# Lab3: Image classification

XXXXXXX AI for Digital Health (2025/2)

# Objective

- **Create & train** image classification model from teachable machine and pytorch library
- **Hyperparameter tuning** in model
- **Inference & evaluate** performent each model

# Material

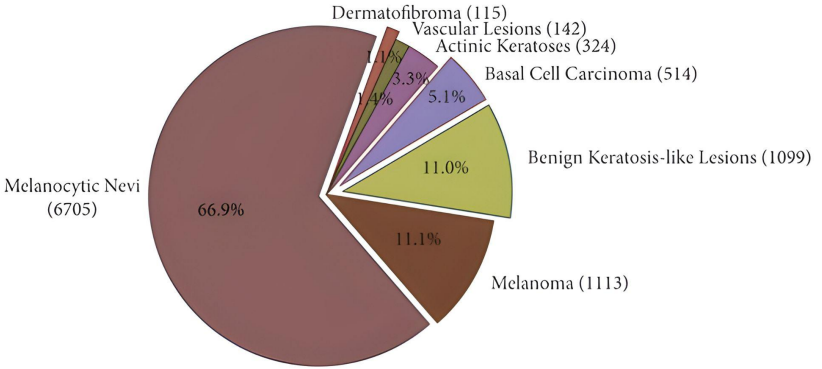
- **Google Colab** is a free cloud-based platform that run jupyter notebook (Python code) in a browser, without needing local setup.

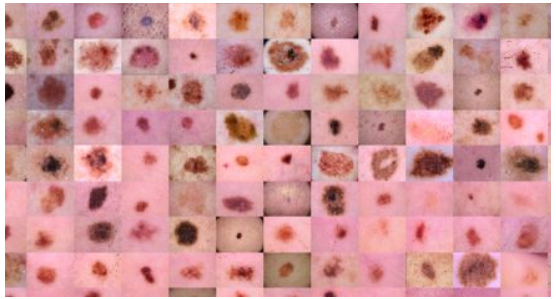
- **Teachable Machine** is a web-based tool by Google that trains machine learning models for images, audio, or poses without coding.

- **PyTorch, TenserFlow** is an deep learning library that enables building, training, and deploying neural networks using Python

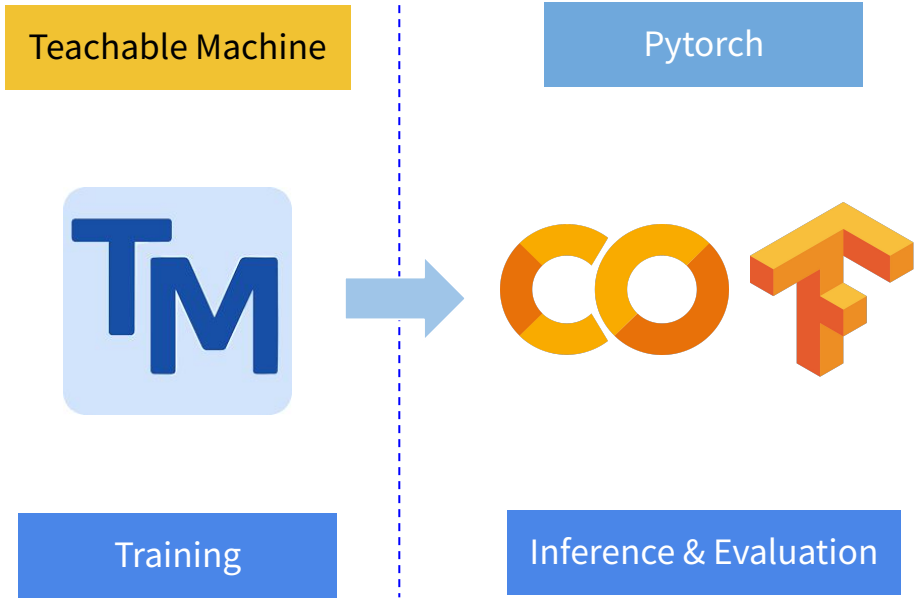
# Dataset: Skin Cancer MNIST: HAM10000

- The dataset consists of 10015 images with 10013 labeled objects belonging to 7 skin cancer classes.
- The data contains image in JPG format and documents in JSON format
- In the experiment, we reduced the amount of data and formatted it to simplify the experiment.



