Lab6: Imaging tools (Roboflow)

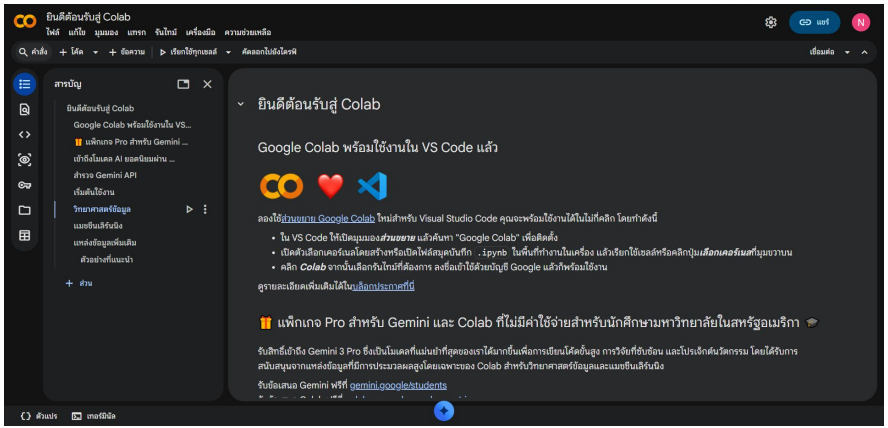
3099704 AI for Digital Health (2025/2)

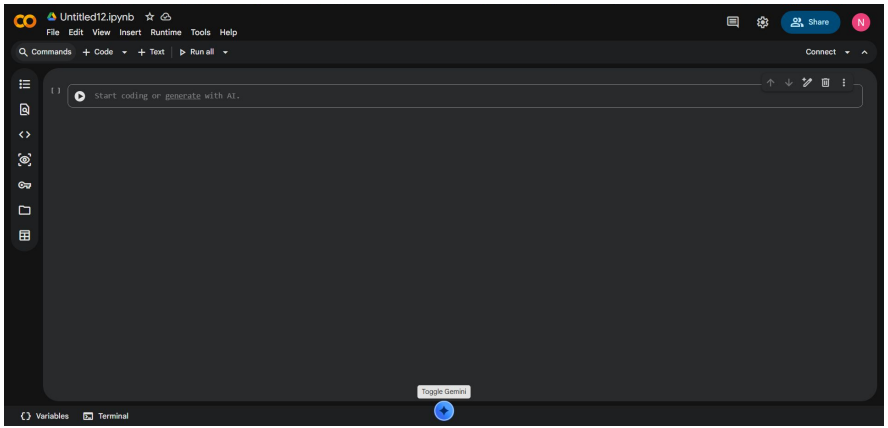
Objective

- Use the **Roboflow** to create Dataset
- Use created Dataset to train model (YOLO,UNet)

Material

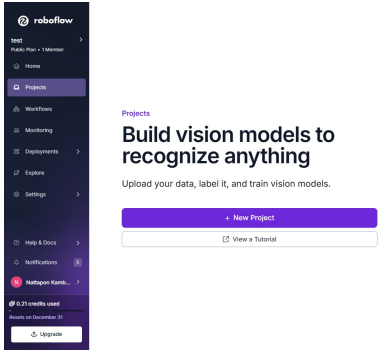
- With **Google Colab**, you don't need to install any software. All you need is a Google account, and you can start using it right away. Simply visit: https://colab.research.google.com/ or select NEW NOTEBOOK to start a new file.

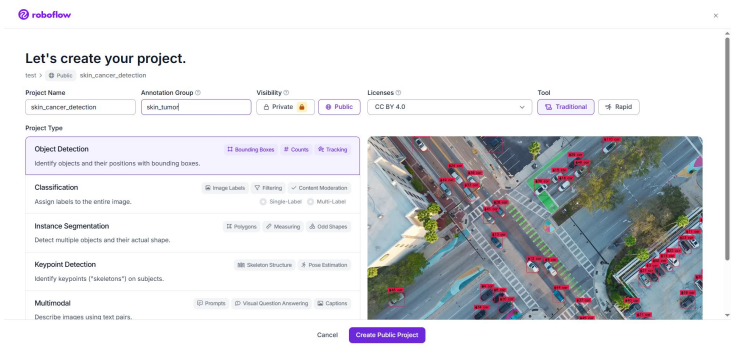




Roboflow

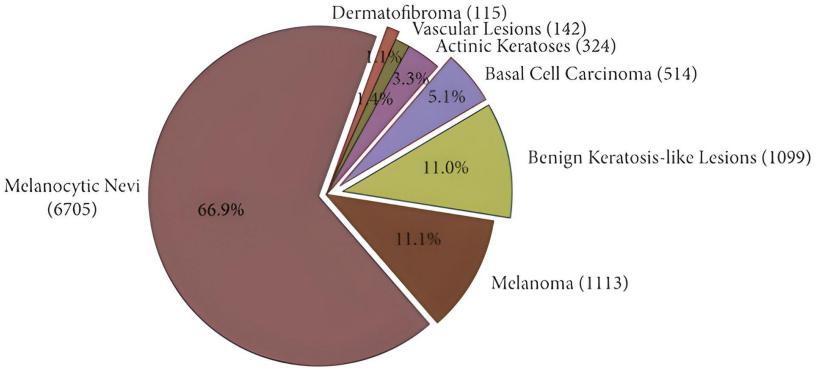
- **Roboflow** is a web-based platform that helps users easily prepare datasets. It can be accessed through a web browser at https://roboflow.com/ by signing in with a Google or GitHub account.
- Users can upload images, annotate data, apply preprocessing and data augmentation, and export datasets in formats ready for training models such as YOLO.

