

# Project: Skin Disease Recognition System Generation Using Models

## 1. Preparing the Data

### A. Image Source:

#### ISIC-Archive:

Data are bound to the ISIC-Archive rights

(<https://www.isic-archive.com/#!/topWithHeader/wideContentTop/main>).

The DataSet was the part of Ham10000.

### B. Data Structure:

Initially, the image data is available in two separate folders. For convenience, these images are moved to a single folder called **Ham100**.

Additionally, there is a CSV file named **Ham100.csv**, which contains metadata about each image in the dataset, such as lesion type, diagnosis, and other relevant information.

```
#1 Mounting DRIVE TO LOAD THE DATA SET
```

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

```
Mounted at /content/drive
```

1.1\_ **Extracting** The ISIC-Archive(part containing Malignant vs. Benign class) data zip file and storing them into a new File.

```
#file extraction
import zipfile
file1_ref=zipfile.ZipFile('/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/archive (3).zip','r')
file1_ref.extractall('/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet')
file1_ref.close()
```

```
Data Structure :
DataSet/
```

```
├── train/
│   ├── Benign/
│   │   ├── image1.jpg
│   │   └── image2.jpg
│   └── Malignant/
│       ├── image3.jpg
│       └── image4.jpg
└── test/
    ├── Benign/
    │   └── image5.jpg
    └── Malignant/
        └── image6.jpg
```

## ***2. Exploratory Data Analysis (EDA)***

It is all done And Displayed in the Skin\_Disease\_Manual lab

## ***3. Model Building by Approach of using Models***

```
# Install Required Libraries
```

```
!pip install ultralytics
```

```
Collecting ultralytics
```

```
  Downloading ultralytics-8.3.59-py3-none-any.whl.metadata (35 kB)
```

```
Requirement already satisfied: numpy>=1.23.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (1.26.4)
```

```
Requirement already satisfied: matplotlib>=3.3.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (3.10.0)
```

```
Requirement already satisfied: opencv-python>=4.6.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (4.10.0.84)
```

```
Requirement already satisfied: pillow>=7.1.2 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (11.1.0)
```

```
Requirement already satisfied: pyyaml>=5.3.1 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (6.0.2)
```

```
Requirement already satisfied: requests>=2.23.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (2.32.3)
```

```
Requirement already satisfied: scipy>=1.4.1 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (1.13.1)
```

```
Requirement already satisfied: torch>=1.8.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics)
```

```
(2.5.1+cu121)
```

```
Requirement already satisfied: torchvision>=0.9.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics)
```

```
(0.20.1+cu121)
```

```
Requirement already satisfied: tqdm>=4.64.0 in
```

```
/usr/local/lib/python3.10/dist-packages (from ultralytics) (4.67.1)
```

Requirement already satisfied: psutil in  
/usr/local/lib/python3.10/dist-packages (from ultralytics) (5.9.5)  
Requirement already satisfied: py-cpuinfo in  
/usr/local/lib/python3.10/dist-packages (from ultralytics) (9.0.0)  
Requirement already satisfied: pandas>=1.1.4 in  
/usr/local/lib/python3.10/dist-packages (from ultralytics) (2.2.2)  
Requirement already satisfied: seaborn>=0.11.0 in  
/usr/local/lib/python3.10/dist-packages (from ultralytics) (0.13.2)  
Collecting ultralytics-thop>=2.0.0 (from ultralytics)  
 Downloading ultralytics\_thop-2.0.13-py3-none-any.whl.metadata (9.4  
kB)  
Requirement already satisfied: contourpy>=1.0.1 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (1.3.1)  
Requirement already satisfied: cycler>=0.10 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (0.12.1)  
Requirement already satisfied: fonttools>=4.22.0 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (4.55.3)  
Requirement already satisfied: kiwisolver>=1.3.1 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (1.4.8)  
Requirement already satisfied: packaging>=20.0 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (24.2)  
Requirement already satisfied: pyparsing>=2.3.1 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (3.2.1)  
Requirement already satisfied: python-dateutil>=2.7 in  
/usr/local/lib/python3.10/dist-packages (from matplotlib>=3.3.0-  
>ultralytics) (2.8.2)  
Requirement already satisfied: pytz>=2020.1 in  
/usr/local/lib/python3.10/dist-packages (from pandas>=1.1.4-  
>ultralytics) (2024.2)  
Requirement already satisfied: tzdata>=2022.7 in  
/usr/local/lib/python3.10/dist-packages (from pandas>=1.1.4-  
>ultralytics) (2024.2)  
Requirement already satisfied: charset-normalizer<4,>=2 in  
/usr/local/lib/python3.10/dist-packages (from requests>=2.23.0-  
>ultralytics) (3.4.1)  
Requirement already satisfied: idna<4,>=2.5 in  
/usr/local/lib/python3.10/dist-packages (from requests>=2.23.0-  
>ultralytics) (3.10)  
Requirement already satisfied: urllib3<3,>=1.21.1 in  
/usr/local/lib/python3.10/dist-packages (from requests>=2.23.0-  
>ultralytics) (2.3.0)  
Requirement already satisfied: certifi>=2017.4.17 in  
/usr/local/lib/python3.10/dist-packages (from requests>=2.23.0-

```
>ultralitics) (2024.12.14)
Requirement already satisfied: filelock in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (3.16.1)
Requirement already satisfied: typing-extensions>=4.8.0 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (4.12.2)
Requirement already satisfied: networkx in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (3.4.2)
Requirement already satisfied: jinja2 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (3.1.5)
Requirement already satisfied: fsspec in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (2024.10.0)
Requirement already satisfied: sympy==1.13.1 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.8.0-
>ultralitics) (1.13.1)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in
/usr/local/lib/python3.10/dist-packages (from sympy==1.13.1-
>torch>=1.8.0->ultralitics) (1.3.0)
Requirement already satisfied: six>=1.5 in
/usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7-
>matplotlib>=3.3.0->ultralitics) (1.17.0)
Requirement already satisfied: MarkupSafe>=2.0 in
/usr/local/lib/python3.10/dist-packages (from jinja2->torch>=1.8.0-
>ultralitics) (3.0.2)
Downloading ultralitics-8.3.59-py3-none-any.whl (906 kB)
----- 906.8/906.8 kB 23.0 MB/s eta
0:00:00
```

### # 3.2 Import Libraries

```
import os
import numpy as np
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, GlobalAveragePooling2D
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.applications import ResNet50
from ultralitics import YOLO
```

```
Creating new Ultralitics Settings v0.0.6 file []
View Ultralitics Settings with 'yolo settings' or at
'/root/.config/Ultralitics/settings.json'
Update Settings with 'yolo settings key=value', i.e. 'yolo settings
runs_dir=path/to/dir'. For help see
https://docs.ultralitics.com/quickstart/#ultralitics-settings.
```

### # 3.3 Verify Dataset Structure

```
print("Train Classes:", os.listdir('/content/drive/MyDrive/Deep
```

```

Learning/Skin_Classi_Final_Project/DataSet/train'))
print("Test Classes:", os.listdir('/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test'))
train='/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/train'
test='/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test'

Train Classes: ['benign', 'malignant']
Test Classes: ['benign', 'malignant']

# Step 3.4: Data Augmentation
train_datagen = ImageDataGenerator(
    rescale=1./255,
    rotation_range=20,
    width_shift_range=0.2,
    height_shift_range=0.2,
    shear_range=0.2,
    zoom_range=0.2,
    horizontal_flip=True
)

test_datagen = ImageDataGenerator(rescale=1./255)

train_generator = train_datagen.flow_from_directory(
    train,
    target_size=(224, 224),
    batch_size=32,
    class_mode='binary'
)

test_generator = test_datagen.flow_from_directory(
    test,
    target_size=(224, 224),
    batch_size=32,
    class_mode='binary'
)

Found 2637 images belonging to 2 classes.
Found 660 images belonging to 2 classes.

# Step 3.5 : Train YOLOv8 for Classification
print("Training YOLOv8 Classification...")
model_yolo = YOLO('yolov8n-cls') # Nano model for classification
model_yolo.train(data='/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet', epochs=50, imgsz=224,
batch=32)

Training YOLOv8 Classification...
Downloading

```

<https://github.com/ultralytics/assets/releases/download/v8.3.0/yolov8n-cls.pt> to 'yolov8n-cls.pt'...

100%|██████████| 5.31M/5.31M [00:00<00:00, 98.7MB/s]

Ultralytics 8.3.59 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla T4, 15102MiB)

engine/trainer: task=classify, mode=train, model=yolov8n-cls.pt, data=/content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet, epochs=50, time=None, patience=100, batch=32, imgsz=224, save=True, save\_period=-1, cache=False, device=None, workers=8, project=None, name=train, exist\_ok=False, pretrained=True, optimizer=auto, verbose=True, seed=0, deterministic=True, single\_cls=False, rect=False, cos\_lr=False, close\_mosaic=10, resume=False, amp=True, fraction=1.0, profile=False, freeze=None, multi\_scale=False, overlap\_mask=True, mask\_ratio=4, dropout=0.0, val=True, split=val, save\_json=False, save\_hybrid=False, conf=None, iou=0.7, max\_det=300, half=False, dnn=False, plots=True, source=None, vid\_stride=1, stream\_buffer=False, visualize=False, augment=False, agnostic\_nms=False, classes=None, retina\_masks=False, embed=None, show=False, save\_frames=False, save\_txt=False, save\_conf=False, save\_crop=False, show\_labels=True, show\_conf=True, show\_boxes=True, line\_width=None, format=torchscript, keras=False, optimize=False, int8=False, dynamic=False, simplify=True, opset=None, workspace=None, nms=False, lr0=0.01, lrf=0.01, momentum=0.937, weight\_decay=0.0005, warmup\_epochs=3.0, warmup\_momentum=0.8, warmup\_bias\_lr=0.1, box=7.5, cls=0.5, dfl=1.5, pose=12.0, kobj=1.0, nbs=64, hsv\_h=0.015, hsv\_s=0.7, hsv\_v=0.4, degrees=0.0, translate=0.1, scale=0.5, shear=0.0, perspective=0.0, flipud=0.0, fliplr=0.5, bgr=0.0, mosaic=1.0, mixup=0.0, copy\_paste=0.0, copy\_paste\_mode=flip, auto\_augment=randaugment, erasing=0.4, crop\_fraction=1.0, cfg=None, tracker=botsort.yaml, save\_dir=runs/classify/train

train: /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/train... found 2637 images in 2 classes

val: None...

test: /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test... found 660 images in 2 classes

Overriding model.yaml nc=1000 with nc=2

	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     332802
ultralytics.nn.modules.head.Classify [256, 2]

```

YOLOv8n-cls summary: 99 layers, 1,440,850 parameters, 1,440,850 gradients, 3.4 GFLOPs

Transferred 156/158 items from pretrained weights

TensorBoard: Start with 'tensorboard --logdir runs/classify/train', view at <http://localhost:6006/>

AMP: running Automatic Mixed Precision (AMP) checks...

Downloading

<https://github.com/ultralytics/assets/releases/download/v8.3.0/yololln.pt> to 'yololln.pt'...

100%|██████████| 5.35M/5.35M [00:00<00:00, 109MB/s]

AMP: checks passed ☐

train: Scanning /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/train... 2637 images, 0

corrupt: 100%|██████████| 2637/2637 [00:00<?, ?it/s]

val: Scanning /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test... 660 images, 0

corrupt: 100%|██████████| 660/660 [00:00<?, ?it/s]

optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr0' and 'momentum' automatically...

optimizer: AdamW(lr=0.000714, momentum=0.9) with parameter groups 26 weight(decay=0.0), 27 weight(decay=0.0005), 27 bias(decay=0.0)

TensorBoard: model graph visualization added ☐

Image sizes 224 train, 224 val

Using 2 dataloader workers

Logging results to runs/classify/train

Starting training for 50 epochs...

Epoch	GPU_mem	loss	Instances	Size
1/50	0.415G	0.7055	32	224: 1%
1/83 [00:13<18:17, 13.39s/it]				

Downloading <https://ultralytics.com/assets/Arial.ttf> to  
'/root/.config/Ultralytics/Arial.ttf'...

100%|██████████| 755k/755k [00:00<00:00, 22.7MB/s]  
1/50 0.417G 0.5463 13 224: 100%|██████████|  
██████████| 83/83 [08:53<00:00, 6.42s/it]  
classes top1\_acc top5\_acc: 100%|██████████| 11/11  
[00:45<00:00, 4.11s/it]  
all 0.788 1

Epoch	GPU_mem	loss	Instances	Size
2/50	0.392G	0.3986	13	224: 100% ██████████
██████████	83/83 [00:26<00:00, 3.10it/s]	classes top1_acc top5_acc: 100% ██████████	11/11	
	[00:03<00:00, 3.22it/s]			
all	0.85	1		

Epoch	GPU_mem	loss	Instances	Size
3/50	0.394G	0.3564	13	224: 100% ██████████
██████████	83/83 [00:27<00:00, 2.97it/s]	classes top1_acc top5_acc: 100% ██████████	11/11	
	[00:03<00:00, 3.23it/s]			
all	0.818	1		

Epoch	GPU_mem	loss	Instances	Size
4/50	0.392G	0.3255	13	224: 100% ██████████
██████████	83/83 [00:27<00:00, 2.97it/s]	classes top1_acc top5_acc: 100% ██████████	11/11	
	[00:03<00:00, 3.18it/s]			
all	0.865	1		

Epoch	GPU_mem	loss	Instances	Size
-------	---------	------	-----------	------



