

## Model Development Phase Template

Date	15 March 2024
Team ID	739728
Project Title	YOLOChemDetect safeguarding with Automated Drug Name Detection
Maximum Marks	10 Marks

### Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary and training and validation performance metrics for multiple models, presented through respective screenshots.

### Initial Model Training Code (5 marks):



```

Drug_Detection.ipynb
File Edit View Insert Runtime Tools Help Changes will not be saved

+ Code + Text Copy to Drive

!pip install -q kaggle

[ ] from google.colab import files
files.upload()

[ ] from google.colab import drive
drive.mount('/content/drive')

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

[ ] import shutil

# Assuming the output is saved in a folder called 'runs'
# Move results to your Google Drive folder
shutil.move('/content/runs', '/content/drive/MyDrive/runs')

[ ] mkdir ~/.kaggle

mkdir: cannot create directory '/root/.kaggle': File exists

[ ] cp kaggle.json ~/.kaggle
  
```

```
[ ] lcp kaggle.json ~/.kaggle

[ ] lkaggle datasets download -d pkdarabi/The-Drug-Name-Detection-Dataset

Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /root/.kaggle/kaggle.json'
Dataset URL: https://www.kaggle.com/datasets/pkdarabi/The-Drug-Name-Detection-Dataset
License(s): Attribution 4.0 International (CC BY 4.0)
The-Drug-Name-Detection-Dataset.zip: Skipping, found more recently modified local copy (use --force to force download)

[ ] Start coding or generate with AI.

[ ] lunzip The-Drug-Name-Detection-Dataset.zip

Archive: The-Drug-Name-Detection-Dataset.zip
replace data.yaml? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
inflating: data.yaml
inflating: test/images/20230812_210244.jpg.rf.a2373a15c967eb6a157295e74fc71f45.jpg
inflating: test/images/20230812_210441.jpg.rf.304261e00a390228fdd99f23079290aa.jpg
inflating: test/images/20230812_213537.jpg.rf.ca0e0d08c6190258312e46cca65d229.jpg
inflating: test/images/20230812_214043.jpg.rf.0df6b253cf09bd47d9ffdf2f8158b5d6.jpg
inflating: test/images/20230812_215836.jpg.rf.c9608220426c128e75c907d143f77f9a.jpg
inflating: test/images/20230812_215916.jpg.rf.73cc868bb2038044a6820f8607aae04e.jpg
inflating: test/images/20230812_220455.jpg.rf.16415c5c975af2d02396f2e1957dd1e6.jpg
inflating: test/images/20230812_220806.jpg.rf.fcd789d33cef3a7206e33007a1326197.jpg
inflating: test/images/20230812_220950.jpg.rf.c777cf6714c8ca0516786538db965e15.jpg
inflating: test/images/20230812_221022.jpg.rf.ff9b48cd047470b76d559fb3ceb3b461.jpg
inflating: test/images/20230812_221206.jpg.rf.691388c7826ba7647185ea05dc8b9806.jpg
inflating: test/images/20230812_221626.jpg.rf.f59a448365cd1d23f8f7513c78824389.jpg
inflating: test/images/20230812_221708.jpg.rf.2f211999f6915c86d98eda9de7a1c5d.jpg
inflating: test/images/20230812_221804.jpg.rf.494390a32eb74ea02a25a318668790a5.jpg
```

```
[ ] lcp kaggle.json ~/.kaggle

[ ] lkaggle datasets download -d pkdarabi/The-Drug-Name-Detection-Dataset

Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /root/.kaggle/kaggle.json'
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inflating: test/images/20230812_210441.jpg.rf.304261e00a390228fdd99f23079290aa.jpg
inflating: test/images/20230812_213537.jpg.rf.ca0e0d08c6190258312e46cca65d229.jpg
inflating: test/images/20230812_214043.jpg.rf.0df6b253cf09bd47d9ffdf2f8158b5d6.jpg
inflating: test/images/20230812_215836.jpg.rf.c9608220426c128e75c907d143f77f9a.jpg
inflating: test/images/20230812_215916.jpg.rf.73cc868bb2038044a6820f8607aae04e.jpg
inflating: test/images/20230812_220455.jpg.rf.16415c5c975af2d02396f2e1957dd1e6.jpg
inflating: test/images/20230812_220806.jpg.rf.fcd789d33cef3a7206e33007a1326197.jpg
inflating: test/images/20230812_220950.jpg.rf.c777cf6714c8ca0516786538db965e15.jpg
inflating: test/images/20230812_221022.jpg.rf.ff9b48cd047470b76d559fb3ceb3b461.jpg
inflating: test/images/20230812_221206.jpg.rf.691388c7826ba7647185ea05dc8b9806.jpg
inflating: test/images/20230812_221626.jpg.rf.f59a448365cd1d23f8f7513c78824389.jpg
inflating: test/images/20230812_221708.jpg.rf.2f211999f6915c86d98eda9de7a1c5d.jpg
inflating: test/images/20230812_221804.jpg.rf.494390a32eb74ea02a25a318668790a5.jpg
```

```

] import warnings
warnings.filterwarnings('ignore')

] !pip install ultralytics --quiet

] from ultralytics import YOLO
model=YOLO('yolov8n.pt')

] Creating new ultralytics Settings v0.0.6 file
View Ultralytics Settings with 'yolo settings' or at '/root/.config/ultralytics/settings.json'
Update Settings with 'yolo settings key=value', i.e. 'yolo settings runs_dir=path/to/dir'. For help see https://docs.ultralytics.com/quickstart/#ultralytics-settings.
Downloading https://github.com/ultralytics/assets/releases/download/v8.3.0/yolov8n.pt to 'yolov8n.pt'...
100%|██████████| 6.25M/6.25M [00:00<00:00, 78.7MB/s]

] from ultralytics import YOLO
model=YOLO('yolov8n.pt')

] import os
import yaml
import glob
import random
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import torch
from ultralytics import YOLO