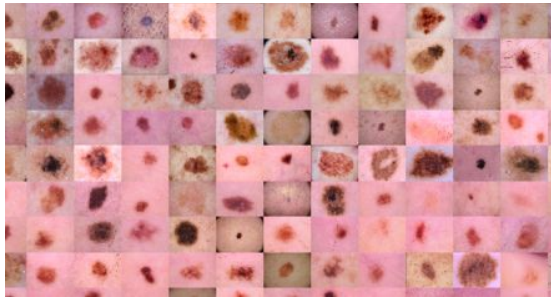




Dataset: Skin Cancer MNIST (HAM10000)

- 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

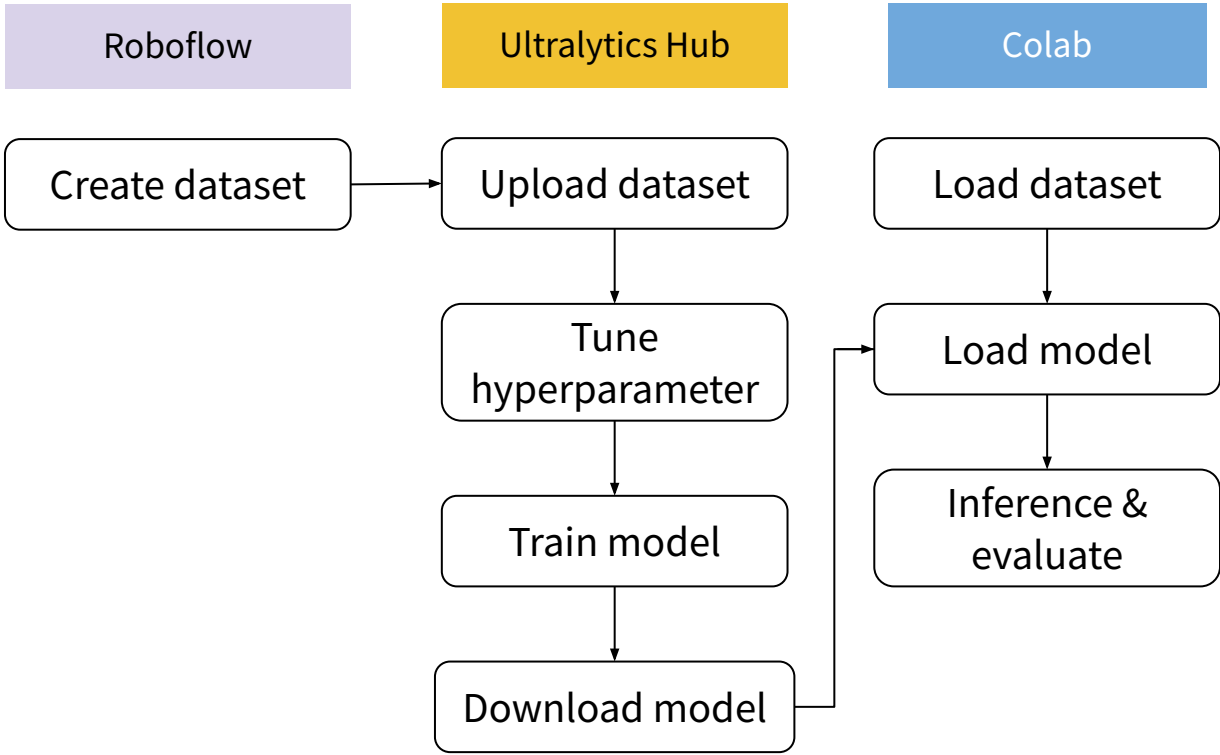




Lab6.1: Object detection dataset

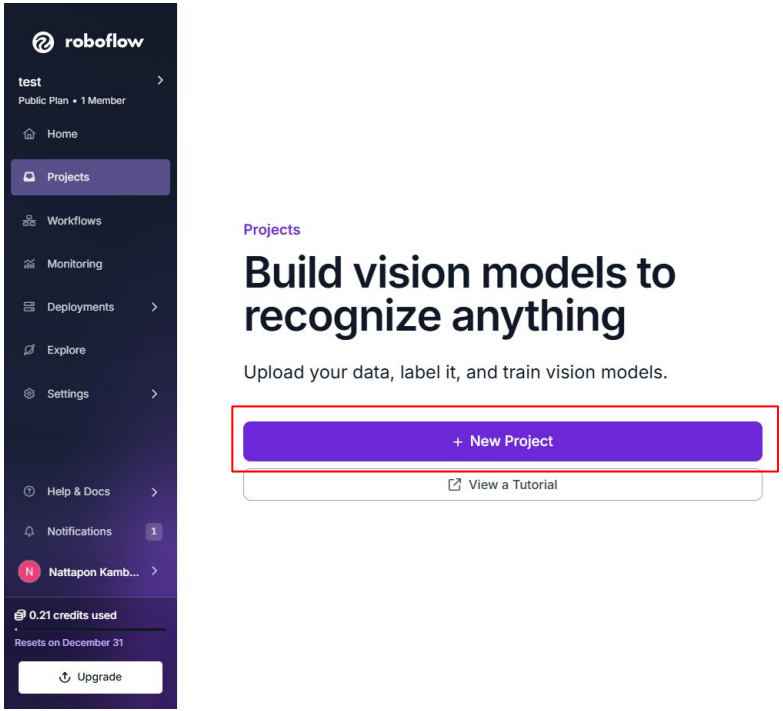
In this lab, we will repeat the experiment from **Lab 4.1 (YOLOv8n)**, but the dataset will be created using Roboflow instead.

