Kaggle: House Prices: Advanced Regression Techniques

- 比賽敘述:利用 42000 筆手寫數字資料，辨識另外 28000 筆手寫數字資料
- 資料敘述:資料為 MNIST 的手寫數字資料 ，一張圖的大小為 28*28
- 使用到 Python(Pandas, Keras)

CNN 結構:

```
model.add(Conv2D(32, (5,5), activation ='relu', input_shape = (28,28,1)))
model.add(MaxPool2D(pool_size=2))
model.add(BatchNormalization())
model.add(Dropout(0.25))

model.add(Conv2D(64, (3,3), activation ='relu'))
model.add(BatchNormalization())
model.add(Dropout(0.25))
model.add(Conv2D(64, (3,3), activation ='relu'))
model.add(BatchNormalization())
model.add(Dropout(0.25))

model.add(Flatten())
model.add(Dense(64, activation = "relu"))
model.add(BatchNormalization())
model.add(Dropout(0.25))
model.add(Dense(32, activation = "relu"))
model.add(BatchNormalization())
model.add(Dropout(0.25))
model.add(Dense(10, activation = "softmax"))
```

成功辨識 99.6%的 testing data。

以下為此模型在 training data 中一些預測錯誤的例子:

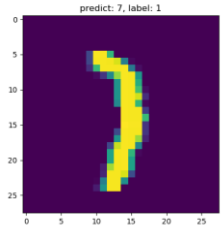	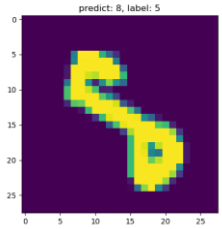	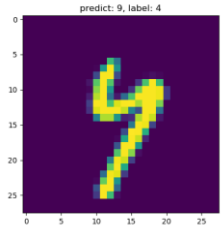
Fig 1: predict 7, label 1	Fig 2: predict 8, label 5	Fig 3: predict 9, label 4
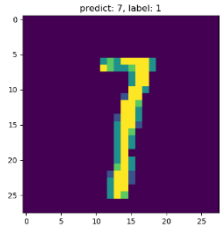	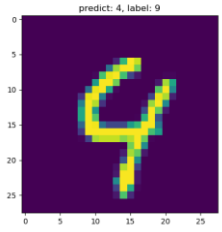	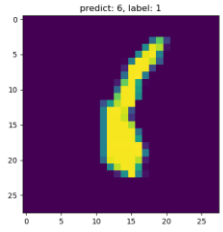
Fig 4: predict 7, label 1	Fig 5: predict 4, label 9	Fig 6: predict 6, label 1

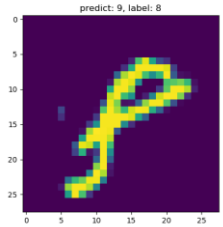	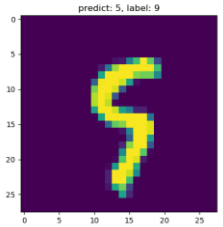	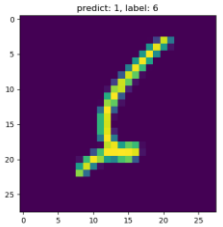
Fig 7: predict 9, label 8	Fig 8: predict 5, label 9	Fig 9: predict 1, label 6
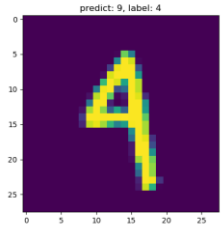	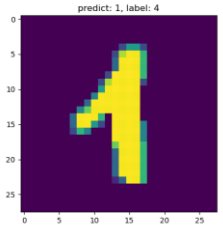	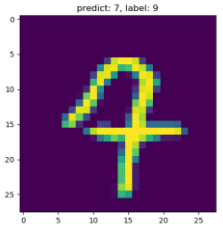
Fig 10: predict 9, label 4	Fig 11: predict 1, label 4	Fig 12: predict 7, label 9