1. 依據你的實驗 最好組合是:

Learning rate = 0.004

Activation function = tanh

Optimizer = [Nadam](https://keras.io/api/optimizers/Nadam)

準確率 = 0.97

01-測試不同learning rate 觀察測試資料集的預測準確率

|  |  |  |
| --- | --- | --- |
| Learning rate | 測試資料集的準確度 |  |
| 0.001 | 0.67 |  |
| 0.002 | 0.57 |  |
| 0.004 | 0.97 |  |
| 0.008 | 0.93 |  |
| 0.01 | 0.90 |  |
| 0.02 | 0.93 |  |
| 0.04 | 0.93 |  |
| 0,08 | 0.97 |  |
| 0.1 | 0.93 |  |
| 0.2 | 0.90 |  |
| 0.4 | 0.30 |  |
| 0.8 | 0.60 |  |
| 1.0 | 0.60 |  |

02- 測試不同activation functions 觀察預測準確率 固定learning rate =0.01

|  |  |  |
| --- | --- | --- |
| activation function | 測試資料集的準確度 |  |
| sigmod | 0.93 |  |
| relu | 0.90 |  |
| tanh | 0.97 |  |
| elu | 0.90 |  |
| selu | 0.93 |  |

03-測試不同Optimizers 觀察預測準確率 固定learning rate =0.01

|  |  |  |
| --- | --- | --- |
| Optimizer | 測試資料集的準確度 |  |
| * [SGD](https://keras.io/api/optimizers/sgd) | 0.33 |  |
| * [RMSprop](https://keras.io/api/optimizers/rmsprop) | 0.93 |  |
| * [Adam](https://keras.io/api/optimizers/adam) | 0.90 |  |
| * [Adadelta](https://keras.io/api/optimizers/adadelta) | 0.40 |  |
| * [Adagrad](https://keras.io/api/optimizers/adagrad) | 0.50 |  |
| * [Adamax](https://keras.io/api/optimizers/adamax) | 0.83 |  |
| * [Nadam](https://keras.io/api/optimizers/Nadam) | 0.97 |  |
| * [Ftrl](https://keras.io/api/optimizers/ftrl) | 0.30 |  |