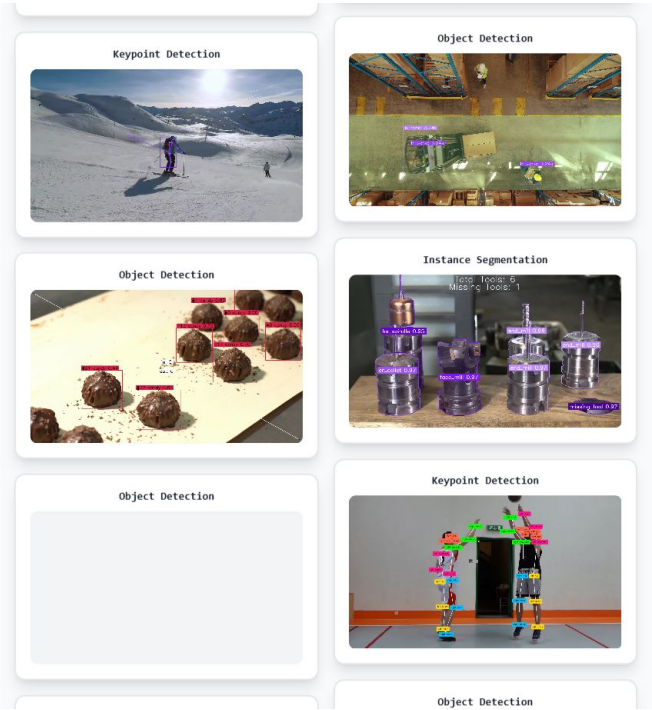
1) Load image from github
2) Create Object detection dataset in Roboflow
3) Train YOLO model in ultralytics hub
4) evaluate YOLO in Lab_6_1_ultralyricshub



Lab6.1: Object detection dataset

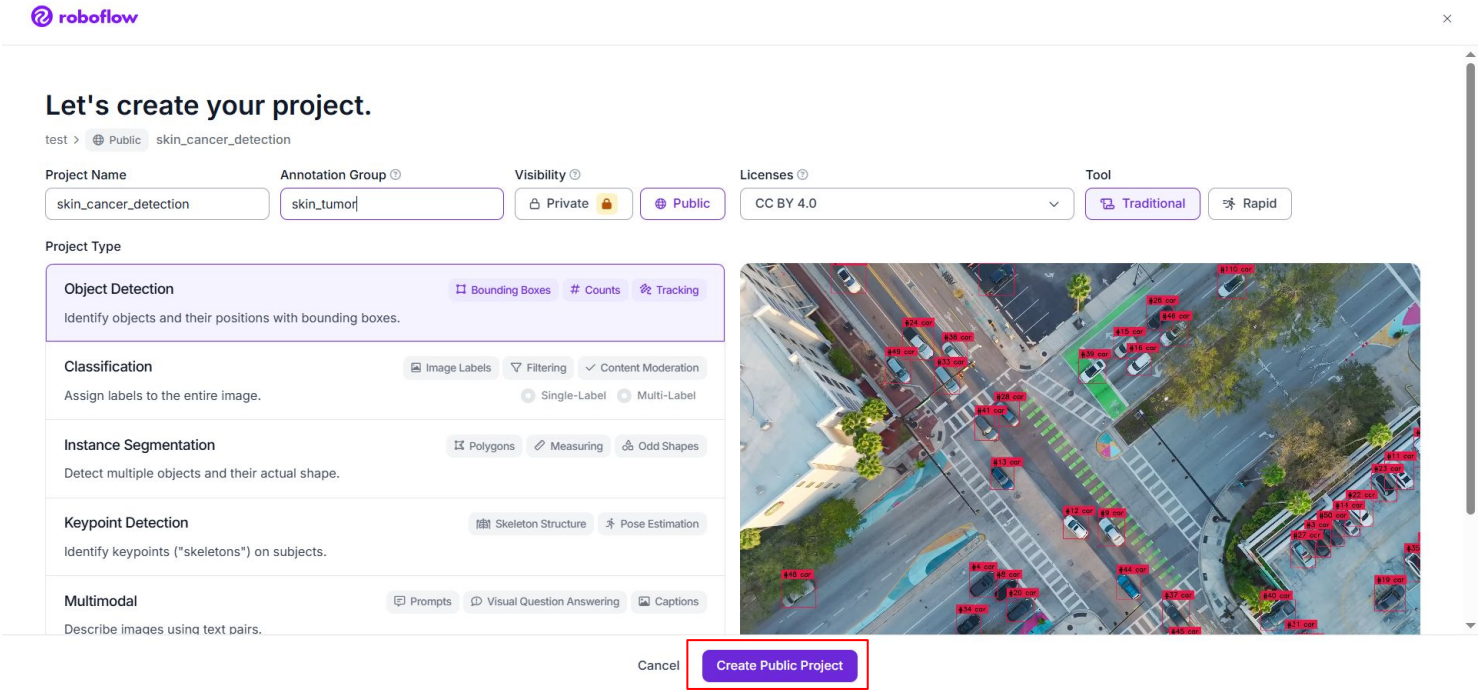
1) Sign in [Roboflow]





