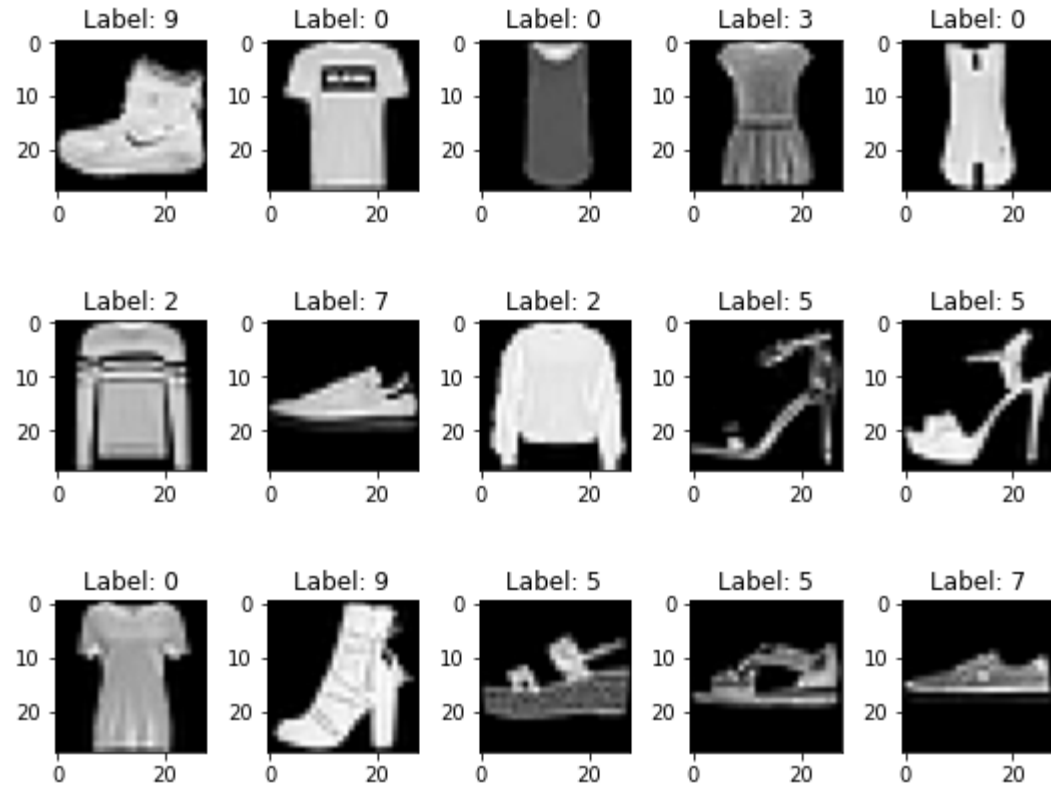


Classification and Class Activation Map

By Sang Moon

Source: Coursera course

Classification and class activation map



Input images : Fashion MNIST

Label	Description
0	T-shirt/top
1	Trouser
2	Pullover
3	Dress
4	Coat
5	Sandal
6	Shirt
7	Sneaker
8	Bag
9	Ankle boot

- Dimension of the image is 28 by 28.
- There are 60000 training images and 10000 testing images.

Classification and class activation map

Classification : CNN

Model: "sequential"

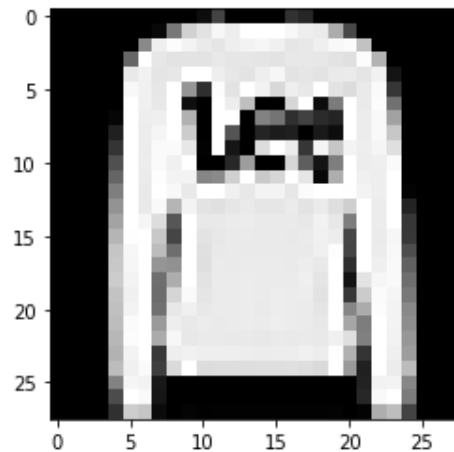
Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 28, 28, 16)	160
max_pooling2d (MaxPooling2D)	(None, 14, 14, 16)	0
conv2d_1 (Conv2D)	(None, 14, 14, 32)	4640
max_pooling2d_1 (MaxPooling2D)	(None, 7, 7, 32)	0
conv2d_2 (Conv2D)	(None, 7, 7, 64)	18496
max_pooling2d_2 (MaxPooling2D)	(None, 3, 3, 64)	0
conv2d_3 (Conv2D)	(None, 3, 3, 128)	73856
global_average_pooling2d (GlobalAveragePooling2D)	(None, 128)	0
dense (Dense)	(None, 10)	1290
Total params: 98,442		
Trainable params: 98,442		
Non-trainable params: 0		

- There are 4 convolution layers followed by pooling layers.
- The final Dense layer will output the probabilities for each class.

