# Last Words



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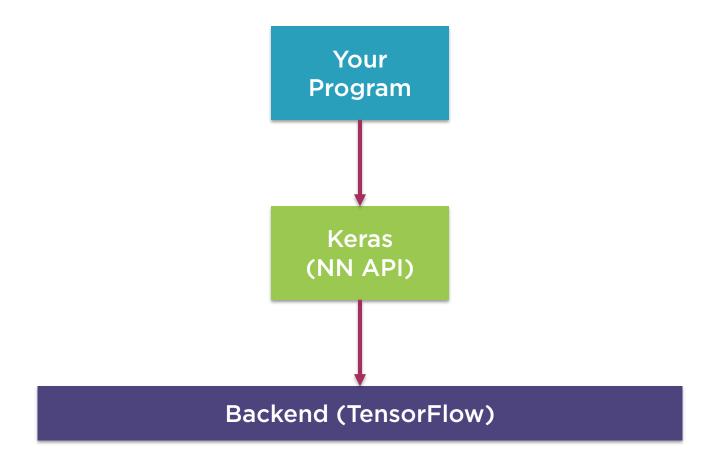


## Keras

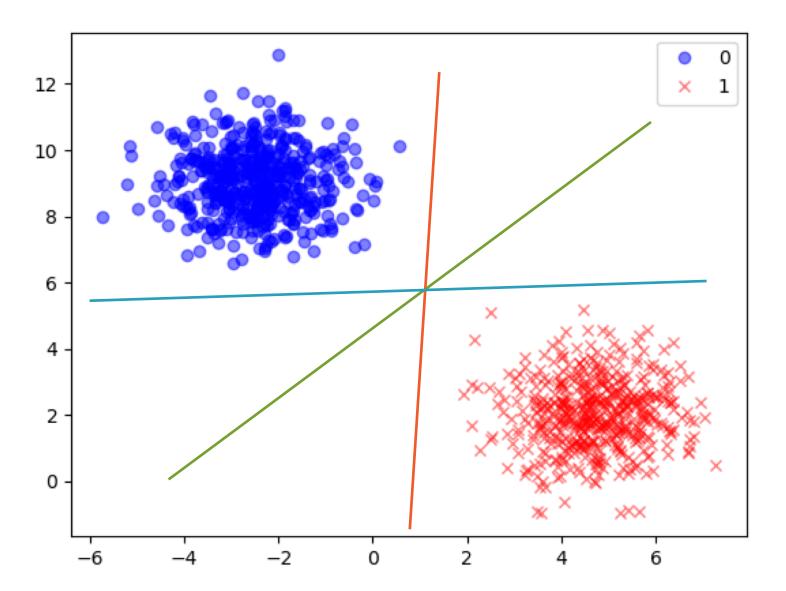
Keras is a high-level neural network API, written in Python and capable of running on top of TensorFlow, CNTK, or Theano.



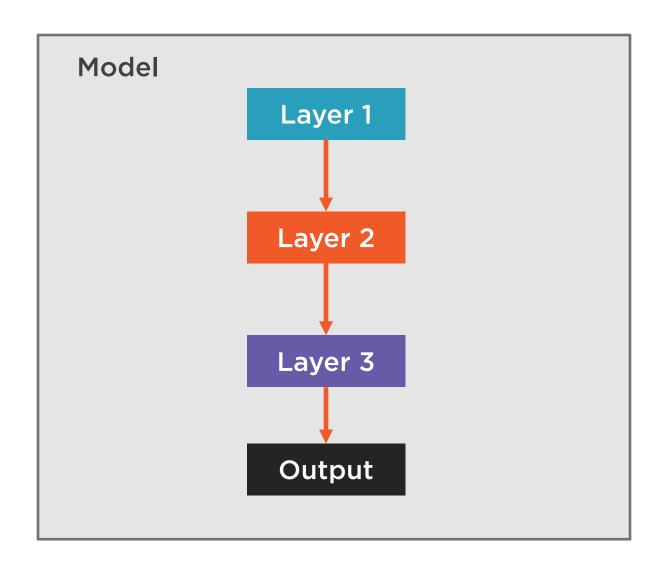
### Keras Environment





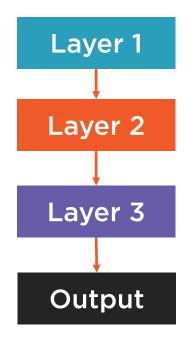


# Keras Model and Layers

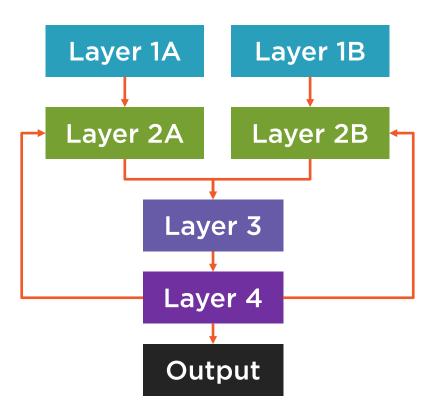


### Keras Models

### Sequential

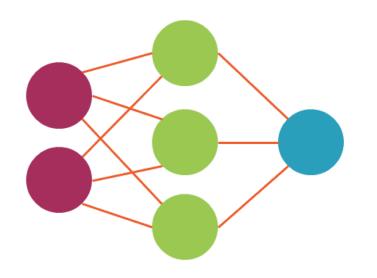


#### **Functional API**



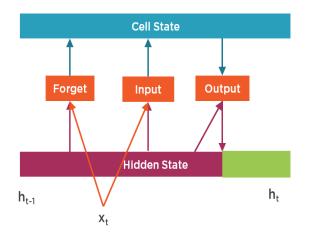


# Layers



O <sub>x1</sub>	1 x0	1 x1	1	1	
0 x0	0 x0	0 x0	1	1	0
O x1	0 x0	1 x1	1	1	1
1	0	0	1	1	1
1	1	0	0	``]``	1
0	0	1	1	0	0

	2	3	4	4			
	1	2	2	3			
	3	2	3	3			
	2	2	3	3			





# Layers and Functions

**Specialty** Custom **Pre-processing** Layers Layers



## Learning References

#### Keras

```
Keras - <a href="https://keras.io/">https://keras.io/</a>
Keras Blog (Francois Chollet) - <a href="https://blog.keras.io/">https://blog.keras.io/</a>
```

#### **Deep Learning Book**

Deep Learning - Goodfellow, Bengio, and Courville - <a href="http://www.deeplearningbook.org/">http://www.deeplearningbook.org/</a>

#### Courses

Stanford CS231 - http://cs231n.github.io/convolutional-networks/



## Learning References (cont.)

### RNN/LSTM

Chris Olah - <a href="http://colah.github.io/posts/2015-08-Understanding-LSTMs/">http://colah.github.io/posts/2015-08-Understanding-LSTMs/</a>

#### **RNN Applications**

Andrej Karpathy - <a href="http://karpathy.github.io/2015/05/21/rnn-effectiveness/">http://karpathy.github.io/2015/05/21/rnn-effectiveness/</a>





