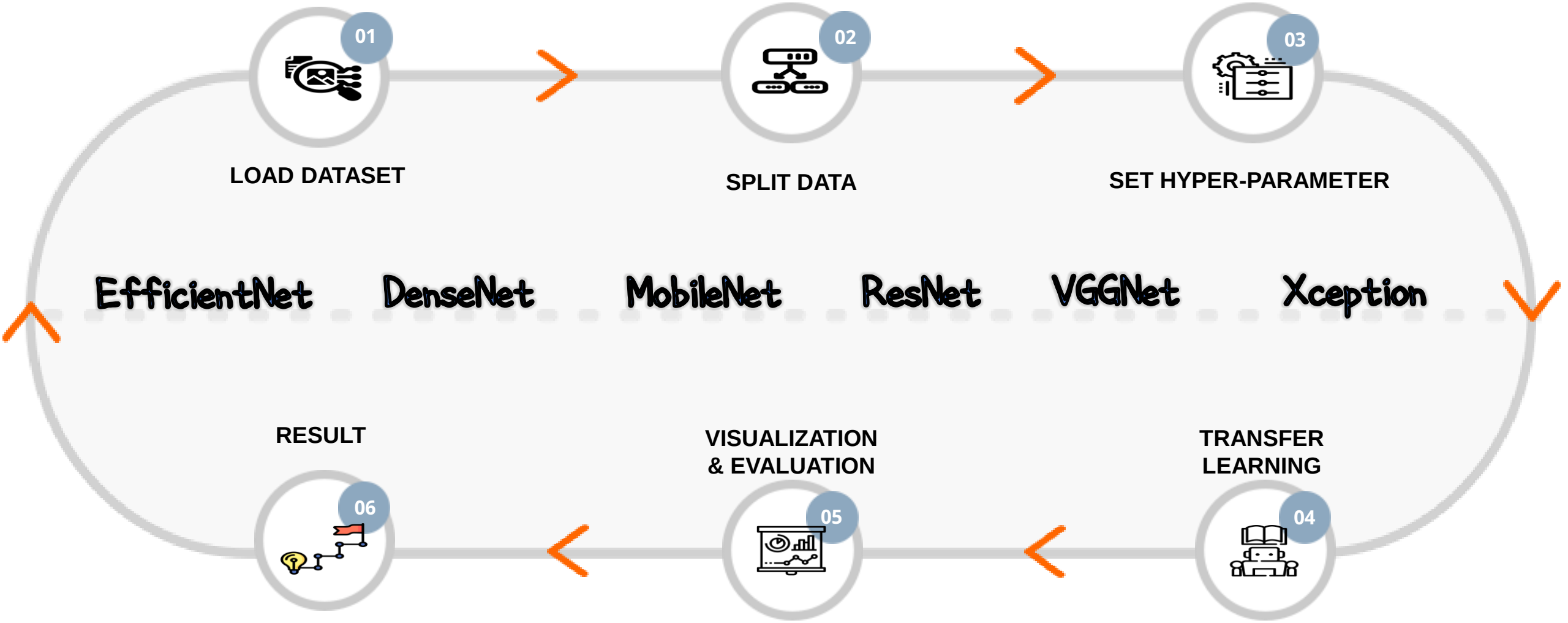
Leukemia Image Classification

- TRANSFER LEARNING
- HYPER PARAMETER TUNING


Outline

1. Outline


01
LOAD DATASET
02
SPLIT DATA
03
SET HYPER-PARAMETER
EfficientNet
DenseNet
MobileNet
ResNet
VGGNet
Xception
RESULT
06
VISUALIZATION
& EVALUATION
05
TRANSFER
LEARNING
04

