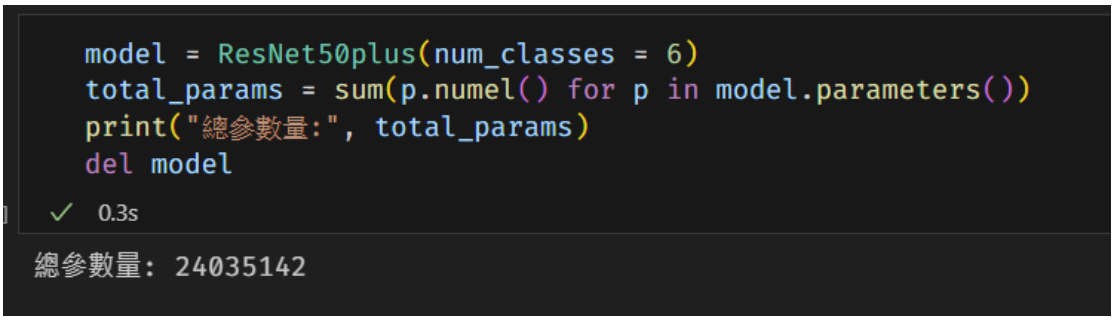
a. How did you address the problems of imbalanced data and insufficient sample size? (5 pts)

用 RandomOverSampler 這個函式庫

b. Reproductivity of the results (the first part 2 pts and the second part 4 pts)

基本上結果一樣

c. Number of parameters: Please write the parameter count of your final selected model to the Kaggle competition (2 pts)



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d. The difficulty during training (the first part 3 pts and the second part 8 pts)

基本上跟上次一樣，就差在多了解決 imbalanced data

e. Briefly explain the structures of the models you are using for the second part: You are required to do analyses of single slice, late fusion, early fusion, and 3D CNNs (16 pts)

```python
class ResNet50plus(nn.Module):
    def __init__(self, num_classes, input_size=(3, 50, 50), features_grad=False):
        super().__init__()
        # 本次作業指定使用Resnet50進行修改
        resnet50 = models.resnet50(weights = "IMAGENET1K_V1", progress = True)
        # Freeze the convolutional layers if features_grad is False
        if not features_grad:
            for param in resnet50.parameters():
                param.requires_grad = False
        # Replace the final fully connected layer with a custom one
        # ResNet50's final layer (fc) output is typically 2048-dimensional
        in_features = resnet50.fc.in_features
        # Modify the fully connected layer for custom input size and additional features
        self.resnet = nn.Sequential(
            *list(resnet50.children())[:-1],  # Take all layers except the final fully connected layer
            nn.Flatten(),
        )
        # New fully connected layers to combine with additional inputs (e.g., age, gender)
        self.fc = nn.Sequential(
            nn.Linear(in_features + 2, 256),  # +2 to account for age and gender features
            nn.BatchNorm1d(256),
            nn.ReLU(),
            nn.Dropout(0.5),
            nn.Linear(256, num_classes)
        )
    def forward(self, images, ages, genders):
        # Pass the image through ResNet backbone
        x = self.resnet(images)
        # Concatenate additional features (ages, genders) with the ResNet output
        x = torch.cat((x, ages.unsqueeze(1), genders.unsqueeze(1)), dim=1)
        # Pass concatenated features through fully connected layers
        x = self.fc(x)
        return x
```

基本上跟上次一樣，差別在因為這次輸出有 6 個，所以改了 self.fc 的部分

f. You should submit compiled HTML file and ipynb notebook with name