```
5/50      0.401G      0.3221      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.87it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.19it/s]
```

```
all      0.858      1
```

```
Epoch    GPU_mem      loss  Instances      Size
6/50      0.392G      0.2972      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.93it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.42it/s]
```

```
all      0.873      1
```

```
Epoch    GPU_mem      loss  Instances      Size
7/50      0.401G      0.2667      13      224: 100%|
██████████| 83/83 [00:29<00:00, 2.85it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.24it/s]
```

```
all      0.85      1
```

```
Epoch    GPU_mem      loss  Instances      Size
8/50      0.392G      0.2534      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.87it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.32it/s]
```

```
all      0.885      1
```

```
Epoch    GPU_mem      loss  Instances      Size
9/50      0.401G      0.2661      13      224: 100%|
██████████| 83/83 [00:29<00:00, 2.85it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.39it/s]
```

```
all      0.88      1
```

Epoch	GPU_mem	loss	Instances	Size
10/50	0.392G	0.2327	13	224: 100%
██████████	83/83 [00:28<00:00, 2.91it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.23it/s]			
	all	0.885	1	

Epoch	GPU_mem	loss	Instances	Size
11/50	0.401G	0.2477	13	224: 100%
██████████	83/83 [00:28<00:00, 2.90it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.19it/s]			
	all	0.874	1	

Epoch	GPU_mem	loss	Instances	Size
12/50	0.392G	0.2353	13	224: 100%
██████████	83/83 [00:28<00:00, 2.89it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.21it/s]			
	all	0.891	1	

Epoch	GPU_mem	loss	Instances	Size
13/50	0.401G	0.2058	13	224: 100%
██████████	83/83 [00:28<00:00, 2.88it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.50it/s]			
	all	0.892	1	

Epoch	GPU_mem	loss	Instances	Size
-------	---------	------	-----------	------

```
14/50      0.392G      0.2357      13      224: 100%|
██████████| 83/83 [00:29<00:00, 2.83it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.31it/s]
```

```
all      0.885      1
```

```
Epoch      GPU_mem      loss  Instances      Size
15/50      0.401G      0.2034      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.88it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.26it/s]
```

```
all      0.882      1
```

```
Epoch      GPU_mem      loss  Instances      Size
16/50      0.392G      0.1943      13      224: 100%|
██████████| 83/83 [00:29<00:00, 2.86it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.38it/s]
```

```
all      0.892      1
```

```
Epoch      GPU_mem      loss  Instances      Size
17/50      0.401G      0.1897      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.89it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.21it/s]
```

```
all      0.903      1
```

```
Epoch      GPU_mem      loss  Instances      Size
18/50      0.392G      0.192      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.92it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.36it/s]
```

```
all      0.892      1
```

Epoch	GPU_mem	loss	Instances	Size
19/50	0.401G	0.1841	13	224: 100%
██████████	83/83 [00:28<00:00, 2.88it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.13it/s]			
	all	0.879	1	

Epoch	GPU_mem	loss	Instances	Size
20/50	0.392G	0.1752	13	224: 100%
██████████	83/83 [00:29<00:00, 2.84it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.27it/s]			
	all	0.876	1	

Epoch	GPU_mem	loss	Instances	Size
21/50	0.401G	0.1782	13	224: 100%
██████████	83/83 [00:28<00:00, 2.90it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.18it/s]			
	all	0.897	1	

Epoch	GPU_mem	loss	Instances	Size
22/50	0.392G	0.1671	13	224: 100%
██████████	83/83 [00:28<00:00, 2.90it/s]			
	classes top1_acc top5_acc: 100%			██████████ 11/11
	[00:03<00:00, 3.26it/s]			
	all	0.897	1	

Epoch	GPU_mem	loss	Instances	Size
-------	---------	------	-----------	------

```
23/50      0.401G      0.1521      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.91it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.26it/s]
```

```
all      0.888      1
```

```
Epoch      GPU_mem      loss  Instances      Size
24/50      0.392G      0.1601      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.92it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.08it/s]
```

```
all      0.88      1
```

```
Epoch      GPU_mem      loss  Instances      Size
25/50      0.401G      0.1482      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.92it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 2.98it/s]
```

```
all      0.888      1
```

```
Epoch      GPU_mem      loss  Instances      Size
26/50      0.392G      0.1441      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.95it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.64it/s]
```

```
all      0.897      1
```

```
Epoch      GPU_mem      loss  Instances      Size
27/50      0.401G      0.1424      13      224: 100%|
██████████| 83/83 [00:27<00:00, 3.00it/s]
          classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.37it/s]
```

```
all      0.888      1
```

Epoch	GPU_mem	loss	Instances	Size
28/50	0.392G	0.1479	13	224: 100%
██████████	83/83 [00:27<00:00, 3.05it/s]			
	classes top1_acc top5_acc: 100%	██████████	11/11	
	[00:04<00:00, 2.37it/s]			
	all	0.892	1	

Epoch	GPU_mem	loss	Instances	Size
29/50	0.401G	0.1256	13	224: 100%
██████████	83/83 [00:26<00:00, 3.08it/s]			
	classes top1_acc top5_acc: 100%	██████████	11/11	
	[00:04<00:00, 2.28it/s]			
	all	0.898	1	

Epoch	GPU_mem	loss	Instances	Size
30/50	0.392G	0.1246	13	224: 100%
██████████	83/83 [00:26<00:00, 3.09it/s]			
	classes top1_acc top5_acc: 100%	██████████	11/11	
	[00:05<00:00, 2.18it/s]			
	all	0.873	1	

Epoch	GPU_mem	loss	Instances	Size
31/50	0.401G	0.1336	13	224: 100%
██████████	83/83 [00:26<00:00, 3.11it/s]			
	classes top1_acc top5_acc: 100%	██████████	11/11	
	[00:05<00:00, 2.10it/s]			
	all	0.897	1	

Epoch	GPU_mem	loss	Instances	Size
-------	---------	------	-----------	------

```
32/50      0.392G      0.1309      13      224: 100%|
██████████| 83/83 [00:26<00:00, 3.17it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.26it/s]
```

```
all      0.895      1
```

```
Epoch      GPU_mem      loss  Instances      Size
33/50      0.401G      0.112      13      224: 100%|
██████████| 83/83 [00:26<00:00, 3.11it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:05<00:00, 2.19it/s]
```

```
all      0.886      1
```

```
Epoch      GPU_mem      loss  Instances      Size
34/50      0.392G      0.1234      13      224: 100%|
██████████| 83/83 [00:26<00:00, 3.12it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.40it/s]
```

```
all      0.892      1
```

```
Epoch      GPU_mem      loss  Instances      Size
35/50      0.401G      0.1135      13      224: 100%|
██████████| 83/83 [00:26<00:00, 3.13it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.69it/s]
```

```
all      0.892      1
```

```
Epoch      GPU_mem      loss  Instances      Size
36/50      0.392G      0.09729      13      224: 100%|
██████████| 83/83 [00:26<00:00, 3.10it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:04<00:00, 2.55it/s]
```

```
all      0.895      1
```

Epoch	GPU_mem	loss	Instances	Size
37/50	0.401G	0.1093	13	224: 100%
██████████	83/83 [00:26<00:00, 3.08it/s]			
	classes	top1_acc	top5_acc: 100%	██████████ 11/11
	[00:03<00:00, 2.90it/s]			
	all	0.889	1	

Epoch	GPU_mem	loss	Instances	Size
38/50	0.392G	0.1057	13	224: 100%
██████████	83/83 [00:27<00:00, 3.03it/s]			
	classes	top1_acc	top5_acc: 100%	██████████ 11/11
	[00:03<00:00, 2.93it/s]			
	all	0.885	1	

Epoch	GPU_mem	loss	Instances	Size
39/50	0.401G	0.1047	13	224: 100%
██████████	83/83 [00:27<00:00, 3.04it/s]			
	classes	top1_acc	top5_acc: 100%	██████████ 11/11
	[00:03<00:00, 2.82it/s]			
	all	0.9	1	

Epoch	GPU_mem	loss	Instances	Size
40/50	0.392G	0.0935	13	224: 100%
██████████	83/83 [00:27<00:00, 2.97it/s]			
	classes	top1_acc	top5_acc: 100%	██████████ 11/11
	[00:03<00:00, 3.06it/s]			
	all	0.902	1	

Epoch	GPU_mem	loss	Instances	Size
41/50	0.401G	0.09731	13	224: 100%
██████████	83/83 [00:29<00:00, 2.82it/s]			
	classes	top1_acc	top5_acc: 100%	██████████ 11/11
	[00:03<00:00, 2.91it/s]			



	all	0.9	1	
Epoch	GPU_mem	loss	Instances	Size
42/50	0.392G	0.08222	13	224: 100%
██████████	83/83 [00:26<00:00,	3.08it/s]		
	classes	top1_acc	top5_acc: 100%	██████████  11/11
	[00:03<00:00,	2.93it/s]		
	all	0.897	1	
Epoch	GPU_mem	loss	Instances	Size
43/50	0.401G	0.09192	13	224: 100%
██████████	83/83 [00:27<00:00,	2.97it/s]		
	classes	top1_acc	top5_acc: 100%	██████████  11/11
	[00:03<00:00,	3.08it/s]		
	all	0.897	1	
Epoch	GPU_mem	loss	Instances	Size
44/50	0.392G	0.09372	13	224: 100%
██████████	83/83 [00:28<00:00,	2.96it/s]		
	classes	top1_acc	top5_acc: 100%	██████████  11/11
	[00:03<00:00,	3.40it/s]		
	all	0.902	1	
Epoch	GPU_mem	loss	Instances	Size
45/50	0.401G	0.08405	13	224: 100%
██████████	83/83 [00:28<00:00,	2.89it/s]		
	classes	top1_acc	top5_acc: 100%	██████████  11/11
	[00:03<00:00,	3.32it/s]		
	all	0.894	1	
Epoch	GPU_mem	loss	Instances	Size

```
46/50      0.392G      0.08715      13      224: 100%|
██████████| 83/83 [00:27<00:00, 2.97it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.17it/s]
```

```
all      0.892      1
```

```
Epoch      GPU_mem      loss  Instances      Size
47/50      0.401G      0.08381      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.95it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.11it/s]
```

```
all      0.897      1
```

```
Epoch      GPU_mem      loss  Instances      Size
48/50      0.392G      0.07627      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.91it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.27it/s]
```

```
all      0.895      1
```

```
Epoch      GPU_mem      loss  Instances      Size
49/50      0.401G      0.09602      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.87it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.20it/s]
```

```
all      0.898      1
```

```
Epoch      GPU_mem      loss  Instances      Size
50/50      0.392G      0.07804      13      224: 100%|
██████████| 83/83 [00:28<00:00, 2.89it/s]
           classes top1_acc top5_acc: 100%|██████████| 11/11
[00:03<00:00, 3.16it/s]
```

```
all      0.891      1
```

```

50 epochs completed in 0.607 hours.
Optimizer stripped from runs/classify/train/weights/last.pt, 3.0MB
Optimizer stripped from runs/classify/train/weights/best.pt, 3.0MB

Validating runs/classify/train/weights/best.pt...
Ultralytics 8.3.59 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla
T4, 15102MiB)
YOLOv8n-cls summary (fused): 73 layers, 1,437,442 parameters, 0
gradients, 3.3 GFLOPs
WARNING ⚠ Dataset 'split=val' not found, using 'split=test' instead.
train: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/train... found 2637 images
in 2 classes
val: None...
test: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test... found 660 images in
2 classes

      classes  top1_acc  top5_acc: 100%|██████████| 11/11
[00:05<00:00, 2.05it/s]

      all      0.902      1
Speed: 0.1ms preprocess, 0.2ms inference, 0.0ms loss, 0.0ms
postprocess per image
Results saved to runs/classify/train

ultralytics.utils.metrics.ClassifyMetrics object with attributes:

confusion_matrix: <ultralytics.utils.metrics.ConfusionMatrix object at
0x79ddb03746d0>
curves: []
curves_results: []
fitness: 0.9507575631141663
keys: ['metrics/accuracy_top1', 'metrics/accuracy_top5']
results_dict: {'metrics/accuracy_top1': 0.9015151262283325,
'metrics/accuracy_top5': 1.0, 'fitness': 0.9507575631141663}
save_dir: PosixPath('runs/classify/train')
speed: {'preprocess': 0.07812832341049657, 'inference':
0.2387787356521144, 'loss': 0.0002517844691421047, 'postprocess':
0.0003814697265625}
task: 'classify'
top1: 0.9015151262283325
top5: 1.0

# Step 3.7: Evaluate Yolo Model
print("Evaluating YOLOv8 Model...")
metrics_yolo = model_yolo.val(data='/content/drive/MyDrive/Deep

```