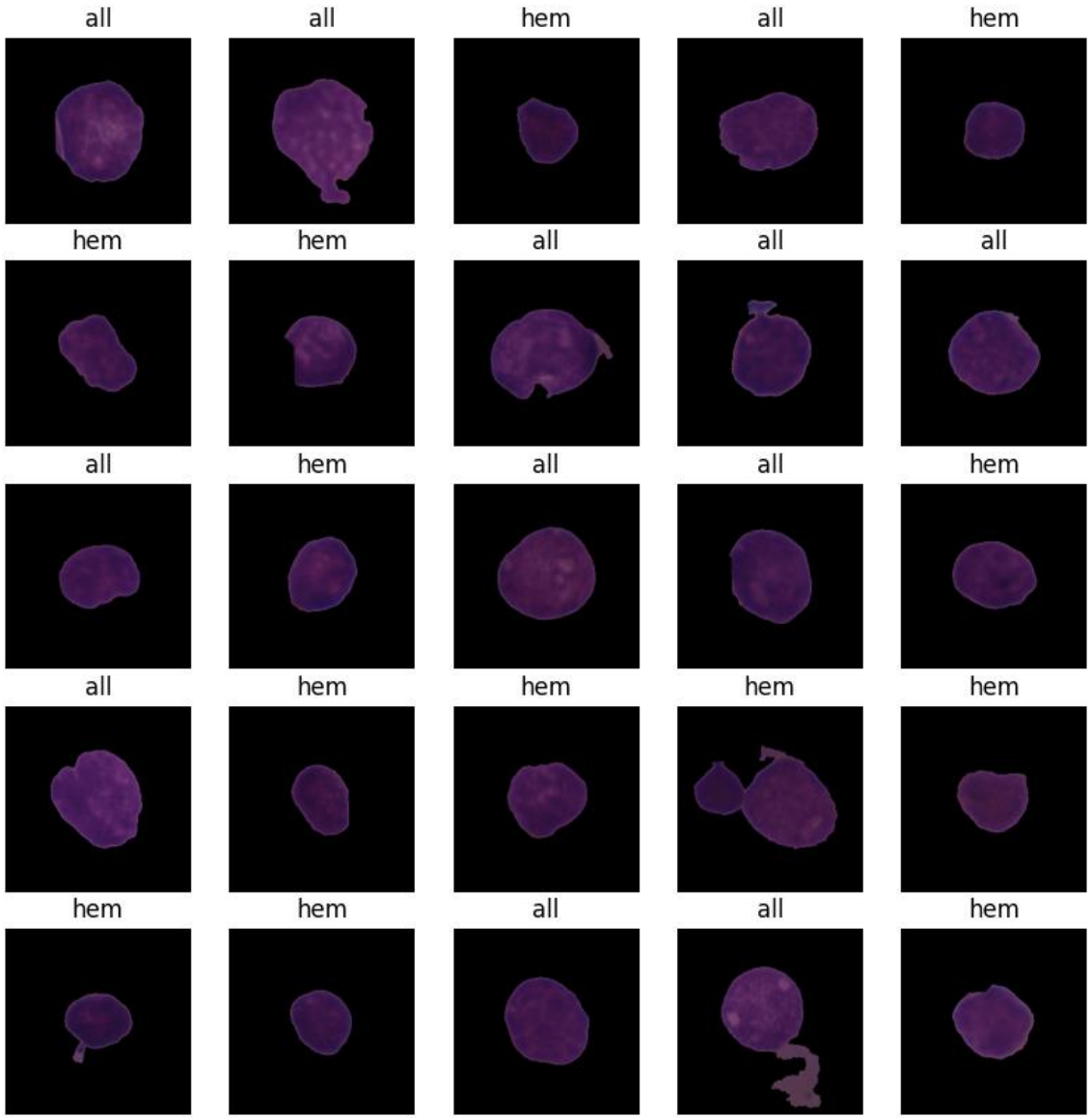

Dataset

2. DATASET :

LEUKEMIA IMAGE CLASSIFICATION

ALL VS HEM

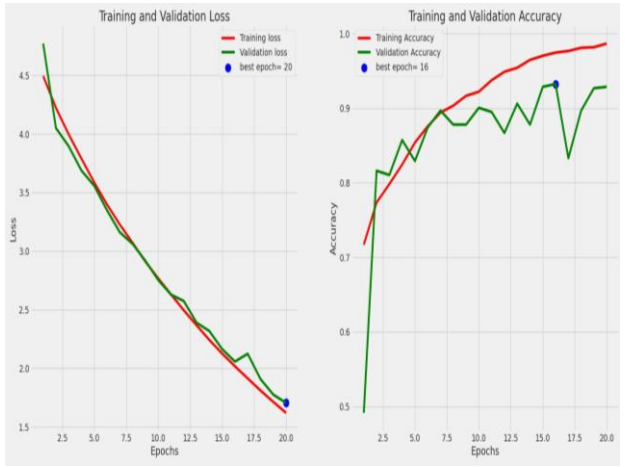
- ALL : Leukemia blasts
- HEM : Normal Blood Cells



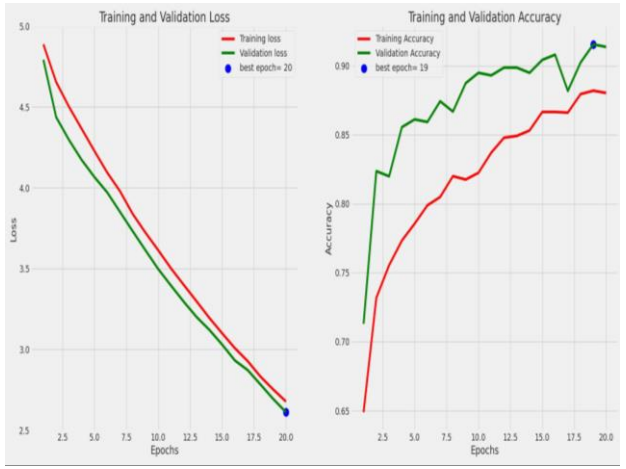
ALL (Leukemia blasts) VS HEM (Normal Blood Cells)