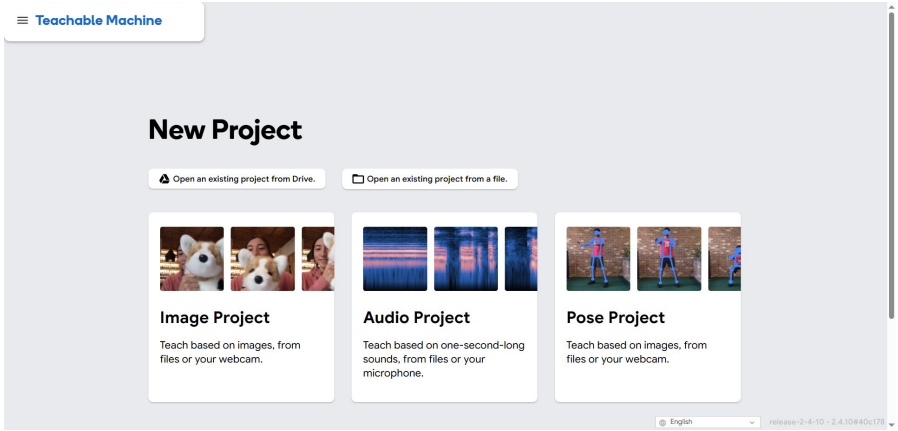



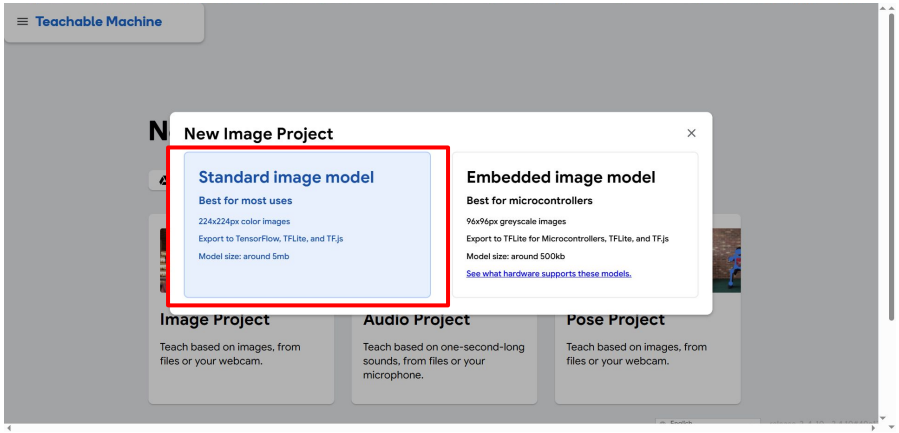
# Lab3.1: MobileNet (Teachable Machine)



