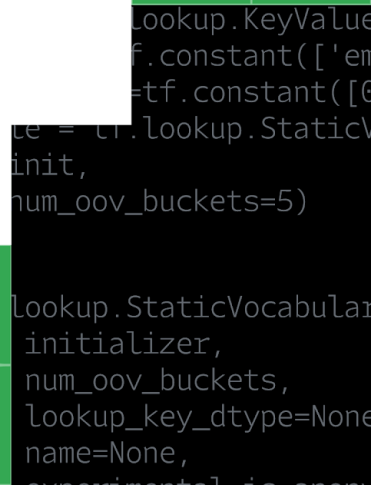
Google Developer Student Clubs

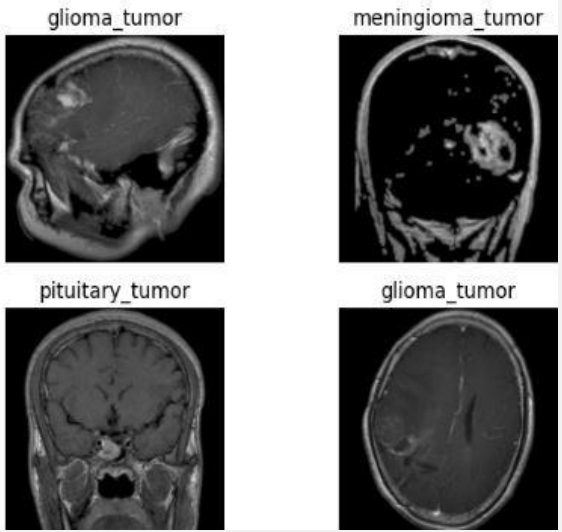
# Mini Project Week 02

Basic 2조: 김예림, 한유진



## Week1 Review

# **Brain Tumor**(Glioma/Meningioma/Pituitary)와 **Normal** Classification




Recall로 모델의 성능 판단

Base Code
: ResNet50 + (Flatten -> Dense)

## Data Preprocess - Data Augmentation

# 제한된 데이터셋을 최대한 활용하기 위한 방안

```
data_augmentation = tf.keras.Sequential([
    tf.keras.layers.experimental.preprocessing.Rescaling(1./255),
    tf.keras.layers.experimental.preprocessing.RandomFlip("horizontal"),
    tf.keras.layers.experimental.preprocessing.RandomRotation(0.1),
    tf.keras.layers.experimental.preprocessing.RandomZoom(0.1),
])
```