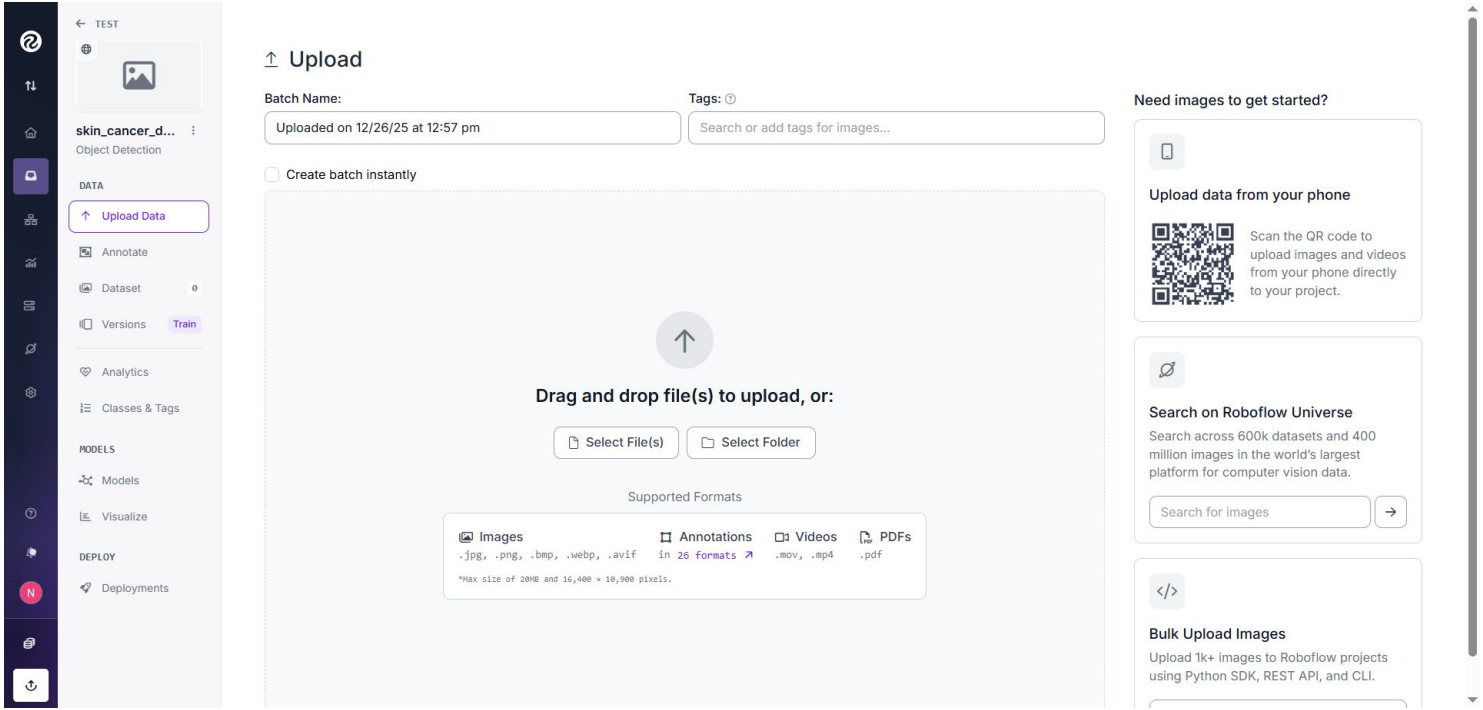
Lab6.1: Object detection dataset

2) Create new project **(Object Detection)**



Lab6.1: Object detection dataset

3) Download the dataset from GitHub, then upload in **Roboflow**.