# Lab3.1: MobileNet (Teachable Machine)

1) Create image project(standard image model) in Teachable Machine



# Lab3.1: MobileNet (Teachable Machine)

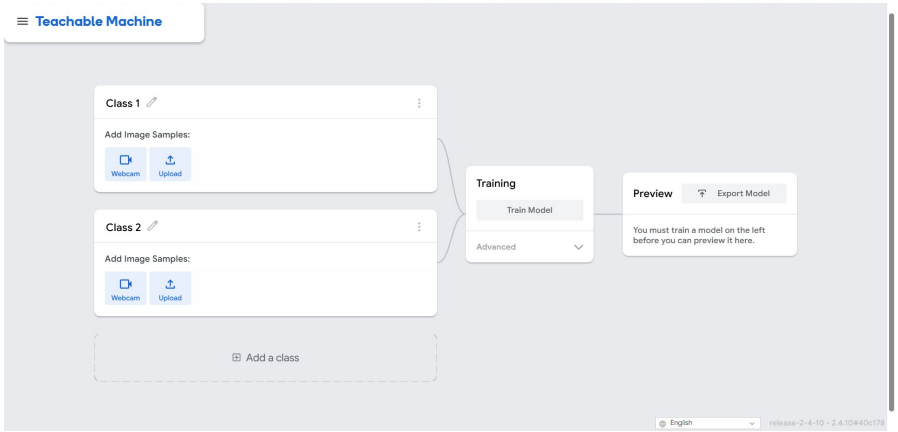
2) Add image sample and set label (Lab_3_1_HAM10000) into Teachable Machine

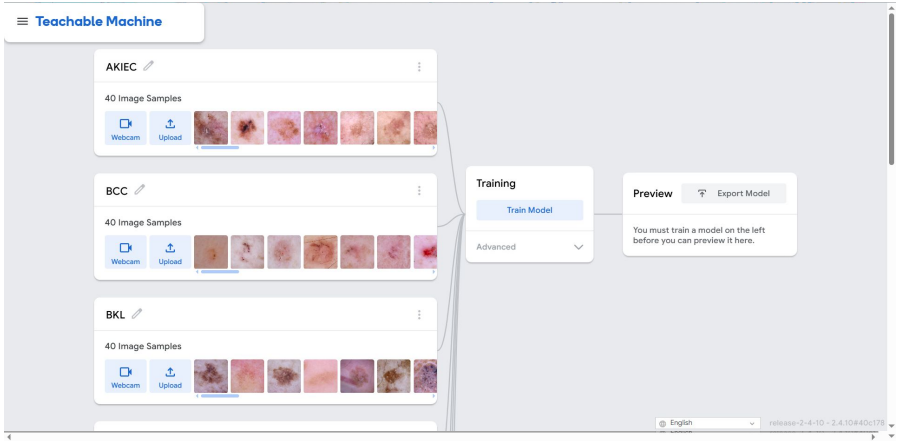
Lab_3_1_HAM10000 directory

```
Lab_3_1_HAM10000
├── train/
│   ├── AKIEC/
│   │   └── ISIC_0024329.jpg (original image)
│   └── VASC/
└── GroundTruth.csv
```

# Lab3.1: MobileNet (Teachable Machine)

2) Add image sample and set label (code/Class03_IntroDL/Lab_3_1_HAM10000.zip) into Teachable Machine