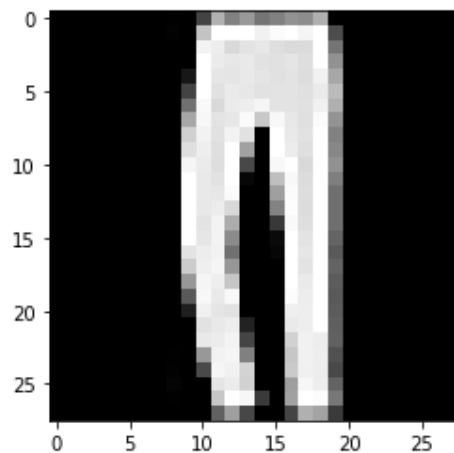
Classification and class activation map

Classification result after 50 epochs

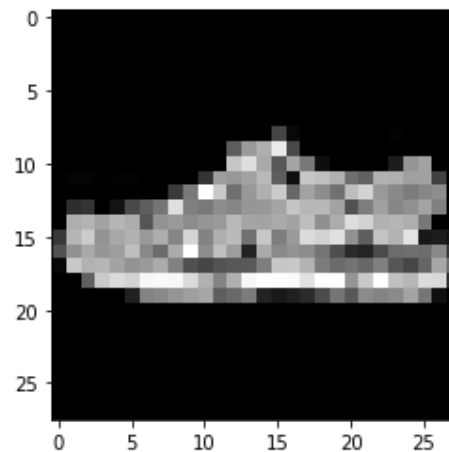
prediction : Pullover
Actual : Pullover



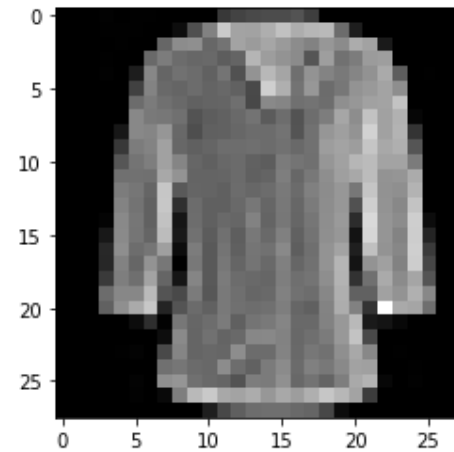
prediction : Trouser
Actual : Trouser



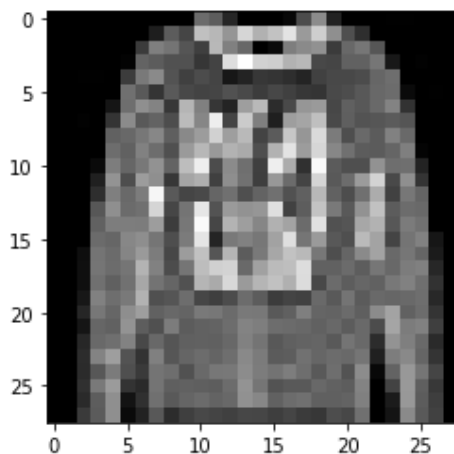
prediction : Sandal
Actual : Sandal