```

Learning/Skin_Classi_Final_Project/DataSet', split='test')
print("YOLOv8 Metrics:", metrics_yolo)

Evaluating YOLOv8 Model...
Ultralytics 8.3.59 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla
T4, 15102MiB)
YOLOv8n-cls summary (fused): 73 layers, 1,437,442 parameters, 0
gradients, 3.3 GFLOPs
train: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/train... found 2637 images
in 2 classes
val: None...
test: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test... found 660 images in
2 classes

test: Scanning /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test... 660 images, 0
corrupt: 100%|██████████| 660/660 [00:00<?, ?it/s]
          classes top1_acc top5_acc: 100%|██████████| 21/21
[00:05<00:00, 4.17it/s]

          all      0.902      1
Speed: 0.1ms preprocess, 0.5ms inference, 0.0ms loss, 0.0ms
postprocess per image
Results saved to runs/classify/train2
YOLOv8 Metrics: ultralytics.utils.metrics.ClassifyMetrics object with
attributes:

confusion_matrix: <ultralytics.utils.metrics.ConfusionMatrix object at
0x79dd325a0af0>
curves: []
curves_results: []
fitness: 0.9507575631141663
keys: ['metrics/accuracy_top1', 'metrics/accuracy_top5']
results_dict: {'metrics/accuracy_top1': 0.9015151262283325,
'metrics/accuracy_top5': 1.0, 'fitness': 0.9507575631141663}
save_dir: PosixPath('runs/classify/train2')
speed: {'preprocess': 0.0629977746443315, 'inference':
0.4507696989810828, 'loss': 0.0005252433545661695, 'postprocess':
0.0013282804778127959}
task: 'classify'
top1: 0.9015151262283325
top5: 1.0

# Step 3.9: Train ResNet50 Model
print("Training ResNet50 Classification...")
base_model = ResNet50(weights='imagenet', include_top=False,
input_shape=(224, 224, 3))
base_model.trainable = False # Freeze base model layers

```

```

model_resnet = Sequential([
    base_model,
    GlobalAveragePooling2D(),
    Dense(128, activation='relu'),
    Dense(1, activation='sigmoid') # Binary classification
])

model_resnet.compile(optimizer='adam', loss='binary_crossentropy',
metrics=['accuracy'])

history_resnet = model_resnet.fit(
    train_generator,
    epochs=50,
    validation_data=test_generator
)

```

Training ResNet50 Classification...

Downloading data from [https://storage.googleapis.com/tensorflow/keras-applications/resnet/resnet50\\_weights\\_tf\\_dim\\_ordering\\_tf\\_kernels\\_notop.h5](https://storage.googleapis.com/tensorflow/keras-applications/resnet/resnet50_weights_tf_dim_ordering_tf_kernels_notop.h5)  
94765736/94765736 ————— 0s 0us/step  
Epoch 1/50

/usr/local/lib/python3.10/dist-packages/keras/src/trainers/data\_adapters/py\_dataset\_adapter.py:122: UserWarning: Your `PyDataset` class should call `super().\_\_init\_\_(\*\*kwargs)` in its constructor. `\*\*kwargs` can include `workers`, `use\_multiprocessing`, `max\_queue\_size`. Do not pass these arguments to `fit()`, as they will be ignored.

self.\_warn\_if\_super\_not\_called()

83/83 ————— 75s 697ms/step - accuracy: 0.5417 - loss: 0.7119 - val\_accuracy: 0.5485 - val\_loss: 0.6885  
Epoch 2/50

83/83 ————— 47s 533ms/step - accuracy: 0.5562 - loss: 0.6800 - val\_accuracy: 0.7212 - val\_loss: 0.6606  
Epoch 3/50

83/83 ————— 83s 537ms/step - accuracy: 0.5782 - loss: 0.6795 - val\_accuracy: 0.6788 - val\_loss: 0.6441  
Epoch 4/50

83/83 ————— 49s 544ms/step - accuracy: 0.5545 - loss: 0.6814 - val\_accuracy: 0.6152 - val\_loss: 0.6371  
Epoch 5/50

83/83 ————— 81s 546ms/step - accuracy: 0.6457 - loss: 0.6400 - val\_accuracy: 0.6758 - val\_loss: 0.6234  
Epoch 6/50

83/83 ————— 49s 553ms/step - accuracy: 0.6486 - loss: 0.6381 - val\_accuracy: 0.5697 - val\_loss: 0.6989  
Epoch 7/50

83/83 ————— 49s 550ms/step - accuracy: 0.5929 - loss: 0.6606 - val\_accuracy: 0.6712 - val\_loss: 0.6078  
Epoch 8/50  
83/83 ————— 82s 551ms/step - accuracy: 0.6316 - loss: 0.6347 - val\_accuracy: 0.7015 - val\_loss: 0.6012  
Epoch 9/50  
83/83 ————— 81s 543ms/step - accuracy: 0.6145 - loss: 0.6488 - val\_accuracy: 0.7333 - val\_loss: 0.6123  
Epoch 10/50  
83/83 ————— 48s 545ms/step - accuracy: 0.6997 - loss: 0.6075 - val\_accuracy: 0.7197 - val\_loss: 0.6163  
Epoch 11/50  
83/83 ————— 83s 547ms/step - accuracy: 0.6591 - loss: 0.6165 - val\_accuracy: 0.7258 - val\_loss: 0.5825  
Epoch 12/50  
83/83 ————— 50s 565ms/step - accuracy: 0.6950 - loss: 0.5929 - val\_accuracy: 0.7121 - val\_loss: 0.5661  
Epoch 13/50  
83/83 ————— 82s 554ms/step - accuracy: 0.6617 - loss: 0.6087 - val\_accuracy: 0.6879 - val\_loss: 0.5708  
Epoch 14/50  
83/83 ————— 49s 540ms/step - accuracy: 0.6746 - loss: 0.6015 - val\_accuracy: 0.7015 - val\_loss: 0.5577  
Epoch 15/50  
83/83 ————— 51s 558ms/step - accuracy: 0.6860 - loss: 0.5943 - val\_accuracy: 0.7485 - val\_loss: 0.5624  
Epoch 16/50  
83/83 ————— 80s 561ms/step - accuracy: 0.7172 - loss: 0.5548 - val\_accuracy: 0.7136 - val\_loss: 0.5432  
Epoch 17/50  
83/83 ————— 83s 548ms/step - accuracy: 0.7056 - loss: 0.5753 - val\_accuracy: 0.6576 - val\_loss: 0.6405  
Epoch 18/50  
83/83 ————— 81s 562ms/step - accuracy: 0.7425 - loss: 0.5602 - val\_accuracy: 0.7227 - val\_loss: 0.5315  
Epoch 19/50  
83/83 ————— 50s 560ms/step - accuracy: 0.7139 - loss: 0.5634 - val\_accuracy: 0.7500 - val\_loss: 0.5559  
Epoch 20/50  
83/83 ————— 49s 549ms/step - accuracy: 0.6974 - loss: 0.5799 - val\_accuracy: 0.7455 - val\_loss: 0.5685  
Epoch 21/50  
83/83 ————— 83s 536ms/step - accuracy: 0.7212 - loss: 0.5365 - val\_accuracy: 0.7061 - val\_loss: 0.5329  
Epoch 22/50  
83/83 ————— 49s 537ms/step - accuracy: 0.7425 - loss: 0.5201 - val\_accuracy: 0.7470 - val\_loss: 0.5179  
Epoch 23/50  
83/83 ————— 49s 544ms/step - accuracy: 0.7320 - loss:

0.5420 - val\_accuracy: 0.7121 - val\_loss: 0.5389  
Epoch 24/50  
83/83 \_\_\_\_\_ 49s 551ms/step - accuracy: 0.7145 - loss: 0.5518 - val\_accuracy: 0.7621 - val\_loss: 0.5157  
Epoch 25/50  
83/83 \_\_\_\_\_ 49s 560ms/step - accuracy: 0.7429 - loss: 0.5204 - val\_accuracy: 0.7061 - val\_loss: 0.5238  
Epoch 26/50  
83/83 \_\_\_\_\_ 51s 575ms/step - accuracy: 0.7310 - loss: 0.5386 - val\_accuracy: 0.7470 - val\_loss: 0.5677  
Epoch 27/50  
83/83 \_\_\_\_\_ 48s 545ms/step - accuracy: 0.7206 - loss: 0.5481 - val\_accuracy: 0.7136 - val\_loss: 0.5468  
Epoch 28/50  
83/83 \_\_\_\_\_ 49s 550ms/step - accuracy: 0.7118 - loss: 0.5596 - val\_accuracy: 0.6924 - val\_loss: 0.6436  
Epoch 29/50  
83/83 \_\_\_\_\_ 49s 550ms/step - accuracy: 0.7292 - loss: 0.5431 - val\_accuracy: 0.7682 - val\_loss: 0.5199  
Epoch 30/50  
83/83 \_\_\_\_\_ 48s 540ms/step - accuracy: 0.7319 - loss: 0.5223 - val\_accuracy: 0.7606 - val\_loss: 0.5062  
Epoch 31/50  
83/83 \_\_\_\_\_ 48s 546ms/step - accuracy: 0.7132 - loss: 0.5483 - val\_accuracy: 0.6848 - val\_loss: 0.5776  
Epoch 32/50  
83/83 \_\_\_\_\_ 85s 559ms/step - accuracy: 0.7020 - loss: 0.5428 - val\_accuracy: 0.7621 - val\_loss: 0.5223  
Epoch 33/50  
83/83 \_\_\_\_\_ 49s 532ms/step - accuracy: 0.7471 - loss: 0.5112 - val\_accuracy: 0.7636 - val\_loss: 0.5092  
Epoch 34/50  
83/83 \_\_\_\_\_ 49s 531ms/step - accuracy: 0.7198 - loss: 0.5125 - val\_accuracy: 0.7652 - val\_loss: 0.5016  
Epoch 35/50  
83/83 \_\_\_\_\_ 81s 536ms/step - accuracy: 0.7382 - loss: 0.5292 - val\_accuracy: 0.7636 - val\_loss: 0.5131  
Epoch 36/50  
83/83 \_\_\_\_\_ 83s 538ms/step - accuracy: 0.7309 - loss: 0.5341 - val\_accuracy: 0.7758 - val\_loss: 0.5029  
Epoch 37/50  
83/83 \_\_\_\_\_ 49s 550ms/step - accuracy: 0.7341 - loss: 0.5250 - val\_accuracy: 0.7348 - val\_loss: 0.4939  
Epoch 38/50  
83/83 \_\_\_\_\_ 82s 552ms/step - accuracy: 0.7383 - loss: 0.5144 - val\_accuracy: 0.7318 - val\_loss: 0.4924  
Epoch 39/50  
83/83 \_\_\_\_\_ 48s 535ms/step - accuracy: 0.7439 - loss: 0.4981 - val\_accuracy: 0.7712 - val\_loss: 0.4952

```

Epoch 40/50
83/83 _____ 83s 550ms/step - accuracy: 0.7559 - loss:
0.5037 - val_accuracy: 0.7621 - val_loss: 0.5203
Epoch 41/50
83/83 _____ 49s 553ms/step - accuracy: 0.7521 - loss:
0.5101 - val_accuracy: 0.7727 - val_loss: 0.4891
Epoch 42/50
83/83 _____ 83s 550ms/step - accuracy: 0.7380 - loss:
0.5186 - val_accuracy: 0.7303 - val_loss: 0.5904
Epoch 43/50
83/83 _____ 47s 529ms/step - accuracy: 0.7607 - loss:
0.4996 - val_accuracy: 0.7106 - val_loss: 0.5242
Epoch 44/50
83/83 _____ 83s 546ms/step - accuracy: 0.7371 - loss:
0.5305 - val_accuracy: 0.7636 - val_loss: 0.5295
Epoch 45/50
83/83 _____ 81s 538ms/step - accuracy: 0.7431 - loss:
0.5172 - val_accuracy: 0.7318 - val_loss: 0.4839
Epoch 46/50
83/83 _____ 84s 536ms/step - accuracy: 0.7433 - loss:
0.4898 - val_accuracy: 0.7742 - val_loss: 0.4813
Epoch 47/50
83/83 _____ 49s 535ms/step - accuracy: 0.7577 - loss:
0.4939 - val_accuracy: 0.7682 - val_loss: 0.5016
Epoch 48/50
83/83 _____ 82s 551ms/step - accuracy: 0.7570 - loss:
0.5001 - val_accuracy: 0.7197 - val_loss: 0.5018
Epoch 49/50
83/83 _____ 82s 535ms/step - accuracy: 0.7450 - loss:
0.4958 - val_accuracy: 0.7652 - val_loss: 0.5038
Epoch 50/50
83/83 _____ 81s 542ms/step - accuracy: 0.7631 - loss:
0.4831 - val_accuracy: 0.7212 - val_loss: 0.4876

```

*# Step 3.10: Evaluate Resnet Models*

```

print("Evaluating ResNet Model...")
loss, accuracy = model_resnet.evaluate(test_generator)
print(f"ResNet Test Accuracy: {accuracy}")

```

Evaluating ResNet Model...