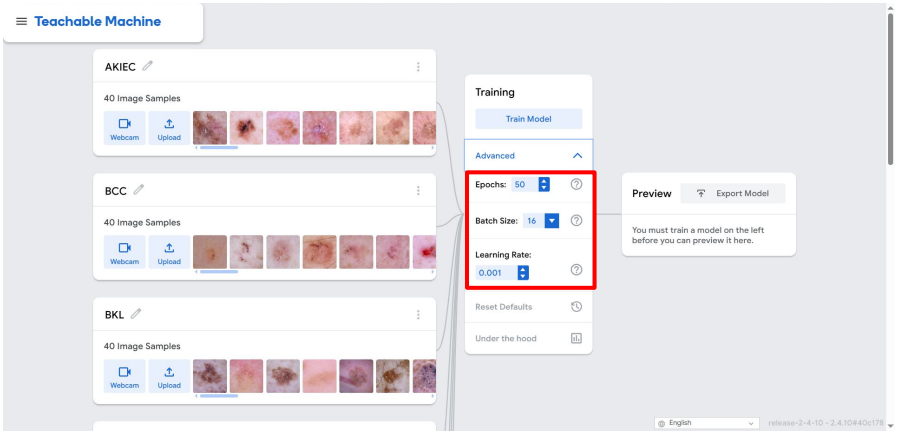


# Lab3.1: MobileNet (Teachable Machine)

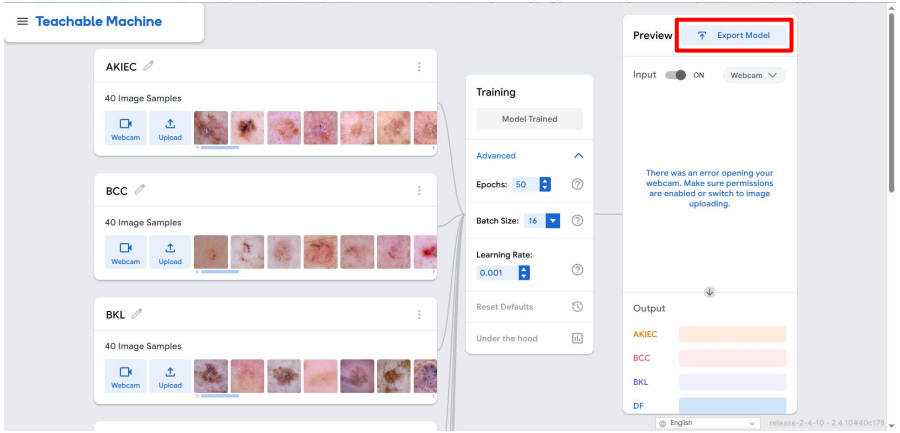
3) Tune learning parameter & Train model

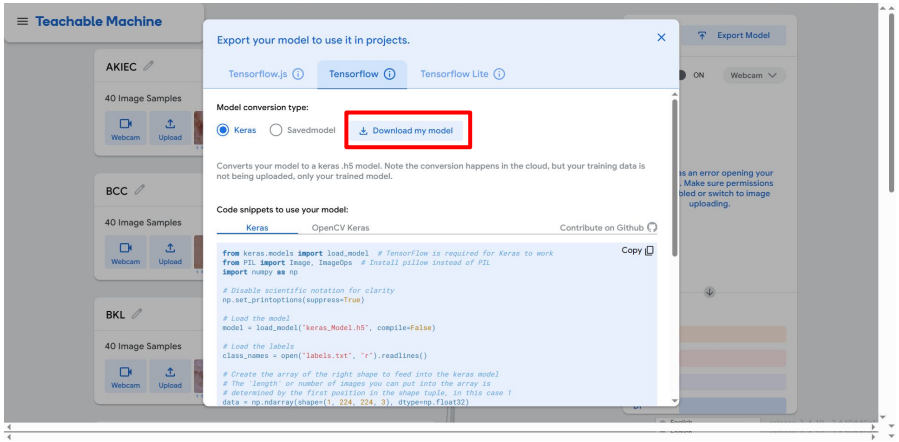
   a) epoch: [5, 20, 50, 100]
   b) learning rate: [0.00001, 0.001, 0.1]



# Lab3.1: MobileNet (Teachable Machine)

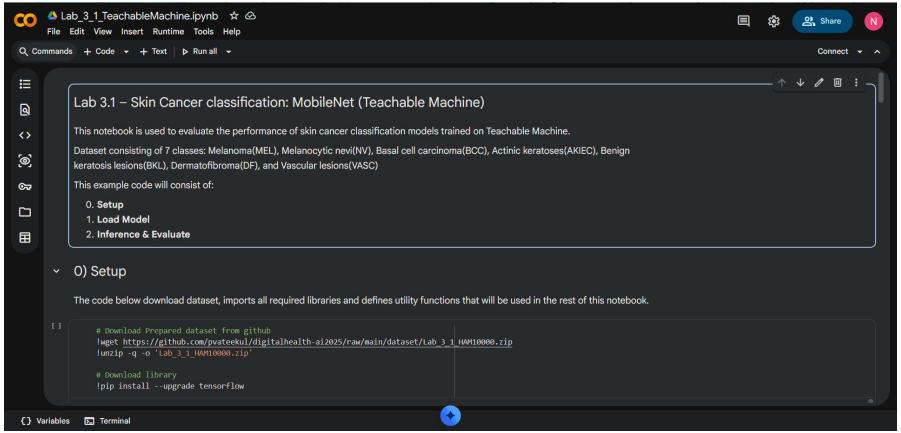
4) Export model (tensorflow version)