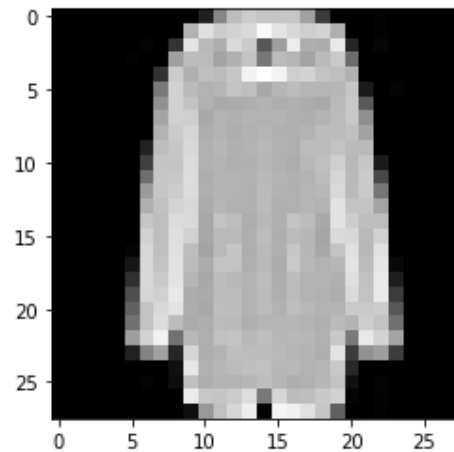
prediction : Shirt
Actual : Shirt



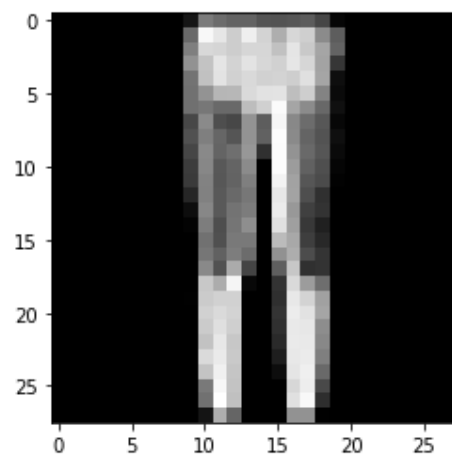
prediction : Pullover
Actual : Pullover



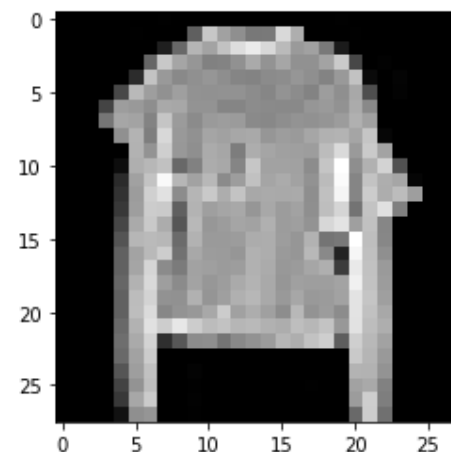
prediction : Coat
Actual : Coat



prediction : Trouser
Actual : Trouser

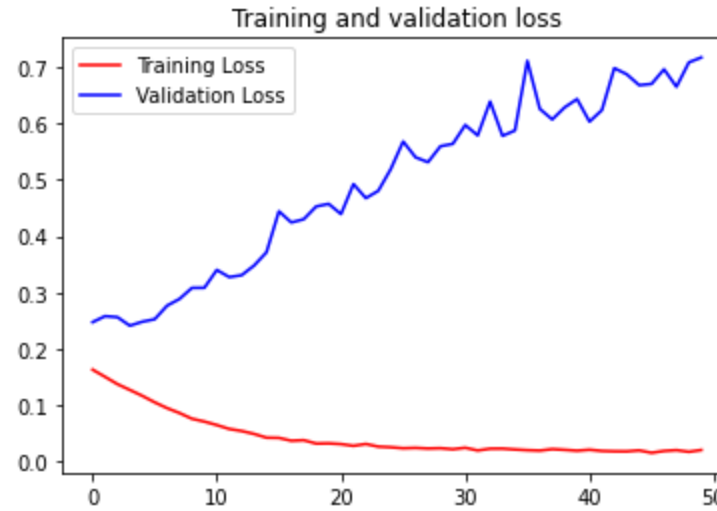
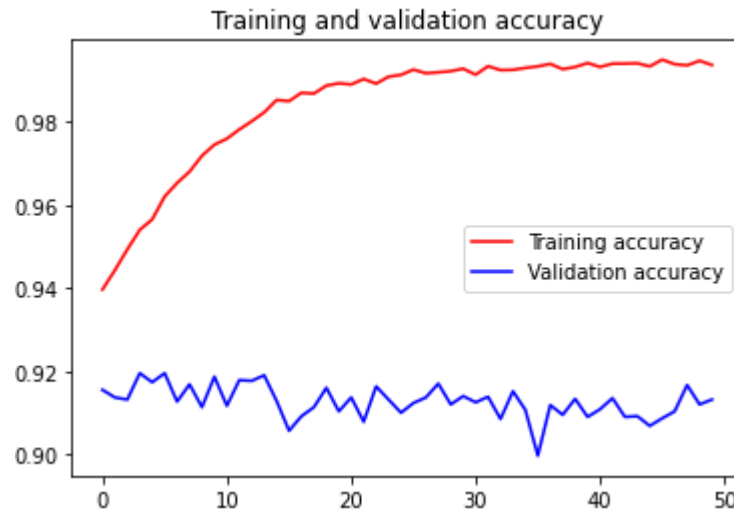