```

21/21 _____ 3s 157ms/step - accuracy: 0.7060 - loss:
0.5775
ResNet Test Accuracy: 0.7151514887809753

```

*# Step 3.11 : Evaluate Both Models*

```

print("Evaluating YOLOv8 Model...")
metrics_yolo = model_yolo.val(data='/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet',split='test')
print("YOLOv8 Metrics:", metrics_yolo)

```



```

print("Evaluating ResNet Model...")
loss, accuracy = model_resnet.evaluate(test_generator)
print(f"ResNet Test Accuracy: {accuracy}")

Evaluating YOLOv8 Model...
Ultralytics 8.3.59 Python-3.10.12 torch-2.5.1+cu121 CUDA:0 (Tesla
T4, 15102MiB)
train: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/train... found 2637 images
in 2 classes
val: None...
test: /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test... found 660 images in
2 classes

test: Scanning /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test... 660 images, 0
corrupt: 100%|██████████| 660/660 [00:00<?, ?it/s]
          classes top1_acc top5_acc: 100%|██████████| 21/21
[00:05<00:00, 4.00it/s]

          all      0.895      1
Speed: 0.1ms preprocess, 0.5ms inference, 0.0ms loss, 0.0ms
postprocess per image
Results saved to runs/classify/train56
YOLOv8 Metrics: ultralytics.utils.metrics.ClassifyMetrics object with
attributes:

confusion_matrix: <ultralytics.utils.metrics.ConfusionMatrix object at
0x7f083a3c3be0>
curves: []
curves_results: []
fitness: 0.9477272629737854
keys: ['metrics/accuracy_top1', 'metrics/accuracy_top5']
results_dict: {'metrics/accuracy_top1': 0.8954545259475708,
'metrics/accuracy_top5': 1.0, 'fitness': 0.9477272629737854}
save_dir: PosixPath('runs/classify/train56')
speed: {'preprocess': 0.09690884387854373, 'inference':
0.5448706222302986, 'loss': 0.002307964093757398, 'postprocess':
0.0008481921571673769}
task: 'classify'
top1: 0.8954545259475708
top5: 1.0
Evaluating ResNet Model...
21/21 _____ 3s 154ms/step - accuracy: 0.6987 - loss:
0.5802
ResNet Test Accuracy: 0.7151514887809753

```

# 4. Ensemble Learning.

```

print("Performing YOLOv8 Predictions...")

yolo_results = []

test_dir = '/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test'
subdirs = [os.path.join(test_dir, subdir) for subdir in
os.listdir(test_dir) if os.path.isdir(os.path.join(test_dir, subdir))]

# Predict using YOLOv8 on each class folder
for subdir in subdirs:
    results = model_yolo.predict(source=subdir, save=True)
    yolo_results.extend(results)

# Extract YOLOv8 probabilities
yolo_probs = []
for result in yolo_results:
    yolo_probs.append(result.probs)

# Step 2: ResNet Predictions
print("Performing ResNet Predictions...")

test_datagen = ImageDataGenerator(rescale=1./255)
test_generator = test_datagen.flow_from_directory(
    directory='/content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test',
    target_size=(224, 224),
    batch_size=32,
    class_mode='binary',
    shuffle=False
)

resnet_predictions = []
for i, (images, labels) in enumerate(test_generator):
    preds = model_resnet.predict(images)
    resnet_predictions.extend(preds)
    if i >= len(test_generator) - 1: # Ensure all batches are
processed
        break

resnet_predictions = np.array(resnet_predictions)
resnet_classes = (resnet_predictions > 0.5).astype(int) # Threshold
at 0.5

Performing YOLOv8 Predictions...

