Student name : WONG CHUN KIU
Student id : 14112109d

At least test 5 different numbers of layers and explain the reason why you select to test those numbers of layers.
For each number of layers, you need to at least test 5 sets of neuron number

Layer 3

Layer 1	Layer 2	Layer 3	Accuracy
20	20	10	0.914163
10	10	10	0.952790
20	20	20	0.918455
30	30	30	0.991416
40	40	40	0.922747

Layer 4

Layer 1	Layer 2	Layer 3	Layer 4	Accuracy
10	20	30	40	0.952790
10	10	10	10	0.935622
20	20	20	20	0.918455
30	30	30	30	0.969957
40	40	40	40	0.965665

Layer 5

Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Accuracy
10	20	30	40	50	0.759657
10	10	20	20	30	0.922747
20	30	40	10	50	0.948498
30	30	20	20	50	0.974249
40	10	20	20	50	0.987124

Layer 1

Layer 1	Accuracy
10	0.927039
20	0.884120
30	0.884120
40	0.927039
50	0.832618

Layer 2

Layer 1	Layer 2	Accuracy
10	**10**	**0.888412**
10	**20**	**0.927039**
20	**20**	**0.892704**
40	**20**	**0.969957**
30	**20**	**0.708154**

Summarize your experience in boosting prediction accuracy when tuning the parameters

Iteration

In order to retrieve better prediction accuracy I would like to modify the iteration number during the training process. It seems under AdagradOptimizer higher iteration means better accuracy result.

30,20,10
Learning rate: 0.001
iteration: 8000
Accuracy: 0.842105

30,20,10
Learning rate: 0.001
iteration: 1000
Accuracy: 0.631579

Optimizer

Under the same setting of the learning process, difference optimizer will cause remarkable result. It seems the best optimizer would be adam in this lab.
AdadeltaOptimizer
30,20,10
Learning rate: 0.001
iteration: 5000
Accuracy: 0.543860

AdamOptimizer
30,20,10
Learning rate: 0.001
iteration: 5000
Accuracy: 0.859649

Learning rate

Under the same setting of the learning process, difference learning rate will have difference results. It seems smaller learning rate will have better result.
30,20,10
Learning rate: 0.1
iteration: 5000
Accuracy: 0.561404

 # AdamOptimizer
30,20,10
Learning rate: 0.001
iteration: 5000
Accuracy: 0.859649

Summarize the difference of using tf.estimator.DNNClassifier and tf.contrib.learn.DNNClassifier to construct and train the DNN model

 # Without optimizer
40,20,20,10
Learning rate: 0.001
iteration: 5000
Accuracy: 0.807018

 # With Adam optimizer
40,20,20,10
Learning rate: 0.001
iteration: 5000
Accuracy: 0.561404

After replace the DNNclassifier of the program that the result will be difference. If we add an optimizer for the replaced program that the accuracy will be deduced.
Also, the replace program will generate a module after training progress it will not overwrite the folder that we need to generate a uuid for the export result.

 # What I learnt
After the walkthrough, I am able to create a simple dnn model to predict the result. Also, It helps me to know the relationship of the learning rate as well as the iteration in the dnn model.

 # What I feel hard to understand
I think the example of the tensorflow is very bad. For instance, It provide a example about the estimator.DNNClassifier (https://www.tensorflow.org/get_started/estimator). However, even I copy and paste the example from this URI. It cannot successfully launch. Thanks a lot for my classmate teach me how to do.