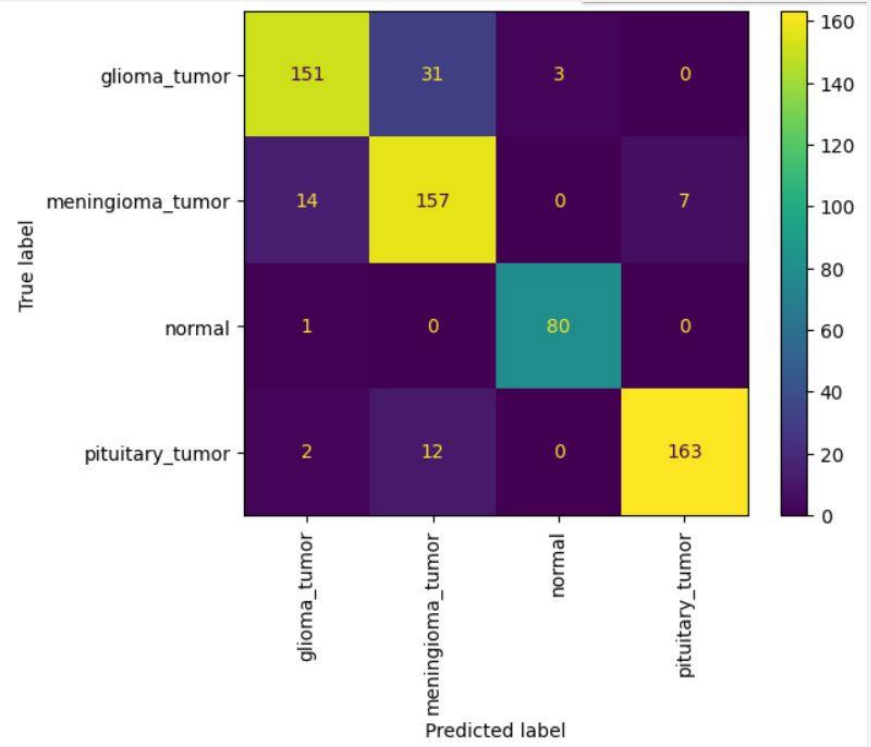
Rescaling: 표준화

Random Rotation: 회전

Random Flip: 반전

Random Zoom: 확대

# Data Preprocess - Data Augmentation



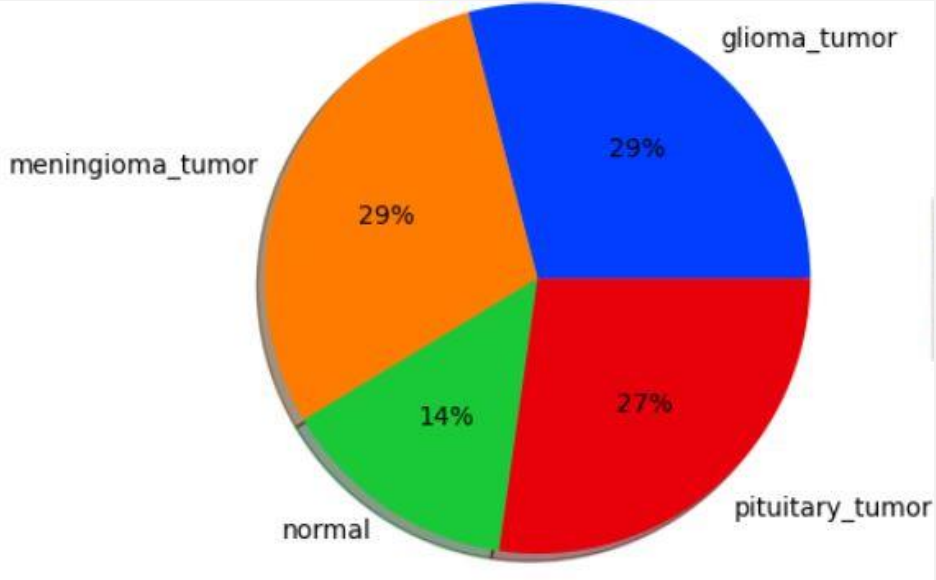

Accuracy: 87.60%

Recall:90.16%

+ Random Crop

+ Random Contrast

# Data Preprocess - Class Weight




Normal이 전체 데이터셋의 14%로 다른 클래스의 데이터에 비해 적음

## Resampling

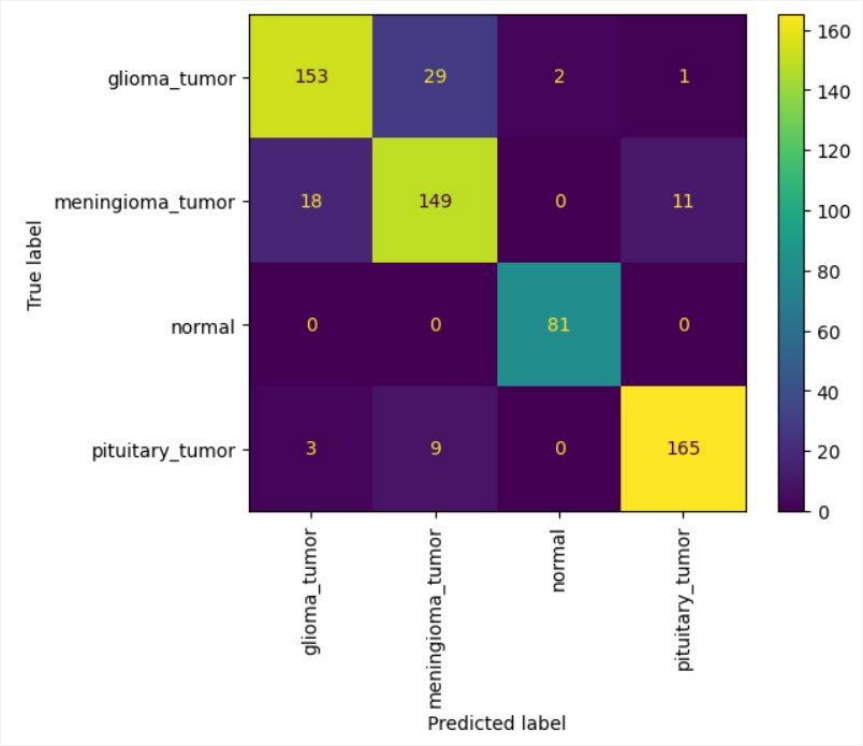
- Undersampling
- Oversampling

## Class Weight

```
class_weights = {
    0: 1.0,  # glioma_tumor
    1: 1.0,  # meningioma_tumor
    2: 1.5,  # normal
    3: 1.0   # pituitary_tumor
}
```

Normal Class: 1.5
Other Class: 1.0

# Data Preprocess - Class Weight




Accuracy: 87.92%

Recall:89.6%

## Model

1. ResNet50: 91.44% / 91.76%
2. ResNet101: 90.24% / 91.03%
3. ResNet152: 91.47% / 91.99%
4. VGGNet16: 88.21% / 88.83%
5. VGGNet19: 88.69% / 89.05%
6. MobileNet:83.20% / 83.23%
7. MobileNetV2: 84.81% / 84.48%
8. MobileNetV3Small: 90.31% / 91.46 %
9. MobileNetV3Large: 91.53 % / 91.92%

## Model

1. ResNet50
2. ResNet101
3. **ResNet152**
4. VGGNet16
5. VGGNet19
6. MobileNet
7. MobileNetV2
8. MobileNetV3Small
9. **MobileNetV3Large**

## Next Week

1. K - Fold Cross Validation
2. Hyperparameter Tuning
   - Optimizer
   - Batch Size
   - Learning Rate
   - Epoch
3. ...