SOIL CLASSIFICATION CHALLENGE

PART 1

- The Soil Image Classification Challenge is a machine learning competition organized by Annam.ai at IIT Ropar, serving as an initial task for shortlisted hackathon participants.
- Competitors will build models to classify each soil image into one of four categories: Alluvial soil, Black soil, Clay soil, or Red soil.

Models

- Pretrained Models with custom heads have been used with 5-fold cross validation and image size of 512
- Models used are
  - resnext50_32x4d
  - EfficientnetB3
  - EfficientnetB5
  - EfficientnetB7
  - Vision Transformer Patch 16 384

5 folds

```
fold  label_encoded
0     0               106
      1                46
      2                40
      3                53
1     0               106
      1                47
      2                40
      3                52
2     0               106
      1                46
      2                39
      3                53
3     0               105
      1                46
      2                40
      3                53
4     0               105
      1                46
      2                40
      3                53
dtype: int64
```

5 fold cross validation scores

MODEL	F1 SCORE	Image size	folds
tf_efficientnet_b3_ns	0.96299	512	5
tf_efficientnet_b5_ns	0.98584	512	5
tf_efficientnet_b7_ns	0.94969	512	5
vit_base_patch16_384	0.96552	384	5
resnext50_32x4d	0.96594	512	5

PART 2

- The Soil Image Classification Challenge is a machine learning competition organized by Annam.ai at IIT Ropar, serving as an initial task for shortlisted hackathon participants.
- Competitors will build models to classify the images to if they're soil image or not.

Models used

We follow a autoencoder architecture to train the images

The anomalies are detected using the reconstruction error

Top 5% are counted as anomalies

Backbone used

- EfficientnetB0 , EfficientnetB1 ,EfficientnetB3 , EfficientnetB5
- Simple Auto Encoder