```
# Define a simple CNN
model = Sequential([
    Conv2D(filters=8, kernel_size=(3,3), strides=(1,1), padding='valid', input_shape=(32,32,3),
name='conv1'),
    Conv2D(filters=16, kernel_size=(3,3), strides=(1,1), padding='same', name='conv2'),
    MaxPooling2D(pool_size=(2,2), strides=(2,2), name='pool1'),
    Conv2D(filters=32, kernel_size=(3,3), strides=(2,2), padding='valid', name='conv3'),
    Flatten()
])
```

Formulas to remember

```
                          I          K          P          S
# Formulas
cnn_output_size = (input_size - kernel_size + 2 * padding) / stride + 1

max_pool_output_size = (input_size - pool_size) / stride + 1
```

Conv 1 layer

$$O = \frac{I - K + 2P}{S} + 1$$

$$O = \frac{32 - 3 + 2 \cdot 0}{1} + 1$$

$$= 32 - 3 + 1$$

$$= 30$$

Output :- $30 \times 30 \times 8$

Conv 2 Layer

$$O = \frac{30 - 3 + 2 \cdot 1}{1} + 1$$

$$= 30 - 3 + 2 + 1$$

$$= 30$$

Output $= 30 \times 30 \times 16$

Max Pooling Layer

$$O = \frac{30 - 2}{2} + 1$$

$$= \frac{28}{2} + 1$$

$$= 14 + 1 = 15$$

Output $= 15 \times 15 \times 16$

Conv 3 Layer

$$O = \frac{15 - 3 + 2 \cdot 0}{2} + 1$$

$$= \frac{12}{2} + 1 = 7$$

Output shape $= 7 \times 7 \times 32$

Flatten Layer

$$Output = 7 \times 7 \times 32$$

$$= (1568)$$