```

+ Code + Text Copy to Drive

Connect T4 Gemini

```

[ ] import torch
from torchvision.models.detection import fasterrcnn_resnet50_fpn
from torchvision.transforms import functional as F
from PIL import ImageDraw
from torchvision.transforms import ToTensor
from torch.utils.data import Dataset, DataLoader
from tqdm import tqdm

[ ] result = model.train(data="/content/data.yaml", epochs=50, save_period=10, seed=seed, name="yolo8n")

] Ultralytics 8.3.50 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
engine/trainer: task=detect, mode=train, model=yolov8n.pt, data=/content/data.yaml, epochs=50, time=None, patience=100, batch=16, imgs=640, save=True, save_period=10, cache=False,
Downloading https://ultralytics.com/assets/Arial.ttf to '/root/.config/ultralytics/Arial.ttf'...
100%|██████████| 755k/755k [00:00<00:00, 18.3MB/s]
Overriding model.yaml nc=80 with nc=1

      from  n  params module                                arguments
0         -1  1    464  ultralytics.nn.modules.conv.Conv      [3, 16, 3, 2]
1         -1  1   4672 ultralytics.nn.modules.conv.Conv      [16, 32, 3, 2]
2         -1  1   7360 ultralytics.nn.modules.block.C2f      [32, 32, 1, True]
3         -1  1  18560 ultralytics.nn.modules.conv.Conv      [32, 64, 3, 2]
4         -1  2  49664 ultralytics.nn.modules.block.C2f      [64, 64, 2, True]
5         -1  1  73984 ultralytics.nn.modules.conv.Conv      [64, 128, 3, 2]
6         -1  2 197632 ultralytics.nn.modules.block.C2f      [128, 128, 2, True]
7         -1  1 295424 ultralytics.nn.modules.conv.Conv      [128, 256, 3, 2]
8         -1  1 460288 ultralytics.nn.modules.block.C2f      [256, 256, 1, True]
9         -1  1 164608 ultralytics.nn.modules.block.SPPF      [256, 256, 5]
10        -1  1         0 torch.nn.modules.upsampling.Upsample      [None, 2, 'nearest']
11      [-1, 6]  1         0 ultralytics.nn.modules.conv.Concat      [1]
12        -1  1 148224 ultralytics.nn.modules.block.C2f      [384, 128, 1]
13        -1  1         0 torch.nn.modules.upsampling.Upsample      [None, 2, 'nearest']
14      [-1, 4]  1         0 ultralytics.nn.modules.conv.Concat      [1]
15        -1  1  37248 ultralytics.nn.modules.block.C2f      [192, 64, 1]

```

## Model Validation and Evaluation Report (5 marks):

Model	Summary	Training and Validation Performance Metrics
YOLOV8N	<pre> 36 epochs completed in 0.450 hours. optimizer stripped from runs/object/yolov8n/weights/last.pt, 4.29M optimizer stripped from runs/object/yolov8n/weights/best.pt, 4.29M Validating runs/object/yolov8n/weights/best.pt... Ultralytics 8.3.58 Python 3.10.12 torch 2.5.1+cu121 CUDA:0 (Tesla T4, 15102MiB) Model Summary (ncnn): 168 layers, 1.6M, 1.6M parameters, 0 gradients, 8.1 GFLOPs Class      Images  Instances  BoxP  R      mAP0.5  mAP0.5:1000 all        364      8758      0.62  0.97  0.97    0.427 Speed: 6.3ms preprocess, 2.0ms inference, 8.8ms loss, 3.0ms postprocess per image Results saved in runs/object/yolov8n </pre>	Screenshot of the training and validation performance metrics (output of the model.fit()).