Results

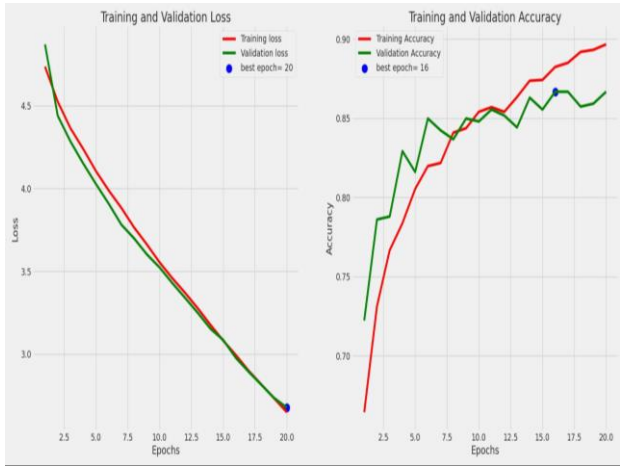
3. Results : Loss and Accuracy



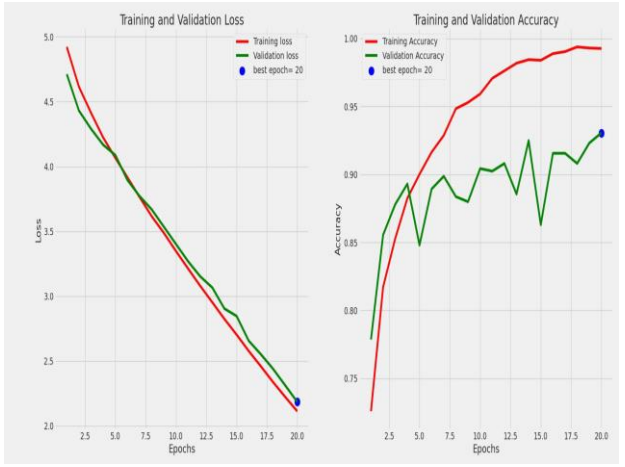
DenseNet121



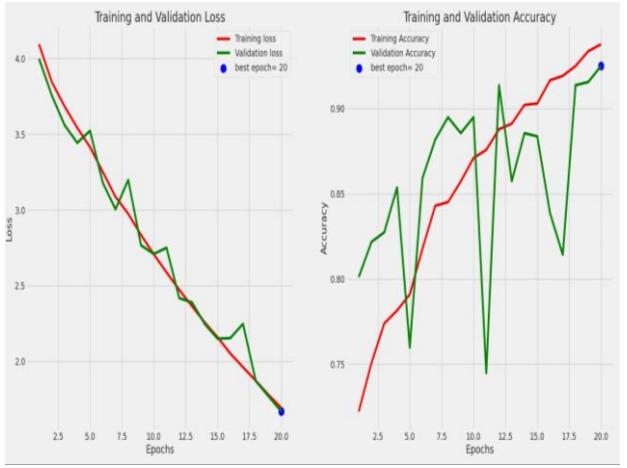
EfficientNetB1



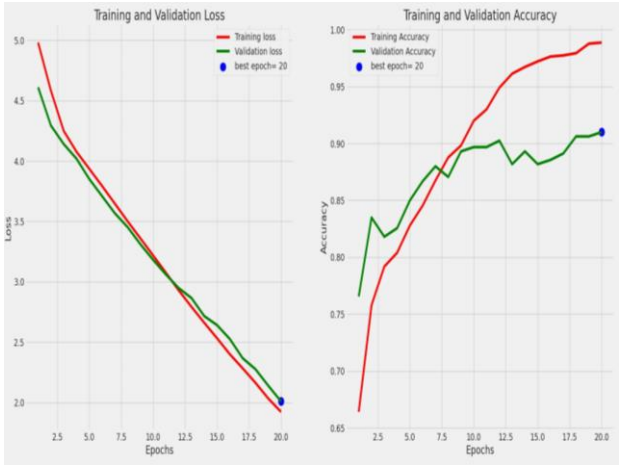
MobileNet



ResNet50



VGG19



Xception

3. Results : Classification Report

Classification Report:

	precision	recall	f1-score	support
all	0.9394	0.9368	0.9381	364
hem	0.8655	0.8706	0.8680	170
accuracy			0.9157	534
macro avg	0.9024	0.9037	0.9031	534
weighted avg	0.9159	0.9157	0.9158	534

DenseNet121

Classification Report:

	precision	recall	f1-score	support
all	0.9345	0.9011	0.9175	364
hem	0.8033	0.8647	0.8329	170
accuracy			0.8895	534
macro avg	0.8689	0.8829	0.8752	534
weighted avg	0.8927	0.8895	0.8905	534

EfficientNetB1

Classification Report:

	precision	recall	f1-score	support
all	0.9032	0.9231	0.9130	364
hem	0.8272	0.7882	0.8072	170
accuracy			0.8801	534
macro avg	0.8652	0.8557	0.8601	534
weighted avg	0.8790	0.8801	0.8794	534

MobileNet

Classification Report:

	precision	recall	f1-score	support
all	0.9339	0.9698	0.9515	364
hem	0.9295	0.8529	0.8896	170
accuracy			0.9326	534
macro avg	0.9317	0.9114	0.9205	534
weighted avg	0.9325	0.9326	0.9318	534

ResNet50

Classification Report:

	precision	recall	f1-score	support
all	0.9489	0.9176	0.9330	364
hem	0.8352	0.8941	0.8636	170
accuracy			0.9101	534
macro avg	0.8920	0.9059	0.8983	534
weighted avg	0.9127	0.9101	0.9109	534