image 1/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/1.jpg: 224x224
benign 0.96, malignant 0.04, 5.6ms
image 2/360 /content/drive/MyDrive/Deep

```

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/10.jpg: 224x224  
benign 0.91, malignant 0.09, 3.2ms  
image 3/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1003.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 4/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1006.jpg:  
224x224 benign 0.94, malignant 0.06, 8.1ms  
image 5/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1013.jpg:  
224x224 benign 1.00, malignant 0.00, 4.4ms  
image 6/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1018.jpg:  
224x224 benign 0.66, malignant 0.34, 3.1ms  
image 7/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1019.jpg:  
224x224 benign 1.00, malignant 0.00, 3.4ms  
image 8/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1023.jpg:  
224x224 benign 1.00, malignant 0.00, 3.7ms  
image 9/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1025.jpg:  
224x224 benign 0.81, malignant 0.19, 2.9ms  
image 10/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1029.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 11/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1033.jpg:  
224x224 benign 0.83, malignant 0.17, 4.0ms  
image 12/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1034.jpg:  
224x224 benign 0.61, malignant 0.39, 2.8ms  
image 13/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1042.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 14/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1044.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 15/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/105.jpg:  
224x224 malignant 0.74, benign 0.26, 2.9ms  
image 16/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1055.jpg:  
224x224 benign 0.61, malignant 0.39, 2.9ms  
image 17/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1061.jpg:  
224x224 benign 0.51, malignant 0.49, 2.9ms  
image 18/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1070.jpg:

224x224 malignant 0.69, benign 0.31, 2.8ms  
image 19/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1074.jpg:  
224x224 benign 0.80, malignant 0.20, 2.9ms  
image 20/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1077.jpg:  
224x224 benign 1.00, malignant 0.00, 4.4ms  
image 21/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1080.jpg:  
224x224 benign 1.00, malignant 0.00, 4.0ms  
image 22/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1087.jpg:  
224x224 benign 0.80, malignant 0.20, 2.7ms  
image 23/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1088.jpg:  
224x224 benign 0.67, malignant 0.33, 2.9ms  
image 24/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1092.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 25/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/11.jpg: 224x224  
benign 0.97, malignant 0.03, 3.0ms  
image 26/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1110.jpg:  
224x224 benign 0.99, malignant 0.01, 3.0ms  
image 27/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1112.jpg:  
224x224 malignant 0.65, benign 0.35, 3.0ms  
image 28/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1115.jpg:  
224x224 benign 0.66, malignant 0.34, 3.1ms  
image 29/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1118.jpg:  
224x224 benign 0.99, malignant 0.01, 2.9ms  
image 30/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1125.jpg:  
224x224 benign 0.74, malignant 0.26, 3.1ms  
image 31/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1126.jpg:  
224x224 benign 0.77, malignant 0.23, 2.9ms  
image 32/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1130.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 33/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1134.jpg:  
224x224 malignant 0.55, benign 0.45, 3.6ms  
image 34/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1135.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms

image 35/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1139.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 36/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1143.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 37/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1146.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 38/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1151.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 39/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1155.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 40/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1166.jpg:  
224x224 benign 0.98, malignant 0.02, 4.1ms  
image 41/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1170.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 42/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1173.jpg:  
224x224 benign 0.67, malignant 0.33, 4.7ms  
image 43/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1177.jpg:  
224x224 benign 1.00, malignant 0.00, 4.3ms  
image 44/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1180.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 45/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1183.jpg:  
224x224 benign 0.85, malignant 0.15, 4.2ms  
image 46/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/119.jpg:  
224x224 benign 0.98, malignant 0.02, 3.8ms  
image 47/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1191.jpg:  
224x224 malignant 0.78, benign 0.22, 3.8ms  
image 48/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1200.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 49/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1203.jpg:  
224x224 benign 1.00, malignant 0.00, 4.4ms  
image 50/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1208.jpg:  
224x224 malignant 0.61, benign 0.39, 4.1ms  
image 51/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1214.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 52/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1215.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 53/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/122.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 54/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1226.jpg:  
224x224 benign 1.00, malignant 0.00, 6.7ms  
image 55/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1231.jpg:  
224x224 benign 0.98, malignant 0.02, 5.1ms  
image 56/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1242.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 57/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1243.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 58/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1244.jpg:  
224x224 malignant 0.63, benign 0.37, 3.0ms  
image 59/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1253.jpg:  
224x224 benign 0.90, malignant 0.10, 3.3ms  
image 60/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1261.jpg:  
224x224 benign 0.99, malignant 0.01, 4.7ms  
image 61/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1265.jpg:  
224x224 benign 0.69, malignant 0.31, 2.9ms  
image 62/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1266.jpg:  
224x224 malignant 0.93, benign 0.07, 3.1ms  
image 63/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1269.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 64/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/127.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 65/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1273.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 66/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1276.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 67/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1277.jpg:

224x224 benign 1.00, malignant 0.00, 3.0ms  
image 68/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1278.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 69/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1288.jpg:  
224x224 benign 0.70, malignant 0.30, 3.2ms  
image 70/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1290.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 71/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1297.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 72/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1299.jpg:  
224x224 benign 0.99, malignant 0.01, 2.7ms  
image 73/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1310.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 74/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1319.jpg:  
224x224 benign 0.91, malignant 0.09, 2.9ms  
image 75/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1321.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 76/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1322.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 77/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1334.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 78/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1342.jpg:  
224x224 malignant 0.77, benign 0.23, 2.7ms  
image 79/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1343.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 80/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1350.jpg:  
224x224 benign 0.98, malignant 0.02, 3.2ms  
image 81/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1354.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 82/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1357.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 83/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1359.jpg:  
224x224 malignant 0.86, benign 0.14, 3.1ms

image 84/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1362.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 85/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1365.jpg:  
224x224 benign 0.98, malignant 0.02, 2.8ms  
image 86/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1367.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 87/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1373.jpg:  
224x224 benign 0.73, malignant 0.27, 3.0ms  
image 88/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1376.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 89/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1377.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 90/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1378.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 91/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1381.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 92/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1393.jpg:  
224x224 benign 0.65, malignant 0.35, 3.1ms  
image 93/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/140.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 94/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1400.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 95/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1401.jpg:  
224x224 malignant 0.76, benign 0.24, 3.1ms  
image 96/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1409.jpg:  
224x224 benign 0.83, malignant 0.17, 3.2ms  
image 97/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1412.jpg:  
224x224 malignant 0.58, benign 0.42, 3.1ms  
image 98/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1415.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 99/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/144.jpg:  
224x224 benign 0.99, malignant 0.01, 4.0ms  
image 100/360 /content/drive/MyDrive/Deep



Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1441.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 101/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1443.jpg:  
224x224 benign 0.99, malignant 0.01, 3.0ms  
image 102/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1445.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 103/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1448.jpg:  
224x224 benign 1.00, malignant 0.00, 3.3ms  
image 104/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1466.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 105/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1468.jpg:  
224x224 benign 0.99, malignant 0.01, 4.1ms  
image 106/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/147.jpg:  
224x224 benign 0.95, malignant 0.05, 3.8ms  
image 107/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1471.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 108/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1473.jpg:  
224x224 benign 1.00, malignant 0.00, 6.9ms  
image 109/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1479.jpg:  
224x224 benign 0.98, malignant 0.02, 3.8ms  
image 110/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1481.jpg:  
224x224 malignant 0.90, benign 0.10, 3.4ms  
image 111/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1483.jpg:  
224x224 benign 0.55, malignant 0.45, 4.5ms  
image 112/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1485.jpg:  
224x224 benign 0.68, malignant 0.32, 4.2ms  
image 113/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1488.jpg:  
224x224 malignant 0.53, benign 0.47, 4.8ms  
image 114/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1492.jpg:  
224x224 benign 0.56, malignant 0.44, 3.8ms  
image 115/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1499.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 116/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/15.jpg: 224x224

benign 1.00, malignant 0.00, 4.4ms  
image 117/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1502.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 118/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1514.jpg:  
224x224 benign 0.63, malignant 0.37, 4.2ms  
image 119/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1516.jpg:  
224x224 benign 1.00, malignant 0.00, 9.2ms  
image 120/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1519.jpg:  
224x224 benign 1.00, malignant 0.00, 4.3ms  
image 121/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1521.jpg:  
224x224 malignant 0.79, benign 0.21, 6.6ms  
image 122/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1530.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 123/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1537.jpg:  
224x224 benign 0.64, malignant 0.36, 3.1ms  
image 124/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1538.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 125/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/154.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 126/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1545.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 127/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1559.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 128/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1576.jpg:  
224x224 benign 0.79, malignant 0.21, 3.6ms  
image 129/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1578.jpg:  
224x224 benign 0.59, malignant 0.41, 3.8ms  
image 130/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1579.jpg:  
224x224 benign 1.00, malignant 0.00, 3.7ms  
image 131/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1592.jpg:  
224x224 benign 0.68, malignant 0.32, 3.0ms  
image 132/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/16.jpg: 224x224  
benign 1.00, malignant 0.00, 3.6ms

image 133/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1602.jpg:  
224x224 malignant 0.91, benign 0.09, 3.1ms  
image 134/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1607.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 135/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/161.jpg:  
224x224 malignant 0.70, benign 0.30, 3.1ms  
image 136/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1610.jpg:  
224x224 benign 1.00, malignant 0.00, 3.3ms  
image 137/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1611.jpg:  
224x224 benign 1.00, malignant 0.00, 3.7ms  
image 138/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1628.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 139/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1632.jpg:  
224x224 benign 1.00, malignant 0.00, 6.1ms  
image 140/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1634.jpg:  
224x224 malignant 0.83, benign 0.17, 2.9ms  
image 141/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1637.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 142/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1642.jpg:  
224x224 benign 0.91, malignant 0.09, 2.9ms  
image 143/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1646.jpg:  
224x224 benign 0.77, malignant 0.23, 2.9ms  
image 144/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1648.jpg:  
224x224 benign 0.83, malignant 0.17, 2.8ms  
image 145/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1655.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 146/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1657.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 147/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1672.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 148/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1682.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 149/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1687.jpg:  
224x224 benign 0.50, malignant 0.50, 5.4ms  
image 150/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1696.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 151/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1701.jpg:  
224x224 malignant 0.61, benign 0.39, 3.7ms  
image 152/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1704.jpg:  
224x224 benign 0.85, malignant 0.15, 3.2ms  
image 153/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1710.jpg:  
224x224 malignant 0.62, benign 0.38, 4.8ms  
image 154/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1711.jpg:  
224x224 malignant 0.65, benign 0.35, 3.3ms  
image 155/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1714.jpg:  
224x224 benign 0.99, malignant 0.01, 3.0ms  
image 156/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1719.jpg:  
224x224 benign 1.00, malignant 0.00, 6.8ms  
image 157/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1721.jpg:  
224x224 benign 0.82, malignant 0.18, 3.2ms  
image 158/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1731.jpg:  
224x224 benign 0.84, malignant 0.16, 4.2ms  
image 159/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1737.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 160/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1745.jpg:  
224x224 benign 0.56, malignant 0.44, 3.1ms  
image 161/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1747.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 162/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1748.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 163/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1756.jpg:  
224x224 benign 0.99, malignant 0.01, 4.7ms  
image 164/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1757.jpg:  
224x224 malignant 0.60, benign 0.40, 3.9ms  
image 165/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1758.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms

image 166/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1764.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 167/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1768.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 168/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1773.jpg:  
224x224 benign 1.00, malignant 0.00, 4.3ms  
image 169/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1797.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 170/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1798.jpg:  
224x224 benign 0.90, malignant 0.10, 5.2ms  
image 171/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/18.jpg: 224x224  
benign 1.00, malignant 0.00, 4.0ms  
image 172/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/1800.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 173/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/185.jpg:  
224x224 benign 1.00, malignant 0.00, 4.7ms  
image 174/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/186.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 175/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/2.jpg: 224x224  
benign 0.55, malignant 0.45, 4.2ms  
image 176/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/205.jpg:  
224x224 benign 1.00, malignant 0.00, 4.0ms  
image 177/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/211.jpg:  
224x224 benign 0.99, malignant 0.01, 6.9ms  
image 178/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/215.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 179/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/216.jpg:  
224x224 benign 1.00, malignant 0.00, 5.1ms  
image 180/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/224.jpg:  
224x224 benign 0.73, malignant 0.27, 3.2ms  
image 181/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/226.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 182/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/237.jpg:  
224x224 benign 0.81, malignant 0.19, 3.0ms  
image 183/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/245.jpg:  
224x224 benign 0.61, malignant 0.39, 3.3ms  
image 184/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/250.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 185/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/251.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 186/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/253.jpg:  
224x224 benign 0.55, malignant 0.45, 3.7ms  
image 187/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/256.jpg:  
224x224 benign 0.95, malignant 0.05, 3.3ms  
image 188/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/259.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 189/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/267.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 190/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/268.jpg:  
224x224 benign 0.56, malignant 0.44, 3.0ms  
image 191/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/273.jpg:  
224x224 benign 0.53, malignant 0.47, 2.9ms  
image 192/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/284.jpg:  
224x224 benign 1.00, malignant 0.00, 3.3ms  
image 193/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/287.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 194/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/289.jpg:  
224x224 benign 1.00, malignant 0.00, 3.3ms  
image 195/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/291.jpg:  
224x224 benign 0.98, malignant 0.02, 2.9ms  
image 196/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/300.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 197/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/303.jpg:  
224x224 benign 0.99, malignant 0.01, 4.1ms  
image 198/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/304.jpg:

224x224 benign 0.81, malignant 0.19, 3.8ms  
image 199/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/31.jpg: 224x224  
benign 0.77, malignant 0.23, 2.9ms  
image 200/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/311.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 201/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/313.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 202/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/317.jpg:  
224x224 benign 0.99, malignant 0.01, 2.9ms  
image 203/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/322.jpg:  
224x224 malignant 0.83, benign 0.17, 3.1ms  
image 204/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/323.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 205/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/330.jpg:  
224x224 benign 0.97, malignant 0.03, 2.8ms  
image 206/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/332.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 207/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/335.jpg:  
224x224 benign 0.83, malignant 0.17, 3.1ms  
image 208/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/344.jpg:  
224x224 benign 0.67, malignant 0.33, 2.8ms  
image 209/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/348.jpg:  
224x224 malignant 0.52, benign 0.48, 2.9ms  
image 210/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/354.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 211/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/356.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 212/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/367.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 213/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/369.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 214/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/37.jpg: 224x224  
benign 0.51, malignant 0.49, 3.2ms

image 215/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/378.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 216/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/379.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 217/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/385.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 218/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/388.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 219/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/389.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 220/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/394.jpg:  
224x224 benign 0.78, malignant 0.22, 2.9ms  
image 221/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/404.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 222/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/407.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 223/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/414.jpg:  
224x224 benign 0.92, malignant 0.08, 3.7ms  
image 224/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/419.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 225/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/427.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 226/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/428.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 227/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/433.jpg:  
224x224 malignant 0.92, benign 0.08, 4.2ms  
image 228/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/436.jpg:  
224x224 benign 0.66, malignant 0.34, 3.8ms  
image 229/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/437.jpg:  
224x224 benign 0.99, malignant 0.01, 3.7ms  
image 230/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/44.jpg: 224x224  
benign 1.00, malignant 0.00, 3.8ms  
image 231/360 /content/drive/MyDrive/Deep



Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/444.jpg:  
224x224 benign 0.98, malignant 0.02, 5.1ms  
image 232/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/449.jpg:  
224x224 benign 0.73, malignant 0.27, 3.9ms  
image 233/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/45.jpg: 224x224  
benign 0.99, malignant 0.01, 4.0ms  
image 234/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/454.jpg:  
224x224 benign 1.00, malignant 0.00, 4.3ms  
image 235/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/457.jpg:  
224x224 benign 1.00, malignant 0.00, 5.5ms  
image 236/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/462.jpg:  
224x224 benign 1.00, malignant 0.00, 4.4ms  
image 237/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/475.jpg:  
224x224 benign 0.99, malignant 0.01, 3.9ms  
image 238/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/479.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 239/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/484.jpg:  
224x224 benign 0.73, malignant 0.27, 2.8ms  
image 240/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/495.jpg:  
224x224 benign 1.00, malignant 0.00, 2.9ms  
image 241/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/5.jpg: 224x224  
benign 0.81, malignant 0.19, 4.7ms  
image 242/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/520.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 243/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/527.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 244/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/532.jpg:  
224x224 benign 0.84, malignant 0.16, 3.1ms  
image 245/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/535.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 246/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/536.jpg:  
224x224 benign 1.00, malignant 0.00, 3.4ms  
image 247/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/54.jpg: 224x224

benign 1.00, malignant 0.00, 2.9ms  
image 248/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/545.jpg:  
224x224 benign 1.00, malignant 0.00, 3.3ms  
image 249/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/548.jpg:  
224x224 benign 0.67, malignant 0.33, 2.9ms  
image 250/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/552.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 251/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/558.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 252/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/559.jpg:  
224x224 malignant 0.82, benign 0.18, 3.2ms  
image 253/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/560.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 254/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/561.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 255/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/562.jpg:  
224x224 benign 0.99, malignant 0.01, 4.7ms  
image 256/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/566.jpg:  
224x224 benign 0.56, malignant 0.44, 3.3ms  
image 257/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/57.jpg: 224x224  
benign 1.00, malignant 0.00, 4.8ms  
image 258/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/572.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 259/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/573.jpg:  
224x224 benign 0.81, malignant 0.19, 3.0ms  
image 260/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/574.jpg:  
224x224 benign 1.00, malignant 0.00, 4.0ms  
image 261/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/575.jpg:  
224x224 benign 0.90, malignant 0.10, 3.6ms  
image 262/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/580.jpg:  
224x224 benign 0.69, malignant 0.31, 3.5ms  
image 263/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/588.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms

image 264/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/596.jpg:  
224x224 benign 1.00, malignant 0.00, 2.7ms  
image 265/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/603.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 266/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/61.jpg: 224x224  
benign 1.00, malignant 0.00, 2.9ms  
image 267/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/612.jpg:  
224x224 benign 0.99, malignant 0.01, 3.2ms  
image 268/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/623.jpg:  
224x224 benign 0.56, malignant 0.44, 2.9ms  
image 269/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/624.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 270/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/626.jpg:  
224x224 benign 0.95, malignant 0.05, 2.9ms  
image 271/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/63.jpg: 224x224  
benign 0.98, malignant 0.02, 3.0ms  
image 272/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/631.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 273/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/634.jpg:  
224x224 benign 0.55, malignant 0.45, 3.0ms  
image 274/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/635.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 275/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/636.jpg:  
224x224 malignant 0.59, benign 0.41, 3.2ms  
image 276/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/642.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 277/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/644.jpg:  
224x224 malignant 0.57, benign 0.43, 2.8ms  
image 278/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/647.jpg:  
224x224 benign 0.89, malignant 0.11, 3.1ms  
image 279/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/658.jpg:  
224x224 benign 0.99, malignant 0.01, 3.0ms  
image 280/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/659.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 281/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/660.jpg:  
224x224 malignant 0.72, benign 0.28, 2.9ms  
image 282/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/663.jpg:  
224x224 benign 0.98, malignant 0.02, 2.9ms  
image 283/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/664.jpg:  
224x224 benign 1.00, malignant 0.00, 2.8ms  
image 284/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/668.jpg:  
224x224 benign 0.65, malignant 0.35, 3.0ms  
image 285/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/670.jpg:  
224x224 malignant 0.99, benign 0.01, 3.9ms  
image 286/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/676.jpg:  
224x224 malignant 0.53, benign 0.47, 5.0ms  
image 287/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/678.jpg:  
224x224 benign 0.93, malignant 0.07, 4.1ms  
image 288/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/681.jpg:  
224x224 benign 0.98, malignant 0.02, 3.9ms  
image 289/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/689.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 290/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/690.jpg:  
224x224 benign 1.00, malignant 0.00, 3.9ms  
image 291/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/700.jpg:  
224x224 benign 1.00, malignant 0.00, 4.1ms  
image 292/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/71.jpg: 224x224  
malignant 0.83, benign 0.17, 4.0ms  
image 293/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/712.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 294/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/717.jpg:  
224x224 benign 0.65, malignant 0.35, 5.7ms  
image 295/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/720.jpg:  
224x224 benign 1.00, malignant 0.00, 6.3ms  
image 296/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/721.jpg:

224x224 benign 1.00, malignant 0.00, 4.0ms  
image 297/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/724.jpg:  
224x224 benign 0.91, malignant 0.09, 4.3ms  
image 298/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/725.jpg:  
224x224 benign 1.00, malignant 0.00, 4.4ms  
image 299/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/74.jpg: 224x224  
benign 1.00, malignant 0.00, 3.1ms  
image 300/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/751.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 301/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/758.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 302/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/762.jpg:  
224x224 benign 1.00, malignant 0.00, 3.0ms  
image 303/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/763.jpg:  
224x224 benign 1.00, malignant 0.00, 4.2ms  
image 304/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/768.jpg:  
224x224 benign 1.00, malignant 0.00, 4.9ms  
image 305/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/770.jpg:  
224x224 benign 0.90, malignant 0.10, 3.3ms  
image 306/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/773.jpg:  
224x224 benign 0.84, malignant 0.16, 2.9ms  
image 307/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/774.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 308/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/778.jpg:  
224x224 benign 0.84, malignant 0.16, 3.1ms  
image 309/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/790.jpg:  
224x224 benign 1.00, malignant 0.00, 3.1ms  
image 310/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/8.jpg: 224x224  
benign 1.00, malignant 0.00, 3.5ms  
image 311/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/802.jpg:  
224x224 benign 0.85, malignant 0.15, 4.1ms  
image 312/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/805.jpg:  
224x224 benign 1.00, malignant 0.00, 4.0ms

image 313/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/806.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 314/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/813.jpg:  
224x224 benign 0.99, malignant 0.01, 4.3ms  
image 315/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/819.jpg:  
224x224 benign 0.78, malignant 0.22, 3.2ms  
image 316/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/820.jpg:  
224x224 benign 1.00, malignant 0.00, 3.2ms  
image 317/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/823.jpg:  
224x224 benign 0.90, malignant 0.10, 3.0ms  
image 318/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/824.jpg:  
224x224 benign 0.67, malignant 0.33, 3.3ms  
image 319/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/825.jpg:  
224x224 benign 1.00, malignant 0.00, 6.6ms  
image 320/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/826.jpg:  
224x224 benign 1.00, malignant 0.00, 5.2ms  
image 321/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/828.jpg:  
224x224 benign 1.00, malignant 0.00, 5.3ms  
image 322/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/83.jpg: 224x224  
benign 1.00, malignant 0.00, 5.0ms  
image 323/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/830.jpg:  
224x224 benign 1.00, malignant 0.00, 6.0ms  
image 324/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/84.jpg: 224x224  
benign 1.00, malignant 0.00, 4.8ms  
image 325/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/840.jpg:  
224x224 benign 1.00, malignant 0.00, 5.3ms  
image 326/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/854.jpg:  
224x224 benign 1.00, malignant 0.00, 5.7ms  
image 327/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/869.jpg:  
224x224 benign 0.98, malignant 0.02, 3.9ms  
image 328/360 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/874.jpg:  
224x224 benign 1.00, malignant 0.00, 3.5ms  
image 329/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/878.jpg:  
224x224 benign 0.88, malignant 0.12, 4.0ms  
image 330/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/88.jpg: 224x224  
benign 1.00, malignant 0.00, 4.0ms  
image 331/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/880.jpg:  
224x224 benign 0.93, malignant 0.07, 5.4ms  
image 332/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/887.jpg:  
224x224 benign 1.00, malignant 0.00, 5.3ms  
image 333/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/888.jpg:  
224x224 benign 0.99, malignant 0.01, 5.9ms  
image 334/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/892.jpg:  
224x224 malignant 0.66, benign 0.34, 7.8ms  
image 335/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/893.jpg:  
224x224 benign 1.00, malignant 0.00, 4.3ms  
image 336/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/894.jpg:  
224x224 benign 0.92, malignant 0.08, 3.9ms  
image 337/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/895.jpg:  
224x224 benign 1.00, malignant 0.00, 6.0ms  
image 338/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/9.jpg: 224x224  
benign 1.00, malignant 0.00, 6.4ms  
image 339/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/90.jpg: 224x224  
benign 1.00, malignant 0.00, 3.7ms  
image 340/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/903.jpg:  
224x224 benign 0.90, malignant 0.10, 3.9ms  
image 341/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/906.jpg:  
224x224 benign 0.54, malignant 0.46, 4.9ms  
image 342/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/909.jpg:  
224x224 benign 0.68, malignant 0.32, 4.6ms  
image 343/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/912.jpg:  
224x224 benign 0.96, malignant 0.04, 5.4ms  
image 344/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/916.jpg:  
224x224 benign 0.78, malignant 0.22, 7.6ms  
image 345/360 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/benign/919.jpg:  
224x224 benign 0.95, malignant 0.05, 8.2ms