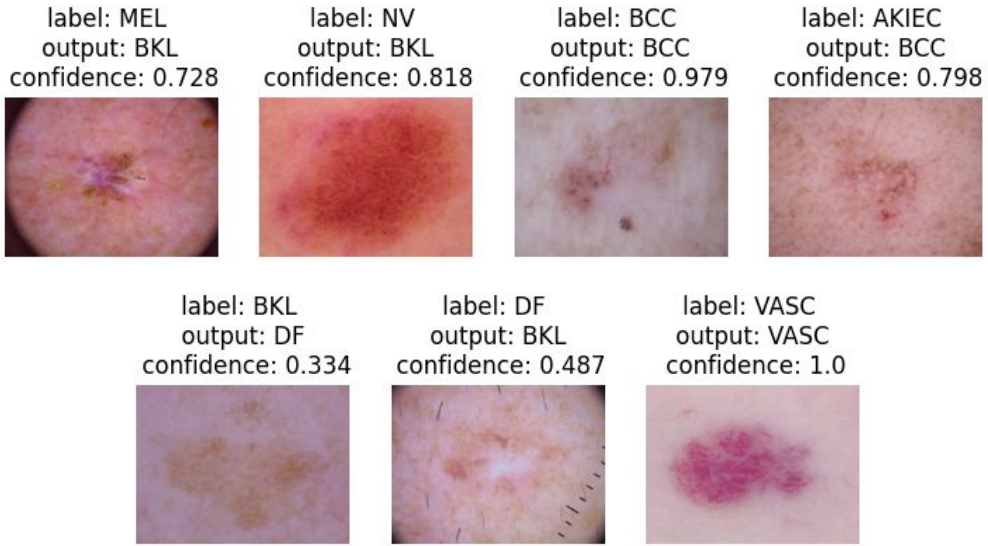
# Lab3.1: MobileNet (Teachable Machine)

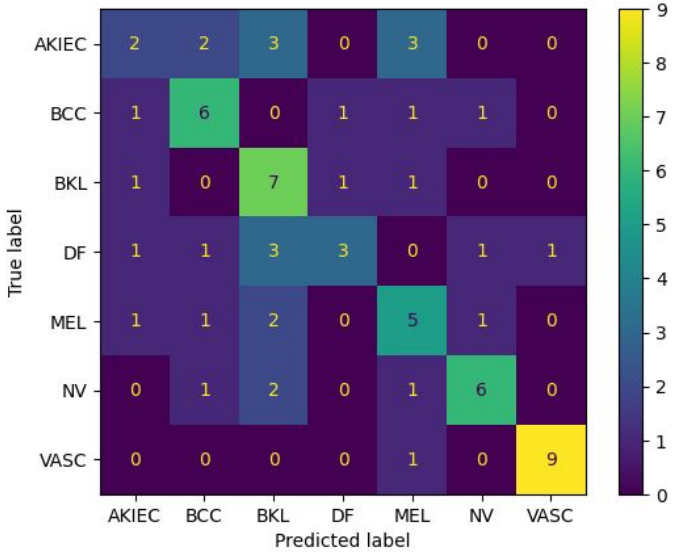
5) Open Lab_3_1_TeachableMachine.ipynb (in colab) and upload converted_keras.zip



# Lab3.1: MobileNet (Teachable Machine)

6) Run Lab_3_1_TeachableMachine.ipynb for evaluation & inference.



# Lab3.2: EfficientNet (Pytorch)

Run Lab_3_2_PyTorch.ipynb (in colab)

1) Setup
2) Load Data
3) Create Model
4) train Model
5) Inference & Evaluate