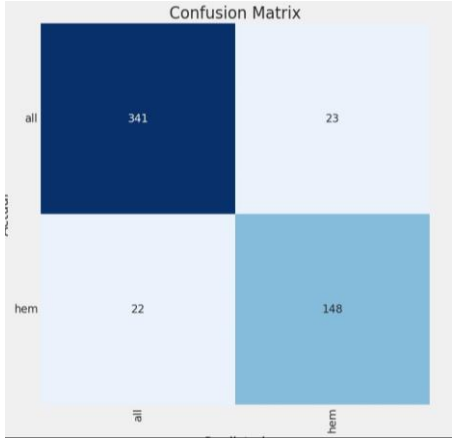
VGG19

Classification Report:

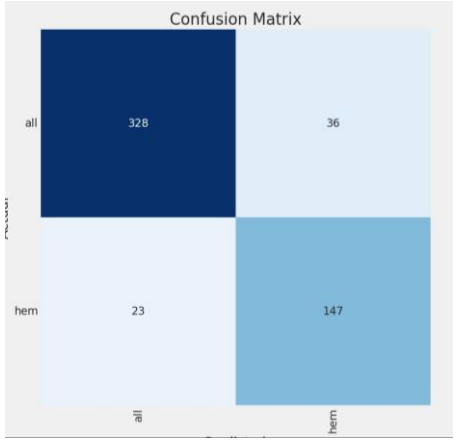
	precision	recall	f1-score	support
all	0.9096	0.9396	0.9243	364
hem	0.8608	0.8000	0.8293	170
accuracy			0.8951	534
macro avg	0.8852	0.8698	0.8768	534
weighted avg	0.8940	0.8951	0.8941	534