```
image 346/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/925.jpg:
224x224 benign 0.60, malignant 0.40, 4.6ms
image 347/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/936.jpg:
224x224 benign 1.00, malignant 0.00, 7.6ms
image 348/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/943.jpg:
224x224 benign 1.00, malignant 0.00, 8.5ms
image 349/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/944.jpg:
224x224 benign 1.00, malignant 0.00, 7.8ms
image 350/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/946.jpg:
224x224 benign 1.00, malignant 0.00, 6.7ms
image 351/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/95.jpg: 224x224
benign 0.99, malignant 0.01, 4.1ms
image 352/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/958.jpg:
224x224 benign 0.87, malignant 0.13, 4.0ms
image 353/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/962.jpg:
224x224 benign 1.00, malignant 0.00, 5.4ms
image 354/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/964.jpg:
224x224 benign 0.80, malignant 0.20, 5.2ms
image 355/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/97.jpg: 224x224
benign 1.00, malignant 0.00, 4.4ms
image 356/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/972.jpg:
224x224 benign 1.00, malignant 0.00, 3.7ms
image 357/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/98.jpg: 224x224
benign 1.00, malignant 0.00, 3.9ms
image 358/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/982.jpg:
224x224 benign 0.93, malignant 0.07, 5.6ms
image 359/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/993.jpg:
224x224 benign 1.00, malignant 0.00, 4.5ms
image 360/360 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/benign/998.jpg:
224x224 benign 1.00, malignant 0.00, 3.6ms
Speed: 2.3ms preprocess, 3.7ms inference, 0.1ms postprocess per image
at shape (1, 3, 224, 224)
Results saved to runs/classify/train512
```



image 1/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1.jpg:  
224x224 malignant 0.96, benign 0.04, 5.5ms  
image 2/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1003.jpg:  
224x224 malignant 0.96, benign 0.04, 5.5ms  
image 3/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1005.jpg:  
224x224 malignant 1.00, benign 0.00, 4.1ms  
image 4/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1007.jpg:  
224x224 malignant 0.64, benign 0.36, 17.7ms  
image 5/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1009.jpg:  
224x224 benign 0.54, malignant 0.46, 9.7ms  
image 6/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1012.jpg:  
224x224 benign 0.75, malignant 0.25, 6.2ms  
image 7/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1019.jpg:  
224x224 benign 0.79, malignant 0.21, 8.6ms  
image 8/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1022.jpg:  
224x224 malignant 0.83, benign 0.17, 4.0ms  
image 9/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1026.jpg:  
224x224 malignant 0.91, benign 0.09, 3.9ms  
image 10/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1027.jpg:  
224x224 malignant 0.96, benign 0.04, 4.1ms  
image 11/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1037.jpg:  
224x224 malignant 0.69, benign 0.31, 4.0ms  
image 12/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1038.jpg:  
224x224 malignant 0.96, benign 0.04, 7.8ms  
image 13/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1046.jpg:  
224x224 malignant 0.98, benign 0.02, 3.7ms  
image 14/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1049.jpg:  
224x224 malignant 0.65, benign 0.35, 3.6ms  
image 15/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1056.jpg:  
224x224 malignant 0.54, benign 0.46, 3.8ms  
image 16/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1058.jpg:  
224x224 benign 0.60, malignant 0.40, 3.6ms  
image 17/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1065.jpg:  
224x224 malignant 0.89, benign 0.11, 3.6ms  
image 18/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1074.jpg:  
224x224 benign 0.64, malignant 0.36, 7.2ms  
image 19/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1080.jpg:  
224x224 malignant 0.78, benign 0.22, 4.0ms  
image 20/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1083.jpg:  
224x224 benign 0.97, malignant 0.03, 5.9ms  
image 21/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1089.jpg:  
224x224 malignant 0.86, benign 0.14, 3.7ms  
image 22/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1091.jpg:  
224x224 malignant 0.75, benign 0.25, 3.5ms  
image 23/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1094.jpg:  
224x224 benign 0.72, malignant 0.28, 3.5ms  
image 24/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/110.jpg:  
224x224 benign 0.81, malignant 0.19, 3.5ms  
image 25/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1112.jpg:  
224x224 malignant 0.64, benign 0.36, 6.0ms  
image 26/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1113.jpg:  
224x224 malignant 0.64, benign 0.36, 3.9ms  
image 27/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1119.jpg:  
224x224 malignant 0.99, benign 0.01, 3.7ms  
image 28/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1120.jpg:  
224x224 malignant 0.98, benign 0.02, 3.5ms  
image 29/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1128.jpg:  
224x224 benign 0.92, malignant 0.08, 3.9ms  
image 30/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1135.jpg:  
224x224 malignant 0.52, benign 0.48, 3.7ms  
image 31/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1141.jpg:  
224x224 malignant 0.92, benign 0.08, 3.5ms  
image 32/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1150.jpg:  
224x224 malignant 0.94, benign 0.06, 4.1ms  
image 33/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1151.jpg:

224x224 malignant 0.98, benign 0.02, 6.1ms  
image 34/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1155.jpg:  
224x224 malignant 0.94, benign 0.06, 4.8ms  
image 35/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1156.jpg:  
224x224 malignant 0.73, benign 0.27, 4.7ms  
image 36/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1160.jpg:  
224x224 malignant 0.52, benign 0.48, 4.4ms  
image 37/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1164.jpg:  
224x224 malignant 0.99, benign 0.01, 4.8ms  
image 38/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1166.jpg:  
224x224 malignant 0.62, benign 0.38, 4.5ms  
image 39/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1170.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 40/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1173.jpg:  
224x224 malignant 0.99, benign 0.01, 6.5ms  
image 41/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1176.jpg:  
224x224 malignant 0.88, benign 0.12, 4.9ms  
image 42/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1185.jpg:  
224x224 malignant 0.97, benign 0.03, 4.8ms  
image 43/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1186.jpg:  
224x224 malignant 0.83, benign 0.17, 5.9ms  
image 44/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1187.jpg:  
224x224 malignant 0.94, benign 0.06, 5.8ms  
image 45/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1189.jpg:  
224x224 malignant 0.90, benign 0.10, 6.2ms  
image 46/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1194.jpg:  
224x224 malignant 0.98, benign 0.02, 3.9ms  
image 47/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1197.jpg:  
224x224 malignant 0.61, benign 0.39, 6.5ms  
image 48/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1198.jpg:  
224x224 malignant 0.58, benign 0.42, 5.2ms  
image 49/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1211.jpg:  
224x224 benign 0.73, malignant 0.27, 3.8ms

image 50/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1215.jpg:  
224x224 benign 1.00, malignant 0.00, 3.8ms  
image 51/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1216.jpg:  
224x224 malignant 0.99, benign 0.01, 4.2ms  
image 52/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1218.jpg:  
224x224 malignant 0.96, benign 0.04, 3.9ms  
image 53/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1220.jpg:  
224x224 benign 0.71, malignant 0.29, 5.4ms  
image 54/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1221.jpg:  
224x224 benign 0.64, malignant 0.36, 6.3ms  
image 55/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1227.jpg:  
224x224 malignant 0.99, benign 0.01, 6.3ms  
image 56/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1228.jpg:  
224x224 malignant 0.96, benign 0.04, 5.4ms  
image 57/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1229.jpg:  
224x224 benign 0.71, malignant 0.29, 6.1ms  
image 58/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1234.jpg:  
224x224 malignant 0.94, benign 0.06, 5.4ms  
image 59/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1238.jpg:  
224x224 malignant 0.86, benign 0.14, 4.9ms  
image 60/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1242.jpg:  
224x224 malignant 0.81, benign 0.19, 6.2ms  
image 61/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1251.jpg:  
224x224 malignant 0.97, benign 0.03, 3.9ms  
image 62/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1254.jpg:  
224x224 malignant 0.80, benign 0.20, 5.0ms  
image 63/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1256.jpg:  
224x224 malignant 0.63, benign 0.37, 4.7ms  
image 64/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1262.jpg:  
224x224 malignant 0.75, benign 0.25, 4.8ms  
image 65/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1266.jpg:  
224x224 benign 0.79, malignant 0.21, 4.5ms  
image 66/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1267.jpg:  
224x224 malignant 0.98, benign 0.02, 4.5ms  
image 67/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1268.jpg:  
224x224 malignant 0.83, benign 0.17, 4.9ms  
image 68/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1280.jpg:  
224x224 malignant 0.51, benign 0.49, 5.2ms  
image 69/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1286.jpg:  
224x224 malignant 0.70, benign 0.30, 5.2ms  
image 70/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1289.jpg:  
224x224 malignant 0.98, benign 0.02, 4.8ms  
image 71/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/129.jpg:  
224x224 malignant 0.96, benign 0.04, 4.6ms  
image 72/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1292.jpg:  
224x224 malignant 1.00, benign 0.00, 4.9ms  
image 73/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1295.jpg:  
224x224 benign 0.99, malignant 0.01, 4.7ms  
image 74/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1297.jpg:  
224x224 benign 0.54, malignant 0.46, 4.3ms  
image 75/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/13.jpg:  
224x224 malignant 0.96, benign 0.04, 5.3ms  
image 76/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1300.jpg:  
224x224 malignant 0.90, benign 0.10, 5.6ms  
image 77/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1310.jpg:  
224x224 benign 0.87, malignant 0.13, 6.4ms  
image 78/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1320.jpg:  
224x224 malignant 0.58, benign 0.42, 7.7ms  
image 79/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1322.jpg:  
224x224 malignant 0.77, benign 0.23, 6.6ms  
image 80/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1330.jpg:  
224x224 benign 0.59, malignant 0.41, 4.8ms  
image 81/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1333.jpg:  
224x224 malignant 0.57, benign 0.43, 4.6ms  
image 82/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1336.jpg:

224x224 malignant 0.66, benign 0.34, 4.2ms  
image 83/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1339.jpg:  
224x224 malignant 0.99, benign 0.01, 4.5ms  
image 84/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1342.jpg:  
224x224 benign 0.81, malignant 0.19, 5.0ms  
image 85/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1347.jpg:  
224x224 benign 0.71, malignant 0.29, 4.5ms  
image 86/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1354.jpg:  
224x224 malignant 1.00, benign 0.00, 4.3ms  
image 87/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1355.jpg:  
224x224 malignant 0.59, benign 0.41, 4.2ms  
image 88/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1358.jpg:  
224x224 malignant 0.92, benign 0.08, 4.2ms  
image 89/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1359.jpg:  
224x224 malignant 0.99, benign 0.01, 4.1ms  
image 90/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1364.jpg:  
224x224 malignant 0.96, benign 0.04, 4.3ms  
image 91/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1366.jpg:  
224x224 malignant 0.94, benign 0.06, 4.4ms  
image 92/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1370.jpg:  
224x224 malignant 0.99, benign 0.01, 4.1ms  
image 93/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1374.jpg:  
224x224 benign 0.62, malignant 0.38, 5.9ms  
image 94/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1378.jpg:  
224x224 malignant 0.90, benign 0.10, 4.5ms  
image 95/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1379.jpg:  
224x224 malignant 0.77, benign 0.23, 4.3ms  
image 96/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1380.jpg:  
224x224 benign 0.87, malignant 0.13, 4.7ms  
image 97/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1382.jpg:  
224x224 malignant 0.89, benign 0.11, 5.3ms  
image 98/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1383.jpg:  
224x224 malignant 0.77, benign 0.23, 4.4ms

image 99/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/139.jpg:  
224x224 malignant 0.99, benign 0.01, 5.3ms  
image 100/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1395.jpg:  
224x224 malignant 0.81, benign 0.19, 6.4ms  
image 101/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1401.jpg:  
224x224 malignant 0.51, benign 0.49, 5.4ms  
image 102/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1402.jpg:  
224x224 malignant 0.76, benign 0.24, 5.0ms  
image 103/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1417.jpg:  
224x224 malignant 0.98, benign 0.02, 5.4ms  
image 104/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1422.jpg:  
224x224 malignant 0.94, benign 0.06, 4.7ms  
image 105/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1425.jpg:  
224x224 malignant 0.99, benign 0.01, 4.7ms  
image 106/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1427.jpg:  
224x224 malignant 0.68, benign 0.32, 6.0ms  
image 107/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1430.jpg:  
224x224 malignant 0.99, benign 0.01, 4.7ms  
image 108/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1436.jpg:  
224x224 benign 0.58, malignant 0.42, 4.9ms  
image 109/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1438.jpg:  
224x224 benign 0.59, malignant 0.41, 4.9ms  
image 110/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1443.jpg:  
224x224 malignant 0.90, benign 0.10, 5.1ms  
image 111/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1447.jpg:  
224x224 malignant 0.66, benign 0.34, 5.3ms  
image 112/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1451.jpg:  
224x224 benign 0.66, malignant 0.34, 5.8ms  
image 113/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1461.jpg:  
224x224 benign 0.60, malignant 0.40, 5.5ms  
image 114/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1464.jpg:  
224x224 malignant 1.00, benign 0.00, 5.9ms  
image 115/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1484.jpg:  
224x224 malignant 0.67, benign 0.33, 5.6ms  
image 116/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1489.jpg:  
224x224 malignant 0.70, benign 0.30, 3.8ms  
image 117/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1495.jpg:  
224x224 malignant 0.99, benign 0.01, 3.2ms  
image 118/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/1499.jpg:  
224x224 malignant 0.95, benign 0.05, 4.0ms  
image 119/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/156.jpg:  
224x224 malignant 0.52, benign 0.48, 4.1ms  
image 120/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/161.jpg:  
224x224 malignant 0.97, benign 0.03, 4.2ms  
image 121/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/17.jpg:  
224x224 malignant 0.99, benign 0.01, 3.7ms  
image 122/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/173.jpg:  
224x224 malignant 0.74, benign 0.26, 3.8ms  
image 123/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/179.jpg:  
224x224 malignant 0.61, benign 0.39, 5.1ms  
image 124/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/182.jpg:  
224x224 malignant 0.99, benign 0.01, 4.3ms  
image 125/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/184.jpg:  
224x224 malignant 0.81, benign 0.19, 4.0ms  
image 126/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/185.jpg:  
224x224 malignant 0.75, benign 0.25, 4.2ms  
image 127/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/186.jpg:  
224x224 malignant 0.99, benign 0.01, 3.7ms  
image 128/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/190.jpg:  
224x224 malignant 0.99, benign 0.01, 5.2ms  
image 129/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/193.jpg:  
224x224 malignant 1.00, benign 0.00, 4.9ms  
image 130/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/195.jpg:  
224x224 malignant 1.00, benign 0.00, 4.0ms  
image 131/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/196.jpg:



224x224 malignant 0.99, benign 0.01, 3.9ms  
image 132/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/200.jpg:  
224x224 malignant 0.83, benign 0.17, 4.0ms  
image 133/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/208.jpg:  
224x224 malignant 0.94, benign 0.06, 2.9ms  
image 134/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/231.jpg:  
224x224 malignant 0.97, benign 0.03, 2.8ms  
image 135/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/232.jpg:  
224x224 malignant 0.98, benign 0.02, 2.8ms  
image 136/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/237.jpg:  
224x224 malignant 0.56, benign 0.44, 3.0ms  
image 137/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/238.jpg:  
224x224 malignant 0.69, benign 0.31, 3.1ms  
image 138/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/24.jpg:  
224x224 malignant 0.76, benign 0.24, 3.7ms  
image 139/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/247.jpg:  
224x224 malignant 0.97, benign 0.03, 3.9ms  
image 140/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/256.jpg:  
224x224 malignant 1.00, benign 0.00, 2.8ms  