Lab6.1: Object detection dataset

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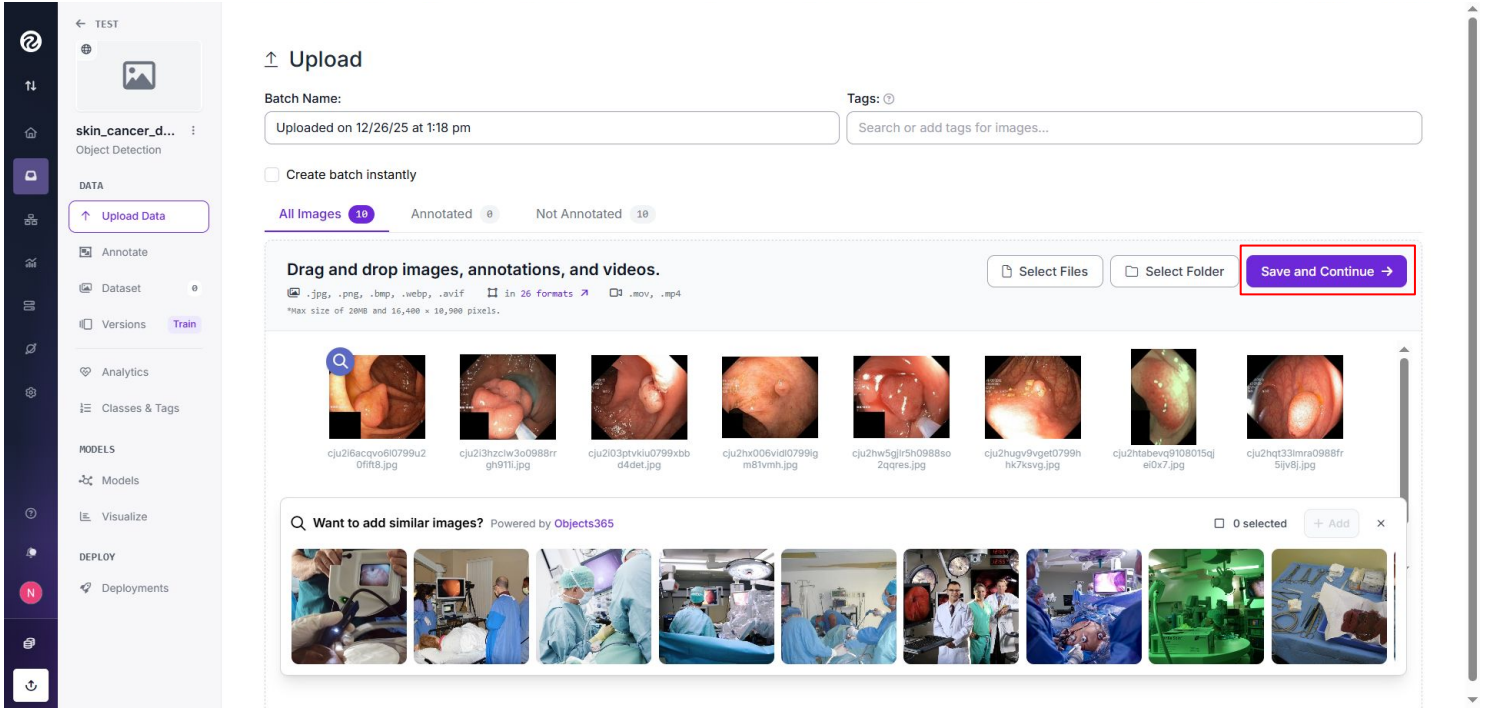
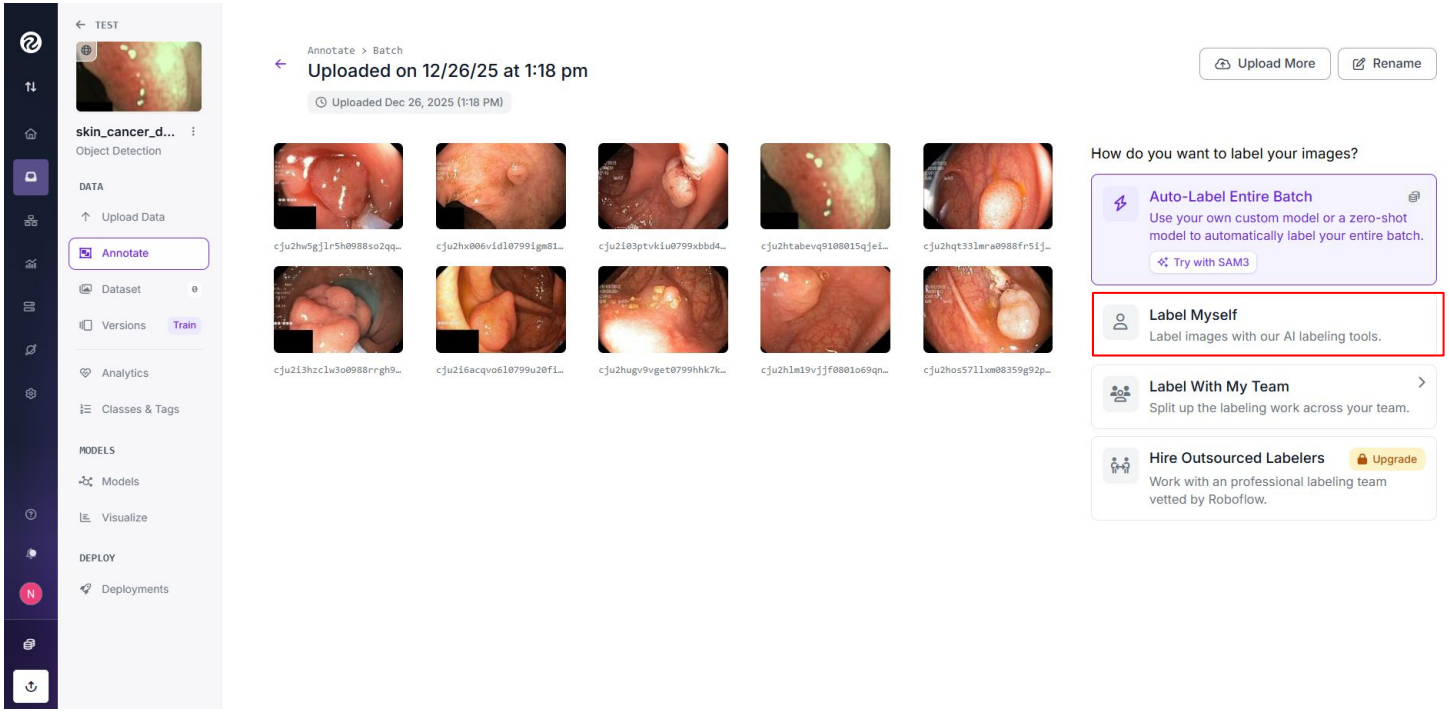