Xception

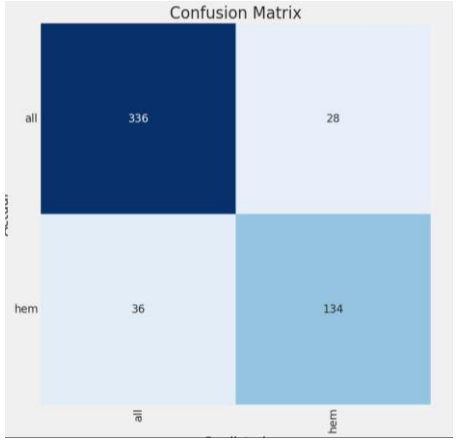
3. Results : Confusion Matrix



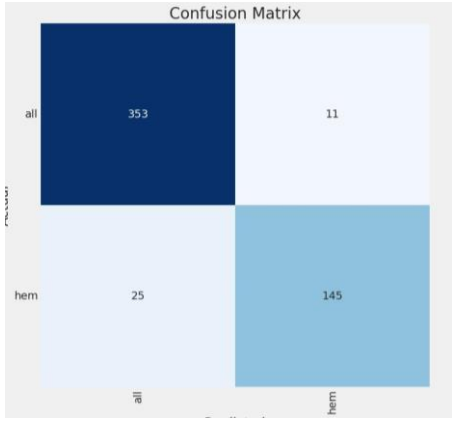
DenseNet121



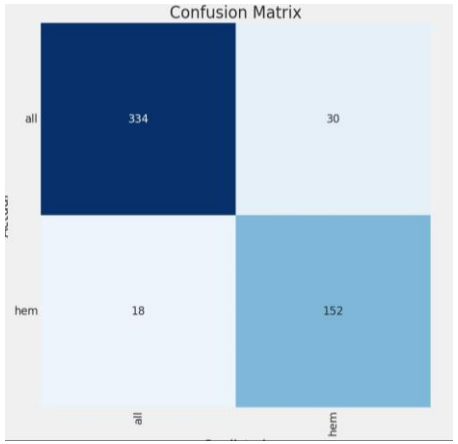
EfficientNEtB1



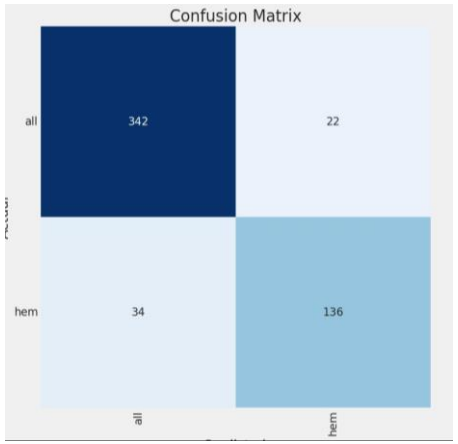
MobileNet



ResNet50



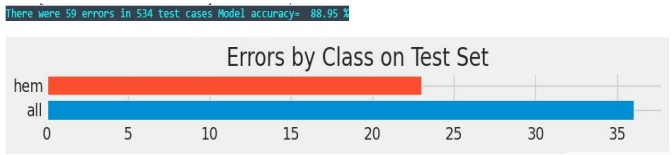
VGG19



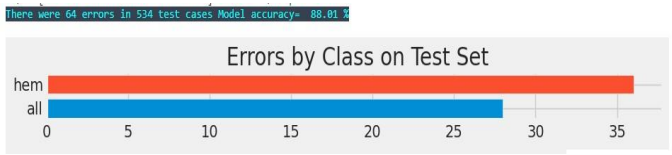
Xception

3. Results : Number of Errors

DenseNet121

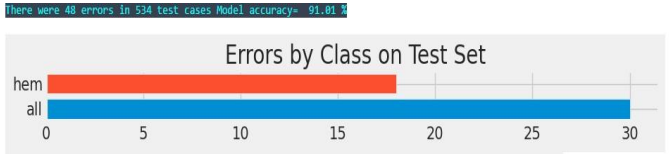


EfficientNEtB1



MobileNet

ResNet50



VGG19

Xception


Analyzation

4. Analyzation : Loss and Accuracy

- Result Analysis 1 : Loss and Accuracy
