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In [ ]: import tensorflow.keras as keras
        from tensorflow.keras import layers
        from tensorflow.keras import models
        from tensorflow.keras.datasets import mnist
        import tensorflow.keras.utils as np_utils
        from keras.optimizers import SGD
```

```
In [ ]: model = models.Sequential()

model.add(layers.Convolution2D(64, 3, padding="same", activation='relu', input_shape=(224,224, 3)))
model.add(layers.Convolution2D(64, 3, padding="same", activation='relu'))
model.add(layers.MaxPooling2D((2,2), strides=(2,2)))

model.add(layers.Convolution2D(128, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(128, 3, padding="same", activation='relu'))
model.add(layers.MaxPooling2D((2,2), strides=(2,2)))

model.add(layers.Convolution2D(256, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(256, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(256, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(256, 3, padding="same", activation='relu'))
model.add(layers.MaxPooling2D((2,2), strides=(2,2)))

model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(256, 3, padding="same", activation='relu'))
model.add(layers.MaxPooling2D((2,2), strides=(2,2)))

model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.Convolution2D(512, 3, padding="same", activation='relu'))
model.add(layers.MaxPooling2D((2,2), strides=(2,2)))

model.add(layers.Flatten())
model.add(layers.Dense(4096, activation='relu'))
model.add(layers.Dropout(0.5))
model.add(layers.Dense(4096, activation='relu'))
model.add(layers.Dropout(0.5))
model.add(layers.Dense(1000, activation='softmax'))
```

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In [ ]: model.summary()
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Model: "sequential_2"

Layer (type)	Output Shape	Param #
=====		
conv2d_4 (Conv2D)	(None, 224, 224, 64)	1792
conv2d_5 (Conv2D)	(None, 224, 224, 64)	36928
max_pooling2d_2 (MaxPooling2D)	(None, 112, 112, 64)	0
conv2d_6 (Conv2D)	(None, 112, 112, 128)	73856
conv2d_7 (Conv2D)	(None, 112, 112, 128)	147584
max_pooling2d_3 (MaxPooling2D)	(None, 56, 56, 128)	0
conv2d_8 (Conv2D)	(None, 56, 56, 256)	295168
conv2d_9 (Conv2D)	(None, 56, 56, 256)	590080
conv2d_10 (Conv2D)	(None, 56, 56, 256)	590080
conv2d_11 (Conv2D)	(None, 56, 56, 256)	590080
max_pooling2d_4 (MaxPooling2D)	(None, 28, 28, 256)	0
conv2d_12 (Conv2D)	(None, 28, 28, 512)	1180160
conv2d_13 (Conv2D)	(None, 28, 28, 512)	2359808
conv2d_14 (Conv2D)	(None, 28, 28, 512)	2359808
conv2d_15 (Conv2D)	(None, 28, 28, 256)	1179904
max_pooling2d_5 (MaxPooling2D)	(None, 14, 14, 256)	0
conv2d_16 (Conv2D)	(None, 14, 14, 512)	1180160
conv2d_17 (Conv2D)	(None, 14, 14, 512)	2359808
conv2d_18 (Conv2D)	(None, 14, 14, 512)	2359808
conv2d_19 (Conv2D)	(None, 14, 14, 512)	2359808
max_pooling2d_6 (MaxPooling2D)	(None, 7, 7, 512)	0
flatten (Flatten)	(None, 25088)	0
dense (Dense)	(None, 4096)	102764544
dropout (Dropout)	(None, 4096)	0
dense_1 (Dense)	(None, 4096)	16781312
dropout_1 (Dropout)	(None, 4096)	0
dense_2 (Dense)	(None, 1000)	4097000
=====		
Total params: 141,307,688		
Trainable params: 141,307,688		
Non-trainable params: 0		