image 141/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/257.jpg:  
224x224 malignant 0.99, benign 0.01, 2.9ms  
image 142/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/258.jpg:  
224x224 malignant 0.99, benign 0.01, 3.1ms  
image 143/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/260.jpg:  
224x224 malignant 0.89, benign 0.11, 2.9ms  
image 144/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/275.jpg:  
224x224 malignant 0.91, benign 0.09, 2.9ms  
image 145/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/276.jpg:  
224x224 malignant 0.98, benign 0.02, 3.2ms  
image 146/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/3.jpg:  
224x224 malignant 0.93, benign 0.07, 3.0ms  
image 147/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/303.jpg:  
224x224 malignant 0.93, benign 0.07, 3.0ms

image 148/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/307.jpg:  
224x224 malignant 1.00, benign 0.00, 3.4ms  
image 149/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/310.jpg:  
224x224 malignant 0.95, benign 0.05, 3.0ms  
image 150/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/317.jpg:  
224x224 malignant 0.97, benign 0.03, 2.9ms  
image 151/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/318.jpg:  
224x224 malignant 0.91, benign 0.09, 2.8ms  
image 152/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/322.jpg:  
224x224 malignant 0.95, benign 0.05, 3.1ms  
image 153/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/33.jpg:  
224x224 malignant 0.99, benign 0.01, 2.8ms  
image 154/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/338.jpg:  
224x224 malignant 0.99, benign 0.01, 2.9ms  
image 155/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/342.jpg:  
224x224 malignant 0.98, benign 0.02, 2.9ms  
image 156/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/343.jpg:  
224x224 malignant 1.00, benign 0.00, 5.0ms  
image 157/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/348.jpg:  
224x224 malignant 0.93, benign 0.07, 4.8ms  
image 158/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/355.jpg:  
224x224 malignant 0.86, benign 0.14, 3.0ms  
image 159/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/356.jpg:  
224x224 malignant 0.91, benign 0.09, 6.3ms  
image 160/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/360.jpg:  
224x224 malignant 0.85, benign 0.15, 3.0ms  
image 161/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/364.jpg:  
224x224 malignant 0.88, benign 0.12, 2.9ms  
image 162/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/375.jpg:  
224x224 malignant 0.86, benign 0.14, 2.9ms  
image 163/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/381.jpg:  
224x224 malignant 0.97, benign 0.03, 3.0ms  
image 164/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/382.jpg:

224x224 malignant 0.92, benign 0.08, 5.1ms  
image 165/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/384.jpg:  
224x224 malignant 0.87, benign 0.13, 3.6ms  
image 166/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/389.jpg:  
224x224 malignant 1.00, benign 0.00, 3.4ms  
image 167/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/39.jpg:  
224x224 malignant 0.98, benign 0.02, 2.8ms  
image 168/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/390.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 169/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/394.jpg:  
224x224 malignant 1.00, benign 0.00, 3.0ms  
image 170/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/399.jpg:  
224x224 malignant 0.98, benign 0.02, 3.2ms  
image 171/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/4.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 172/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/402.jpg:  
224x224 malignant 0.97, benign 0.03, 2.9ms  
image 173/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/405.jpg:  
224x224 benign 0.76, malignant 0.24, 3.0ms  
image 174/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/407.jpg:  
224x224 malignant 0.92, benign 0.08, 2.8ms  
image 175/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/409.jpg:  
224x224 malignant 0.98, benign 0.02, 3.3ms  
image 176/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/419.jpg:  
224x224 malignant 0.82, benign 0.18, 3.1ms  
image 177/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/421.jpg:  
224x224 malignant 0.94, benign 0.06, 4.7ms  
image 178/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/424.jpg:  
224x224 malignant 0.93, benign 0.07, 3.9ms  
image 179/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/426.jpg:  
224x224 malignant 0.96, benign 0.04, 3.0ms  
image 180/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/428.jpg:  
224x224 malignant 0.94, benign 0.06, 3.1ms

image 181/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/430.jpg:  
224x224 malignant 0.87, benign 0.13, 2.8ms  
image 182/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/436.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 183/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/437.jpg:  
224x224 malignant 1.00, benign 0.00, 5.3ms  
image 184/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/44.jpg:  
224x224 malignant 0.99, benign 0.01, 4.5ms  
image 185/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/445.jpg:  
224x224 malignant 1.00, benign 0.00, 4.5ms  
image 186/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/450.jpg:  
224x224 malignant 1.00, benign 0.00, 4.3ms  
image 187/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/459.jpg:  
224x224 malignant 1.00, benign 0.00, 4.7ms  
image 188/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/46.jpg:  
224x224 malignant 0.97, benign 0.03, 3.9ms  
image 189/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/463.jpg:  
224x224 malignant 1.00, benign 0.00, 4.1ms  
image 190/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/474.jpg:  
224x224 malignant 1.00, benign 0.00, 4.0ms  
image 191/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/479.jpg:  
224x224 malignant 1.00, benign 0.00, 3.9ms  
image 192/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/483.jpg:  
224x224 malignant 0.99, benign 0.01, 4.1ms  
image 193/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/501.jpg:  
224x224 malignant 0.80, benign 0.20, 6.6ms  
image 194/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/504.jpg:  
224x224 malignant 1.00, benign 0.00, 4.1ms  
image 195/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/507.jpg:  
224x224 malignant 1.00, benign 0.00, 4.1ms  
image 196/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/508.jpg:  
224x224 malignant 1.00, benign 0.00, 4.2ms  
image 197/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/511.jpg:  
224x224 malignant 0.84, benign 0.16, 4.0ms  
image 198/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/519.jpg:  
224x224 malignant 1.00, benign 0.00, 7.0ms  
image 199/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/52.jpg:  
224x224 malignant 0.83, benign 0.17, 3.9ms  
image 200/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/528.jpg:  
224x224 malignant 1.00, benign 0.00, 3.1ms  
image 201/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/536.jpg:  
224x224 malignant 1.00, benign 0.00, 3.4ms  
image 202/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/54.jpg:  
224x224 malignant 0.96, benign 0.04, 3.1ms  
image 203/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/546.jpg:  
224x224 malignant 0.96, benign 0.04, 2.9ms  
image 204/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/554.jpg:  
224x224 malignant 1.00, benign 0.00, 3.5ms  
image 205/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/556.jpg:  
224x224 malignant 0.89, benign 0.11, 3.1ms  
image 206/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/562.jpg:  
224x224 malignant 0.98, benign 0.02, 2.9ms  
image 207/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/568.jpg:  
224x224 malignant 0.94, benign 0.06, 3.0ms  
image 208/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/57.jpg:  
224x224 malignant 0.97, benign 0.03, 3.3ms  
image 209/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/570.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 210/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/572.jpg:  
224x224 malignant 1.00, benign 0.00, 3.1ms  
image 211/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/573.jpg:  
224x224 malignant 0.97, benign 0.03, 2.9ms  
image 212/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/575.jpg:  
224x224 malignant 1.00, benign 0.00, 3.0ms  
image 213/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/58.jpg:

224x224 malignant 0.98, benign 0.02, 3.1ms  
image 214/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/590.jpg:  
224x224 malignant 1.00, benign 0.00, 4.3ms  
image 215/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/592.jpg:  
224x224 malignant 1.00, benign 0.00, 3.1ms  
image 216/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/593.jpg:  
224x224 malignant 1.00, benign 0.00, 3.0ms  
image 217/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/596.jpg:  
224x224 malignant 0.98, benign 0.02, 3.9ms  
image 218/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/602.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 219/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/603.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 220/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/614.jpg:  
224x224 malignant 1.00, benign 0.00, 5.8ms  
image 221/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/615.jpg:  
224x224 malignant 1.00, benign 0.00, 5.2ms  
image 222/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/619.jpg:  
224x224 malignant 0.98, benign 0.02, 2.9ms  
image 223/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/62.jpg:  
224x224 malignant 0.85, benign 0.15, 2.8ms  
image 224/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/628.jpg:  
224x224 malignant 0.99, benign 0.01, 2.9ms  
image 225/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/638.jpg:  
224x224 malignant 1.00, benign 0.00, 2.9ms  
image 226/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/641.jpg:  
224x224 malignant 1.00, benign 0.00, 3.0ms  
image 227/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/643.jpg:  
224x224 malignant 1.00, benign 0.00, 2.7ms  
image 228/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/65.jpg:  
224x224 malignant 0.58, benign 0.42, 2.9ms  
image 229/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/653.jpg:  
224x224 malignant 0.98, benign 0.02, 3.0ms

image 230/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/658.jpg:  
224x224 malignant 1.00, benign 0.00, 3.0ms  
image 231/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/66.jpg:  
224x224 malignant 0.99, benign 0.01, 2.9ms  
image 232/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/660.jpg:  
224x224 malignant 0.96, benign 0.04, 3.1ms  
image 233/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/667.jpg:  
224x224 malignant 0.95, benign 0.05, 3.0ms  
image 234/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/670.jpg:  
224x224 malignant 1.00, benign 0.00, 3.1ms  
image 235/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/674.jpg:  
224x224 malignant 0.74, benign 0.26, 2.9ms  
image 236/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/679.jpg:  
224x224 malignant 1.00, benign 0.00, 3.1ms  
image 237/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/68.jpg:  
224x224 malignant 0.97, benign 0.03, 4.7ms  
image 238/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/686.jpg:  
224x224 malignant 0.92, benign 0.08, 3.0ms  
image 239/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/694.jpg:  
224x224 malignant 0.98, benign 0.02, 2.8ms  
image 240/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/696.jpg:  
224x224 malignant 0.85, benign 0.15, 3.2ms  
image 241/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/706.jpg:  
224x224 malignant 0.96, benign 0.04, 3.8ms  
image 242/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/709.jpg:  
224x224 malignant 0.93, benign 0.07, 7.6ms  
image 243/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/713.jpg:  
224x224 malignant 0.96, benign 0.04, 3.0ms  
image 244/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/73.jpg:  
224x224 malignant 0.98, benign 0.02, 3.4ms  
image 245/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/735.jpg:  
224x224 malignant 0.99, benign 0.01, 3.0ms  
image 246/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/739.jpg:  
224x224 malignant 0.99, benign 0.01, 4.4ms  
image 247/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/74.jpg:  
224x224 malignant 0.90, benign 0.10, 4.8ms  
image 248/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/744.jpg:  
224x224 malignant 0.96, benign 0.04, 4.5ms  
image 249/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/747.jpg:  
224x224 malignant 0.99, benign 0.01, 4.6ms  
image 250/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/749.jpg:  
224x224 malignant 1.00, benign 0.00, 4.4ms  
image 251/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/757.jpg:  
224x224 malignant 1.00, benign 0.00, 3.8ms  
image 252/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/759.jpg:  
224x224 malignant 0.94, benign 0.06, 3.5ms  
image 253/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/762.jpg:  
224x224 malignant 1.00, benign 0.00, 3.4ms  
image 254/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/763.jpg:  
224x224 malignant 0.99, benign 0.01, 3.9ms  
image 255/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/771.jpg:  
224x224 malignant 0.99, benign 0.01, 5.2ms  
image 256/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/773.jpg:  
224x224 malignant 1.00, benign 0.00, 3.8ms  
image 257/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/778.jpg:  
224x224 malignant 1.00, benign 0.00, 4.0ms  
image 258/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/792.jpg:  
224x224 malignant 1.00, benign 0.00, 4.3ms  
image 259/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/794.jpg:  
224x224 malignant 0.97, benign 0.03, 4.0ms  
image 260/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/797.jpg:  
224x224 malignant 1.00, benign 0.00, 5.0ms  
image 261/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/8.jpg:  
224x224 malignant 0.99, benign 0.01, 3.8ms  
image 262/300 /content/drive/MyDrive/Deep

Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/804.jpg:



224x224 malignant 1.00, benign 0.00, 4.2ms  
image 263/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/808.jpg:  
224x224 malignant 1.00, benign 0.00, 4.8ms  
image 264/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/81.jpg:  
224x224 malignant 0.99, benign 0.01, 2.7ms  
image 265/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/817.jpg:  
224x224 malignant 0.99, benign 0.01, 4.0ms  
image 266/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/822.jpg:  
224x224 malignant 0.98, benign 0.02, 2.7ms  
image 267/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/826.jpg:  
224x224 malignant 0.92, benign 0.08, 2.9ms  
image 268/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/832.jpg:  
224x224 malignant 0.71, benign 0.29, 3.0ms  
image 269/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/836.jpg:  
224x224 malignant 0.99, benign 0.01, 2.9ms  
image 270/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/838.jpg:  
224x224 malignant 0.95, benign 0.05, 2.8ms  
image 271/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/839.jpg:  
224x224 malignant 0.77, benign 0.23, 2.9ms  
image 272/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/85.jpg:  
224x224 malignant 0.79, benign 0.21, 2.9ms  
image 273/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/852.jpg:  
224x224 malignant 0.84, benign 0.16, 3.2ms  
image 274/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/859.jpg:  
224x224 benign 0.69, malignant 0.31, 2.9ms  
image 275/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/864.jpg:  
224x224 malignant 0.87, benign 0.13, 6.4ms  
image 276/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/866.jpg:  
224x224 benign 0.77, malignant 0.23, 3.3ms  
image 277/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/868.jpg:  
224x224 benign 0.62, malignant 0.38, 3.7ms  
image 278/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/87.jpg:  
224x224 malignant 1.00, benign 0.00, 4.8ms

image 279/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/871.jpg:  
224x224 malignant 0.83, benign 0.17, 2.9ms  
image 280/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/874.jpg:  
224x224 malignant 0.71, benign 0.29, 2.9ms  
image 281/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/881.jpg:  
224x224 malignant 0.79, benign 0.21, 3.0ms  
image 282/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/887.jpg:  
224x224 malignant 0.84, benign 0.16, 3.0ms  
image 283/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/893.jpg:  
224x224 malignant 0.93, benign 0.07, 2.9ms  
image 284/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/894.jpg:  
224x224 malignant 0.97, benign 0.03, 2.9ms  
image 285/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/905.jpg:  
224x224 benign 0.77, malignant 0.23, 4.8ms  
image 286/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/91.jpg:  
224x224 malignant 0.98, benign 0.02, 3.6ms  
image 287/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/92.jpg:  
224x224 malignant 0.98, benign 0.02, 3.6ms  
image 288/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/927.jpg:  
224x224 malignant 1.00, benign 0.00, 3.2ms  
image 289/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/93.jpg:  
224x224 malignant 0.62, benign 0.38, 2.8ms  
image 290/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/934.jpg:  
224x224 malignant 0.59, benign 0.41, 2.7ms  
image 291/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/937.jpg:  
224x224 benign 0.82, malignant 0.18, 5.1ms  
image 292/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/940.jpg:  
224x224 malignant 0.80, benign 0.20, 3.0ms  
image 293/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/947.jpg:  
224x224 benign 0.75, malignant 0.25, 3.1ms  
image 294/300 /content/drive/MyDrive/Deep  
Learning/Skin\_Classi\_Final\_Project/DataSet/test/malignant/948.jpg:  
224x224 malignant 0.92, benign 0.08, 2.9ms  
image 295/300 /content/drive/MyDrive/Deep

