Assignement2
CIFAR-10 CNN Classification Example

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Project 2-1

- **Goal : Implement the model structure with keras**
  → Make model

- **Model implementation**
  - **Convolution1**
  - **Pooling1**
  - **Convolution2**
  - **Pooling2**
  - **Convolution3**
  - **Convolution4**
  - **Convolution5**
  - **Fully_Connected**

Project 2-1

- Convolution1
  - 64filters
  - 5x5 kernels size
  - “same” padding
  - (1,1) strides
  - ReLU activation

- Pooling 1
  - 2x2 Pooling size
  - (2,2) strides
  - “same” padding

- Convolution2
  - 64filters
  - 5x5 kernels size
  - “same” padding
  - (1,1) strides
  - ReLU activation

- Pooling 2
  - 2x2 Pooling size
  - (2,2) strides
  - “same” padding

Project 2-1

- Convolution3
  - 64filters
  - 5x5 kernels size
  - “same” padding
  - (1,1) strides
  - ReLU activation

- Convolution4
  - 128filters
  - 3x3 kernels size
  - “same” padding
  - (1,1) strides
  - ReLU activation

- Convolution5
  - 128filters
  - 3x3 kernels size
  - “same” padding
  - (1,1) strides
  - ReLU activation

- Fully connected
  - Flat layer
  - 1024 dense layer with ReLU activation
  - dropout layer(0.5 rate)
  - 10 softmax layers

Project 2-2

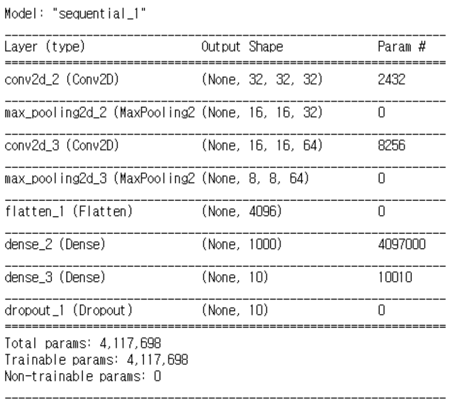
- Goal : Implement a CNN model that satisfies the requirements, and get the test accuracy of the results at least 80%

- Requirements
  - 4 Convolution layers
  - 2 Pooling layers
  - Fully connected layer

- You can freely select and implement the order of layers, kernel size, stride, types of pooling, drop out, normalization, etc.

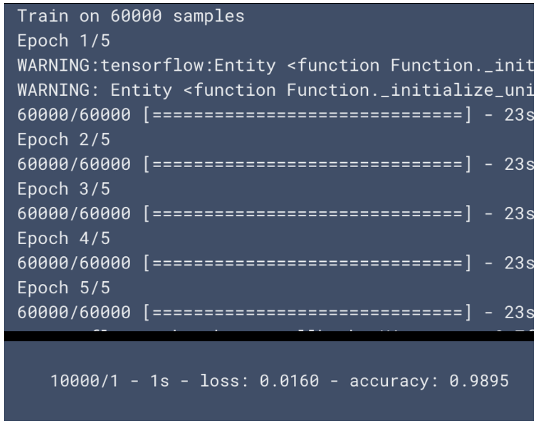
Report

- **Report format**
  - **Introduction**
  - **Result**
    For Project 2-1 : model result(test accuracy)
    For Project 2-2 : Model summary capture1), training process2), Capture of Top3 accuracy of your CNN model
  - **Consideration : Improvement method, Problem solution, etc.**
  - **Reference**



```
Model: "sequential_1"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
conv2d_2 (Conv2D)            (None, 32, 32, 32)        2432
_________________________________________________________________
max_pooling2d_2 (MaxPooling2 (None, 16, 16, 32)        0
_________________________________________________________________
conv2d_3 (Conv2D)            (None, 16, 16, 64)        8256
_________________________________________________________________
max_pooling2d_3 (MaxPooling2 (None, 8, 8, 64)          0
_________________________________________________________________
flatten_1 (Flatten)          (None, 4096)              0
_________________________________________________________________
dense_2 (Dense)              (None, 1000)              4097000
_________________________________________________________________
dense_3 (Dense)              (None, 10)                10010
_________________________________________________________________
dropout_1 (Dropout)          (None, 10)                0
=================================================================
Total params: 4,117,698
Trainable params: 4,117,698
Non-trainable params: 0
_________________________________________________________________
```

1) example



```
Train on 60000 samples
Epoch 1/5
WARNING:tensorflow:Entity <function Function._init
WARNING: Entity <function Function._initialize_uni
60000/60000 [==============================] - 23s
Epoch 2/5
60000/60000 [==============================] - 23s
Epoch 3/5
60000/60000 [==============================] - 23s
Epoch 4/5
60000/60000 [==============================] - 23s
Epoch 5/5
60000/60000 [==============================] - 23s

   10000/1 - 1s - loss: 0.0160 - accuracy: 0.9895
```

2) example

Submissions

- Submit your code and report at klas (make zip file)
  - Name format : Ass2_StudentID_Name.zip

- zip file format
  - StudentID_Name.pdf (Report name format)
  - Project2-1 folder
    - Proj2_1.py
    - model1.h5 (keras model save)
  - Project2-2 folder
    - Proj2_2.py
    - model2.h5 (keras model save)

- Due date
  - 12/4(Sun) 23:59:59