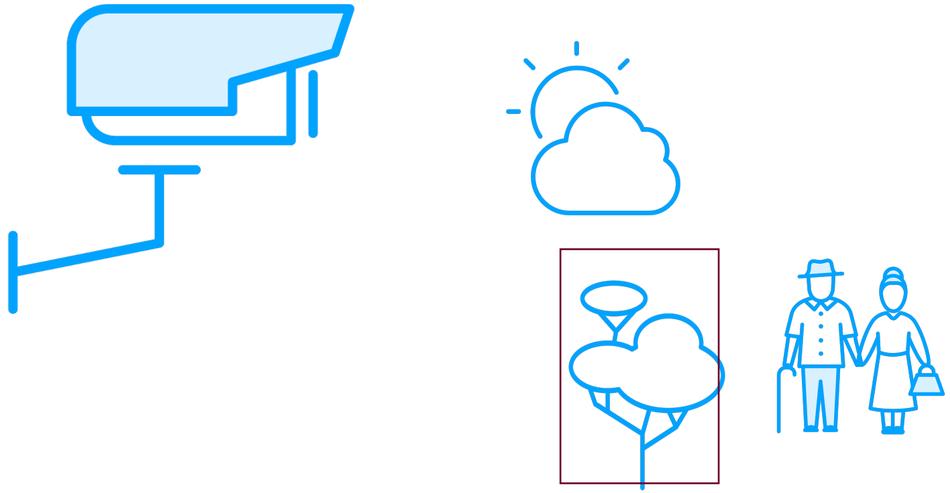
FC layer

Variations of CNNs

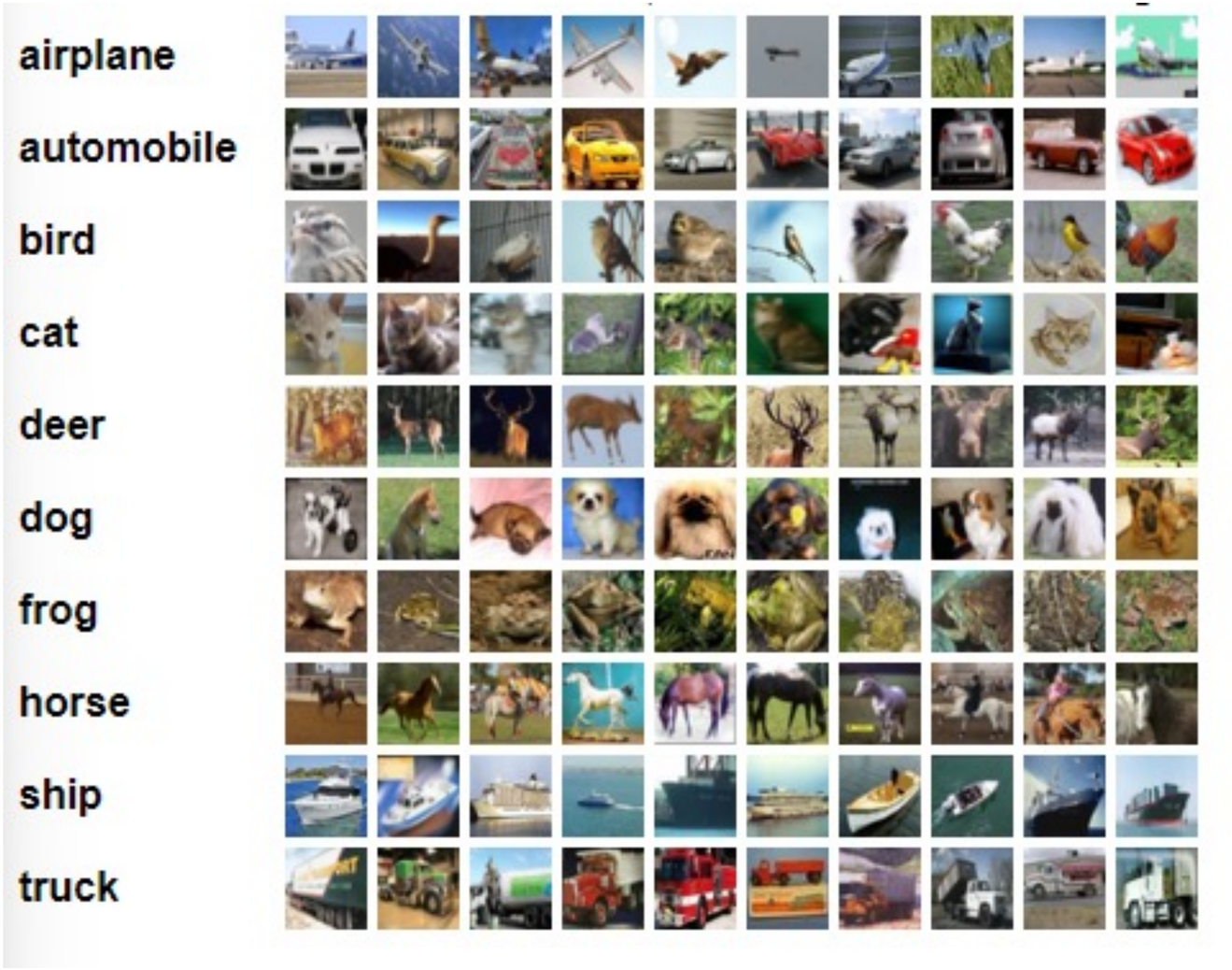




Real World Examples



CIFAR-10



https://www.cs.toronto.edu/~kriz/cifar.html

Set up our own Image Processing Problem

Summary

Learned about the mechanics behind CNNs and how they can process images

Discovered various real-world applications of object recognition and detection

Learned a few different variations of CNNs such as YOLO, Faster R-CNN, etc.

Started working on our own image recognition problem