- Training Loss and Accuracy, Evaluation Loss and Accuracy for each model
- Top 3 Models : ResNet50, DenseNet121, VGGNet19

	Train_Loss	Eval_Loss	Train_Accuracy	Eval_Accuracy
DenseNet121	1.6205	1.7057	0.9867	0.9287
MobileNet	2.6480	2.6754	0.8967	0.8668
EfficientNetB1	2.6775	2.6113	0.8803	0.9137
ResNet50	2.1126	2.1845	0.9926	0.9306
VGGNet19	1.6934	1.6692	0.9377	0.9250
Xception	1.9231	2.0096	0.9887	0.9099

Results : Loss and Accuracy

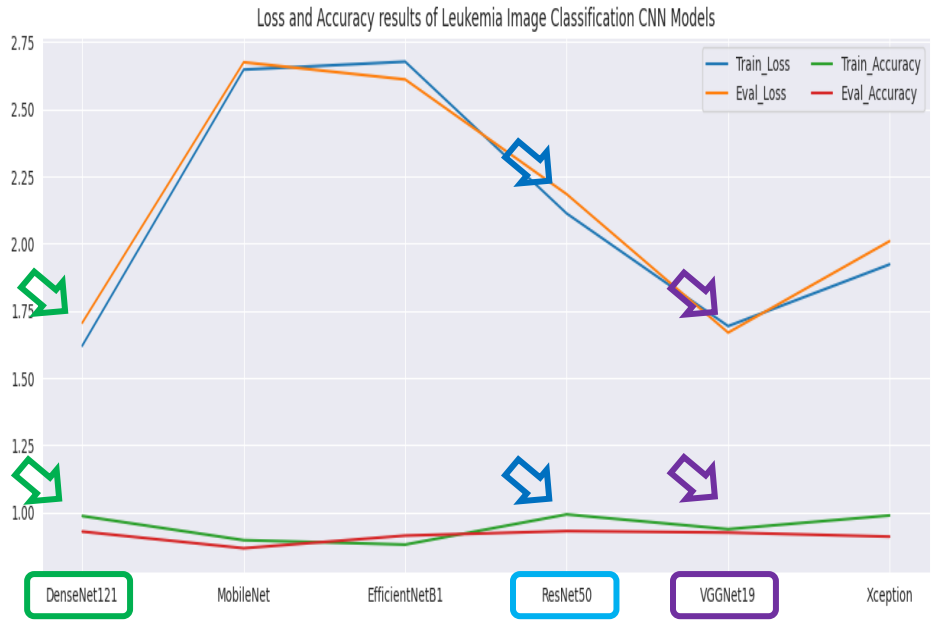
- Result Analysis 2 : Precision, Recall, F1-Score
- Precision, Recall, F1-Score of ALL vs Precision, Recall, F1-Score of HEM
- Top 3 Models : ResNet50, DenseNet121, VGGNet19