```
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/949.jpg:
224x224 malignant 0.99, benign 0.01, 3.9ms
image 296/300 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/953.jpg:
224x224 benign 0.59, malignant 0.41, 3.0ms
image 297/300 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/985.jpg:
224x224 malignant 1.00, benign 0.00, 3.0ms
image 298/300 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/992.jpg:
224x224 malignant 0.77, benign 0.23, 2.8ms
image 299/300 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/994.jpg:
224x224 malignant 0.87, benign 0.13, 2.9ms
image 300/300 /content/drive/MyDrive/Deep
Learning/Skin_Classi_Final_Project/DataSet/test/malignant/995.jpg:
224x224 malignant 0.86, benign 0.14, 3.1ms
Speed: 2.4ms preprocess, 4.1ms inference, 0.1ms postprocess per image
at shape (1, 3, 224, 224)
```

Results saved to runs/classify/train513

Performing ResNet Predictions...

Found 660 images belonging to 2 classes.

```
1/1 _____ 0s 42ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 40ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 38ms/step
1/1 _____ 0s 39ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 34ms/step
1/1 _____ 0s 41ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 32ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 33ms/step
1/1 _____ 0s 35ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 31ms/step
1/1 _____ 0s 29ms/step
```

*# Step 3: Combine YOLOv8 and ResNet Predictions (Ensemble Learning)*  
*print("Performing Ensemble Predictions...")*

```
final_predictions = []
for yolo_prob, resnet_class in zip(yolo_probs, resnet_classes):
    yolo_class_prob = yolo_prob.data[1].item() # Access the raw
```

```

tensor and get the class 1 probability
resnet_class_prob = resnet_class[0] # Class 1 prediction from
ResNet

# Majority Voting: If the sum of both predictions is greater than
1, choose class 1
final_pred = 1 if yolo_class_prob + resnet_class_prob > 1 else 0
final_predictions.append(final_pred)

# Output final ensemble predictions
print("Final Ensemble Predictions:", final_predictions)

```

Performing Ensemble Predictions...

```

Final Ensemble Predictions: [1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0,
1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0,
0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1,
1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0,
0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1,
0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0,
1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1,
0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 1,
0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0,
0, 0, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1,
0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0,
1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 0,
0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1,
0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0,
1, 1, 1, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 0, 1, 1,
1, 0, 1, 1, 1, 1, 1, 1, 1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 1,
0, 1, 1, 1, 0, 1, 1, 1, 0, 1, 0, 0, 1, 1, 1, 1, 1, 1, 0, 0, 1, 0, 1,
1, 0, 0, 1, 0, 1, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0,
1, 1, 1, 0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1,
0, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1,
1, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 0, 1, 1, 1, 1, 0, 1, 0, 0, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0,
1, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1,
0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 1, 1,
1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0, 0, 1, 0, 1,
1, 1, 1, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 1, 0,
0, 1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1,
1, 1]

```

```

# Step 1: Upload the image manually
from PIL import Image
import numpy as np

# Open the image and resize it
image = Image.open('/content/drive/MyDrive/Deep

```

```

Learning/Skin_Classi_Final_Project/DataSet/test/benign/1473.jpg')
image_resized = image.resize((224, 224)) # Resize to 224x224 for
ResNet and YOLOv8 compatibility

# Step 2: Make predictions using the YOLOv8 model
yolo_results = model_yolo.predict(image_resized) # Predict using
YOLOv8 model

# Class labels mapping (adjust if necessary)
class_labels = {0: "benign", 1: "malignant"}

# Extract the class probabilities from YOLOv8 result
yolo_class_prob = yolo_probs[0].data.cpu().numpy()[1] # Assuming
binary classification, class 1 (malignant) is at index 1

# Step 3: Make predictions using the ResNet model
from tensorflow.keras.preprocessing import image as tf_image

# Convert PIL image to numpy array for ResNet prediction
img_array = tf_image.img_to_array(image_resized)
img_array = np.expand_dims(img_array, axis=0) # Add batch dimension
img_array /= 255.0 # Normalize

# Make ResNet prediction
resnet_pred = model_resnet.predict(img_array)

# Check if the prediction is a scalar or probabilities
if resnet_pred.shape[1] == 1:
    resnet_class_prob = resnet_pred[0][0] # If it's a scalar, use the
value directly
else:
    resnet_class_prob = resnet_pred[0][1] # Otherwise, use class 1
(malignant) probability

# Step 4: Ensemble Learning (Majority Voting)
final_pred = 1 if yolo_class_prob + resnet_class_prob > 1 else 0

# Step 5: Display Results
yolo_class_name = class_labels[1 if yolo_class_prob > 0.5 else 0]
resnet_class_name = class_labels[1 if resnet_class_prob > 0.5 else 0]
final_class_name = class_labels[final_pred]

print(f"YOLOv8 Prediction: {yolo_class_name}, Probability:
{yolo_class_prob}")
print(f"ResNet Prediction: {resnet_class_name}, Probability:
{resnet_class_prob}")
print(f"Ensemble Prediction: {final_class_name}")

# Show the uploaded image

```

```
image_resized.show()
```

```
0: 224x224 benign 1.00, malignant 0.00, 5.6ms  
Speed: 3.1ms preprocess, 5.6ms inference, 0.1ms postprocess per image  
at shape (1, 3, 224, 224)  
1/1 _____ 0s 24ms/step  
YOLOv8 Prediction: malignant, Probability: 0.9812726974487305  
ResNet Prediction: benign, Probability: 0.32417887449264526  
Ensemble Prediction: malignant
```

```
# Step 7: Save and Export Results
```

```
print("Saving YOLOv8 Trained Model...")
```

```
!mkdir -p /content/models
```

```
model_yolo_path = '/content/models/yolov8n_cls.pt'
```

```
!cp /content/runs/classify/train/weights/best.pt $model_yolo_path
```

```
print("Saving ResNet Model...")
```

```
model_resnet.save('/content/models/resnet_model.h5')
```

```
print("Models saved in /content/models!")
```

```
# Download Models
```

```
from google.colab import files
```

```
files.download(model_yolo_path)
```

```
files.download('/content/models/resnet_model.h5')
```