prediction : Pullover
Actual : Pullover



Classification and class activation map

Classification result after 50 epochs

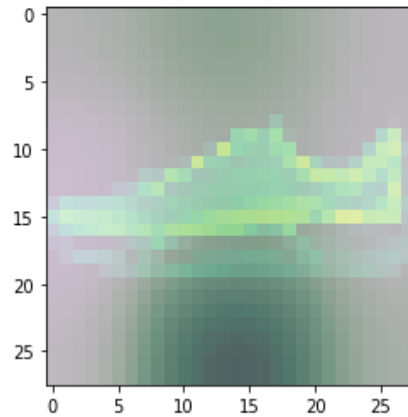


- Validation data shows the model overfit to the training data.

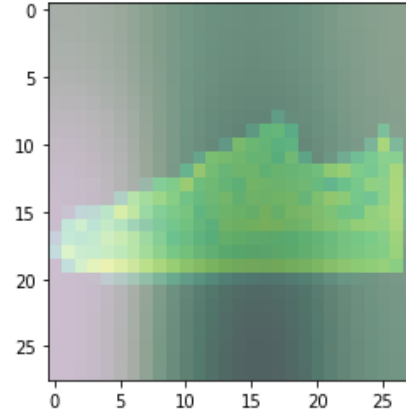
Classification and class activation map

Class activation map

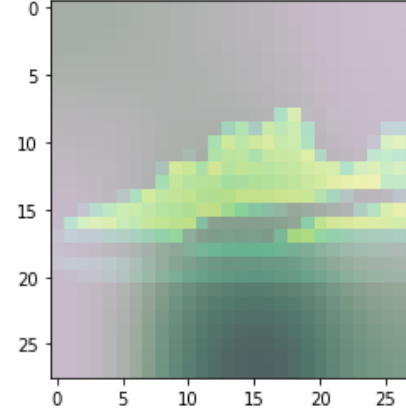
Predicted Class = 7, Probability = 0.9998702



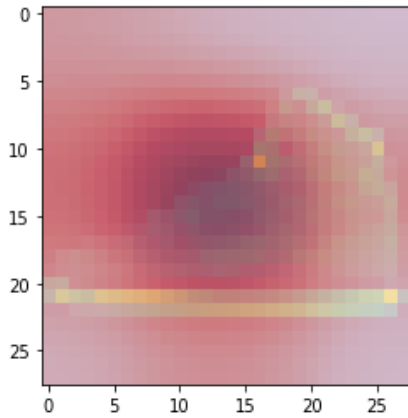
Predicted Class = 7, Probability = 0.9996964



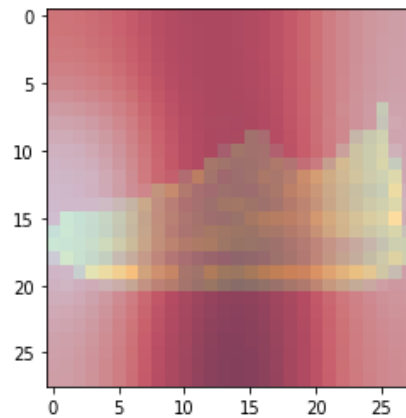
Predicted Class = 7, Probability = 0.999984



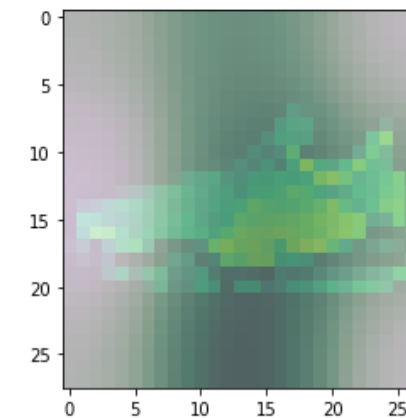
Predicted Class = 7, Probability = 0.8651899



Predicted Class = 7, Probability = 0.9264911



Predicted Class = 7, Probability = 0.999137



- Dart spots were given less importance when categorizing the image