	Precision(ALL)	Recall(ALL)	F1-Score(ALL)	Precision(HEM)	Recall(HEM)	F1-Score(HEM)
DenseNet121	0.9394	0.9368	0.9381	0.8655	0.8706	0.8680
MobileNet	0.9032	0.9231	0.9130	0.8272	0.7882	0.8072
EfficientNetB1	0.9345	0.9011	0.9175	0.8033	0.8647	0.8329
ResNet50	0.9339	0.9698	0.9515	0.9295	0.8529	0.8896
VGGNet19	0.9489	0.9176	0.9330	0.8352	0.8941	0.8636
Xception	0.9096	0.9396	0.9243	0.8608	0.8000	0.8293

Results : Precision, Recall, F1-score (ALL & HEM)

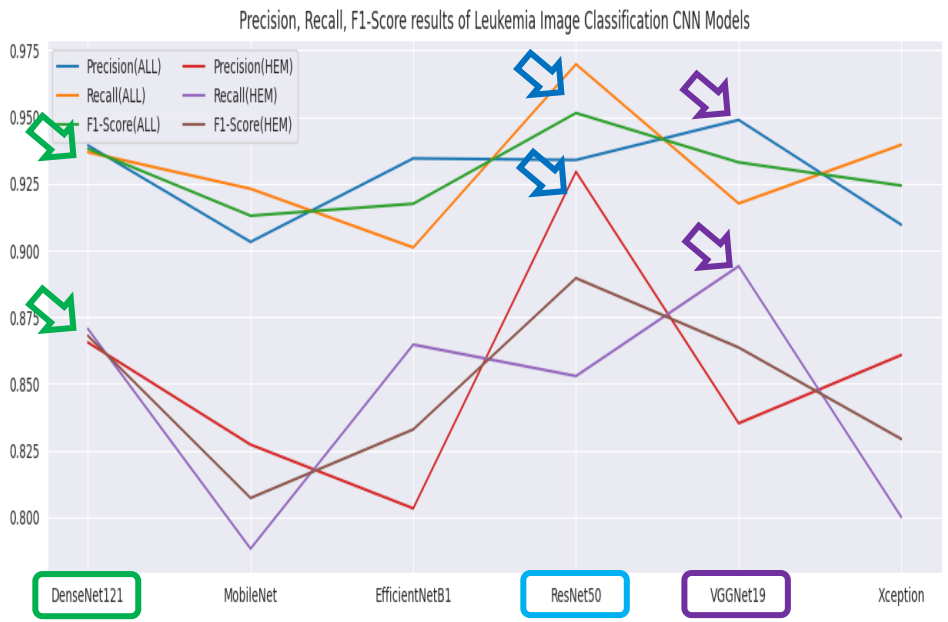
4. Analyzation : Loss and Accuracy

- Result Analysis 1 : Loss and Accuracy
- Top 3 Models : ResNet50, DenseNet121, VGGNet19



Results : Loss and Accuracy

- Result Analysis 2 : Precision, Recall, F1-Score
- Top 3 Models : ResNet50, DenseNet121, VGGNet19



Results : Precision, Recall, F1-score

THANK YOU

Contacts

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