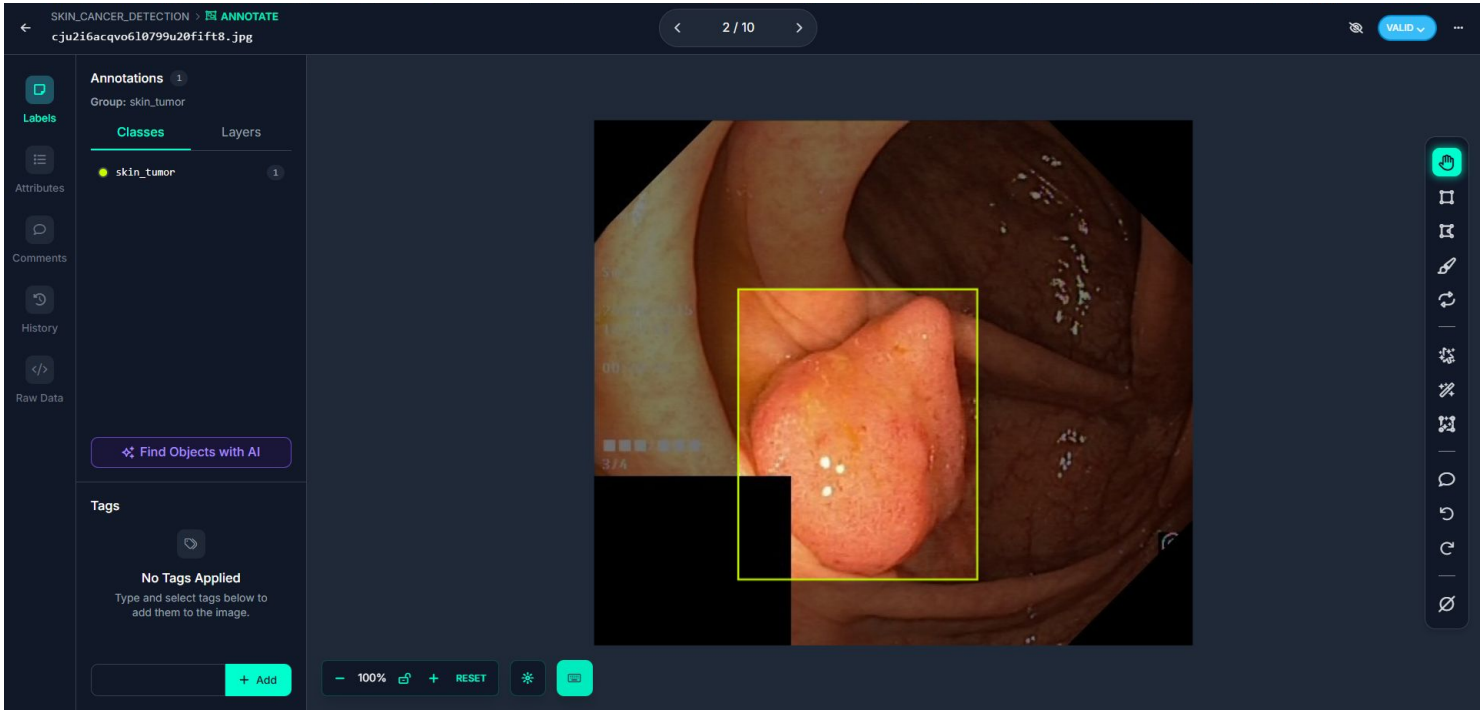
Lab6.1: Object detection dataset

4) Check “**Label Myself**”



