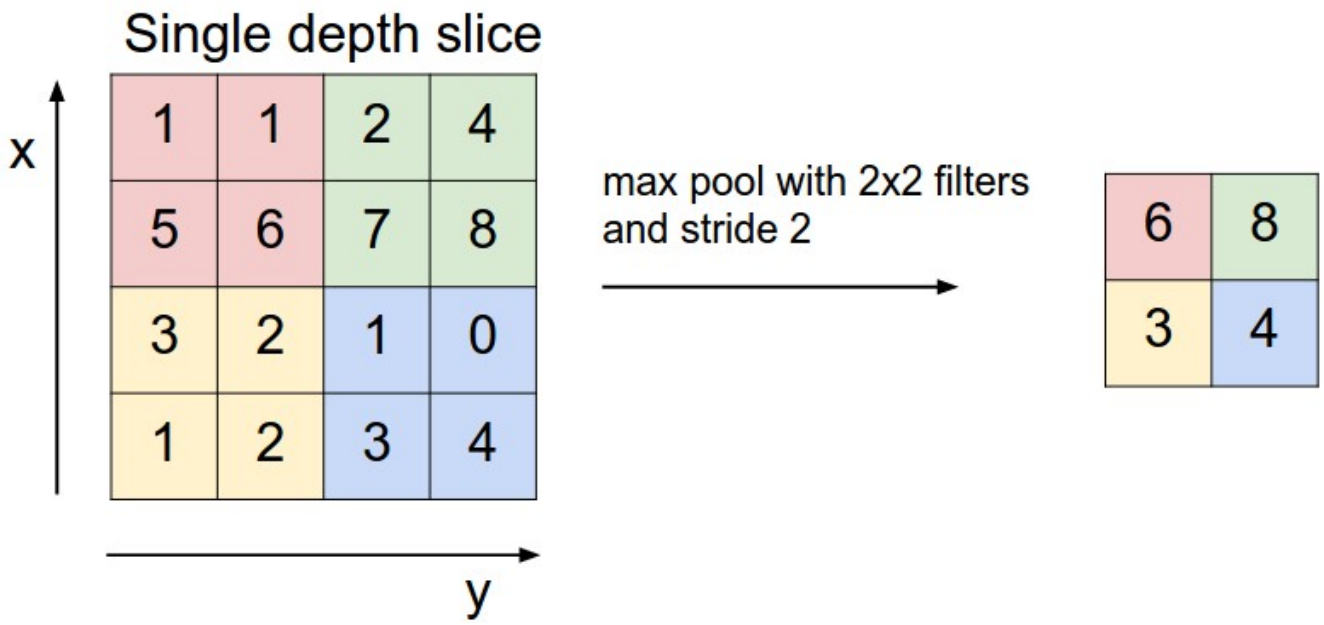

Max pooling with 2x2 window and stride 2

Image source: http://cs231n.github.io/convolutional-networks/

Max Pooling Layers in Keras

To create a max pooling layer in Keras, you must first import the necessary module:

```
from keras.layers import MaxPooling2D
```

Then, you can create a convolutional layer by using the following format:

```
MaxPooling2D(pool_size, strides, padding)
```

Arguments

You must include the following argument:

- `pool_size` - Number specifying the height and width of the pooling window.

There are some additional, optional arguments that you might like to tune:

- `padding` - One of `'valid'` or `'same'`. If you don't specify anything, `padding` is set to `'valid'`.

NOTE: It is possible to represent both `pool_size` and `strides` as either a number or a tuple.

You are also encouraged to read the official **documentation**.

Example

Say I'm constructing a CNN, and I'd like to reduce the dimensionality of a convolutional layer by following it with a max pooling layer. Say the convolutional layer has size `(100, 100, 15)`, and I'd like the max pooling layer to have size `(50, 50, 15)`. I can do this by using a 2x2 window in my max pooling layer, with a stride of 2, which could be constructed in the following line of code:

```
MaxPooling2D(pool_size=2, strides=2)
```

If you'd instead like to use a stride of 1, but still keep the size of the window at 2x2, then you'd use:

```
MaxPooling2D(pool_size=2, strides=1)
```

Checking the Dimensionality of Max Pooling Layers

Copy and paste the following code into a Python executable named `pool-dims.py`:

```
from keras.models import Sequential
from keras.layers import MaxPooling2D

model = Sequential()
model.add(MaxPooling2D(pool_size=2, strides=2, input_shape=(100, 100, 15)))
model.summary()
```

Run `python path/to/pool-dims.py` and look at the output. It should appear as follows:

```
max_pooling2d_1 (MaxPooling2 (None, 50, 50, 15)        0
=================================================================
Total params: 0
Trainable params: 0
Non-trainable params: 0
_________________________________________________________________
```

Feel free to change the arguments in your `pool-dims.py` file, and check how the shape of the max pooling layer changes.

NEXT