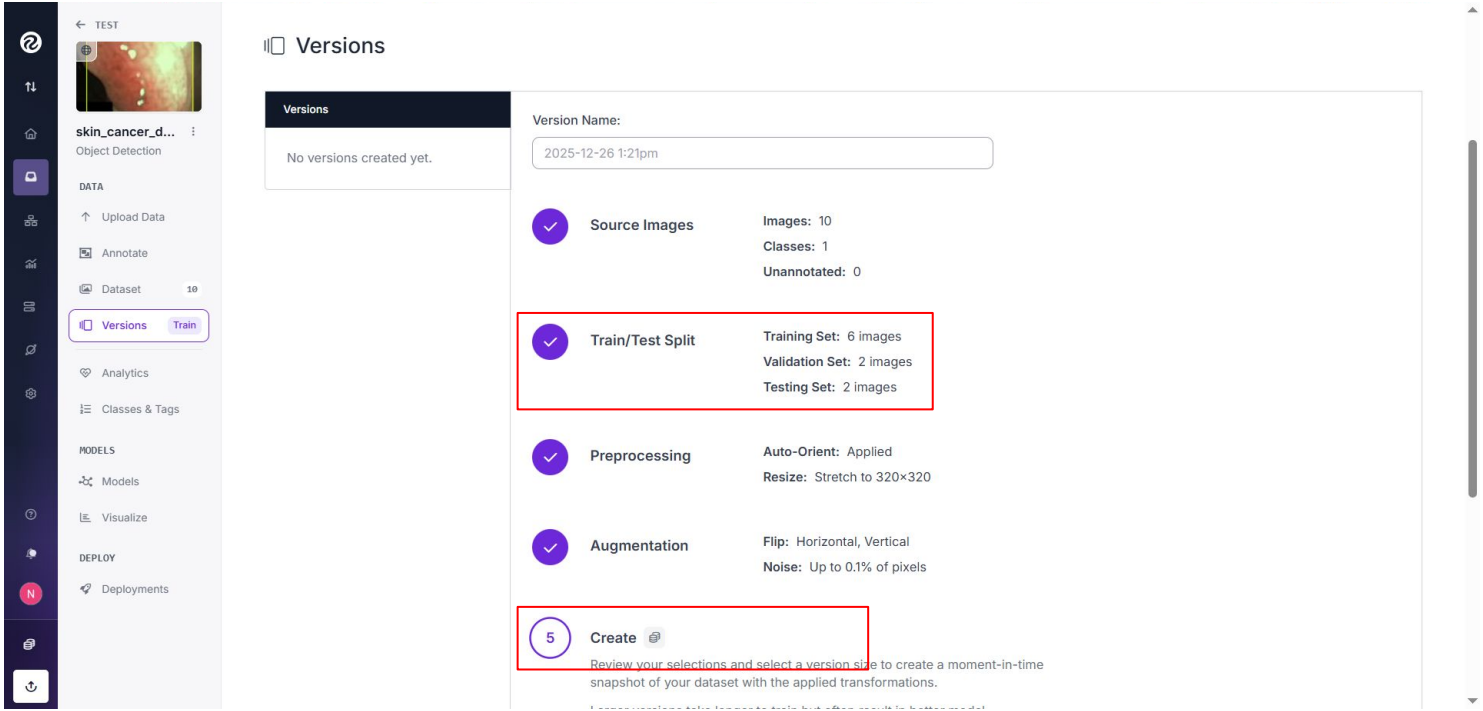
Lab6.1: Object detection dataset

5) Label polyp



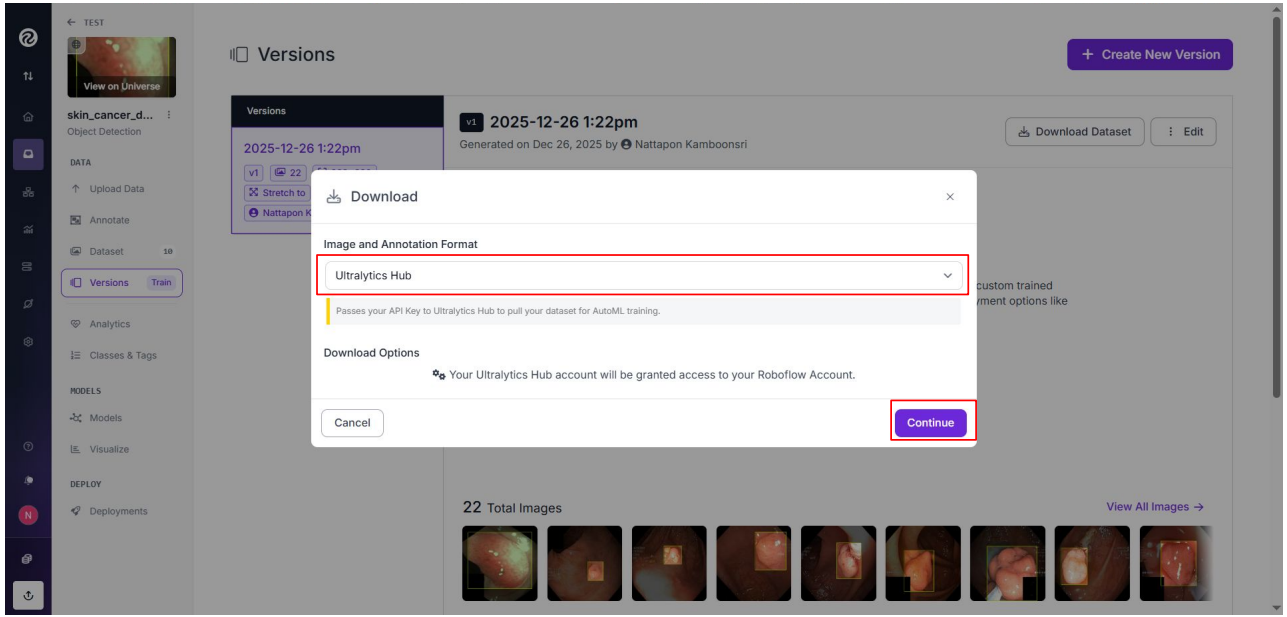
Lab6.1: Object detection dataset

6) Split Train:60%, Validation:20%, Test:20%



Lab6.1: Object detection dataset

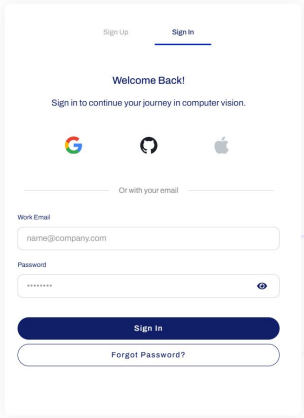
7) Download the dataset in two formats: (1) Ultralytics HUB format for training the model, and (2) YOLOv8 format for evaluation using a Google Colab notebook.

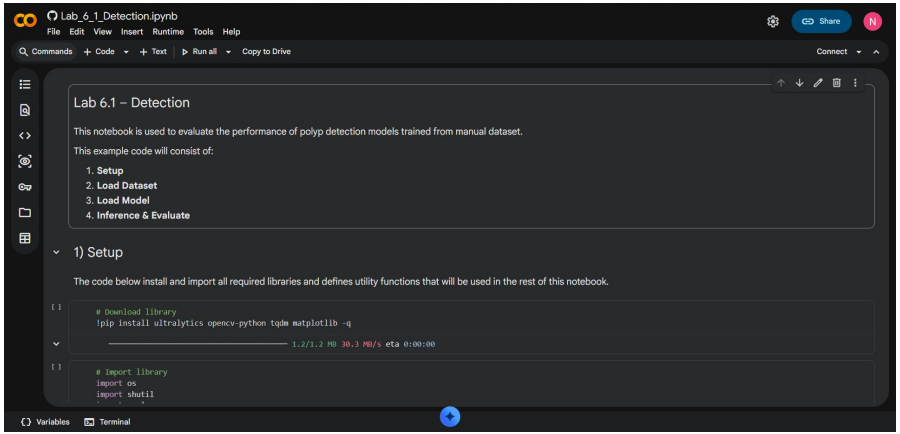


Lab6.1: Object detection dataset

8) Train YOLOv8n in Ultralytics Hub

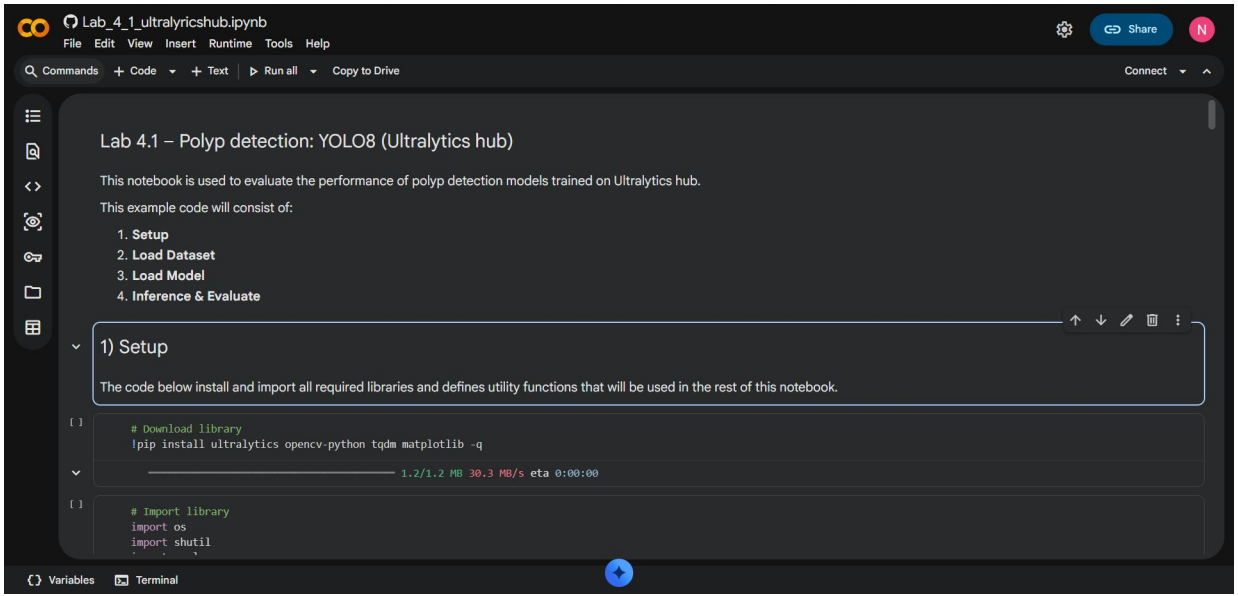
9) Load model to run in Lab_6_1_Detection (in **colab**)





Lab6.1: Object detection dataset

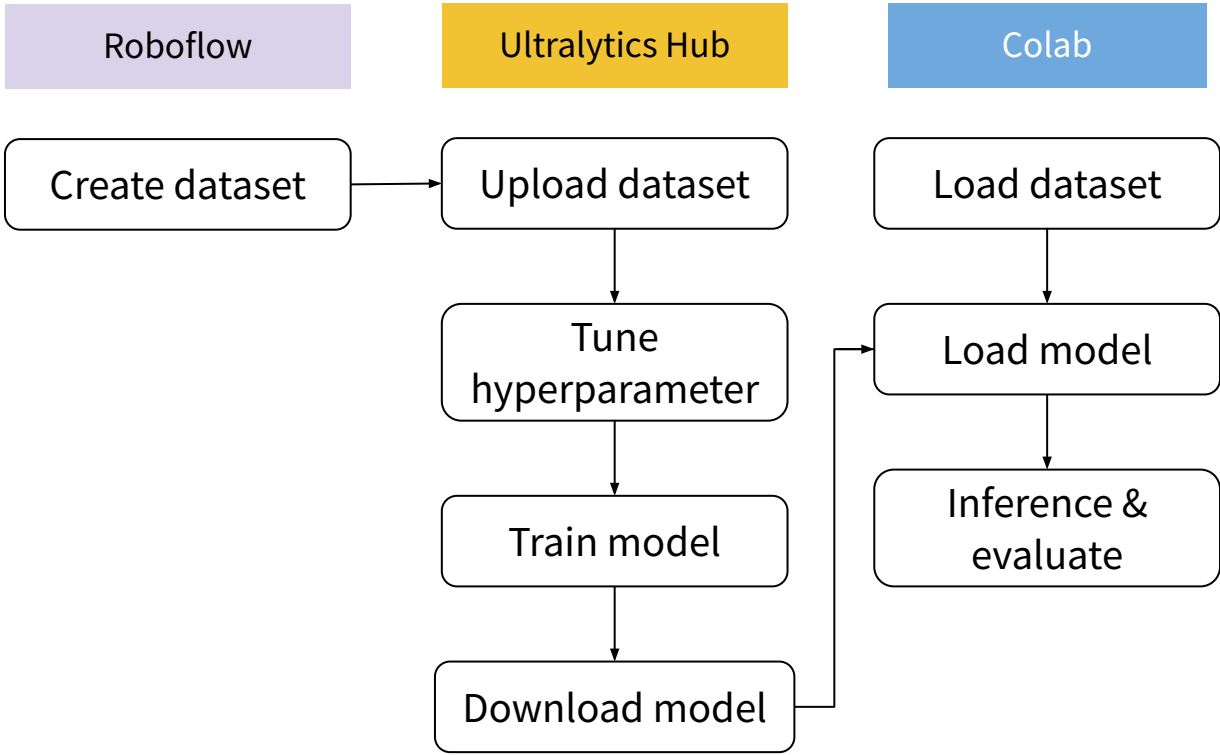
5) Open Lab_4_1_ultralyricshub (in **colab**)



Lab6.1: Object detection dataset

In this lab, we will repeat the experiment from **Lab 4.1 (YOLOv8n)**, but the dataset will be created using Roboflow instead.

1) Load image from github
2) Create Object detection dataset in Roboflow
3) Train YOLO model in ultralytics hub
4) evaluate YOLO in Lab_6_1_ultralyricshub



Lab6.2: Segmentation dataset

In this lab, we will repeat the experiment from **Lab 5.1 (2DUNet)**, but the dataset will be created using Roboflow instead.

1) Load image from GitHub
2) Create segmentation dataset in Roboflow
3) Download the dataset in segment formats
4) Upload the dataset to the Lab_6_2_Segmentation, then train and evaluate the model.