GOOGLENET MODEL ENHANCEMENT USING LEARNING RATE SCHEDULES

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Introduction to Deep Learning (364-2-1071)

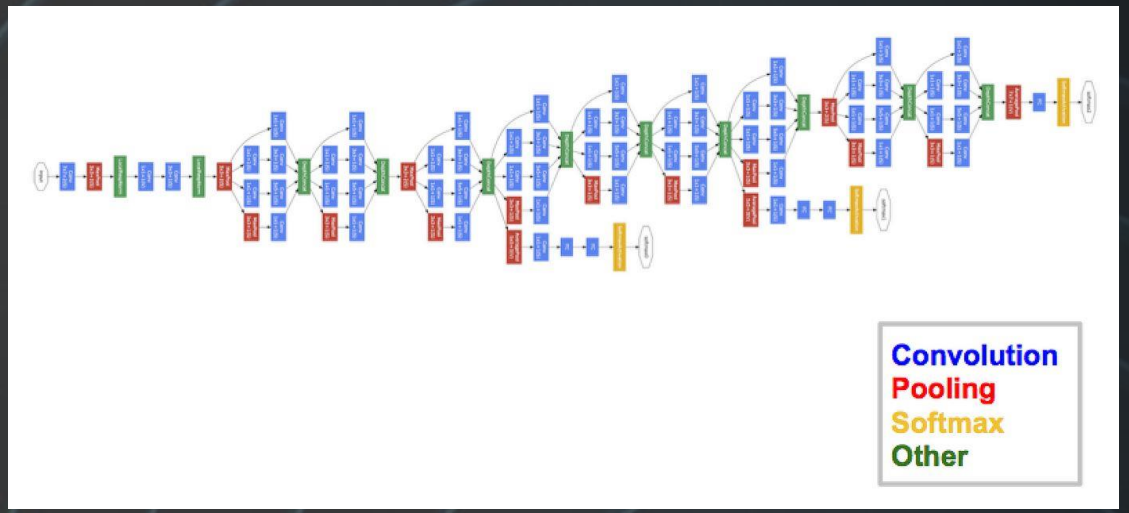
Semester B, 2023

GOOGLENET MODEL & PROJECT GOAL

GoogleNet

Deep CNN Architecture

Inception mechanism

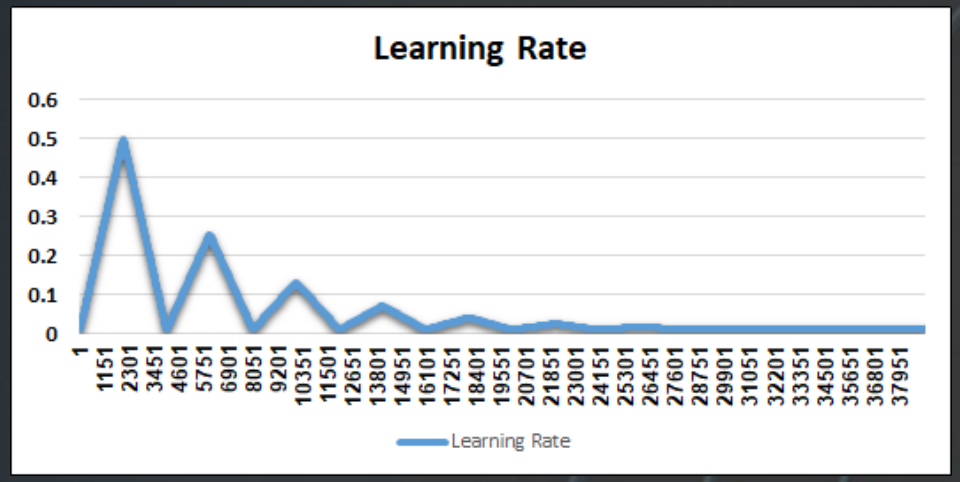


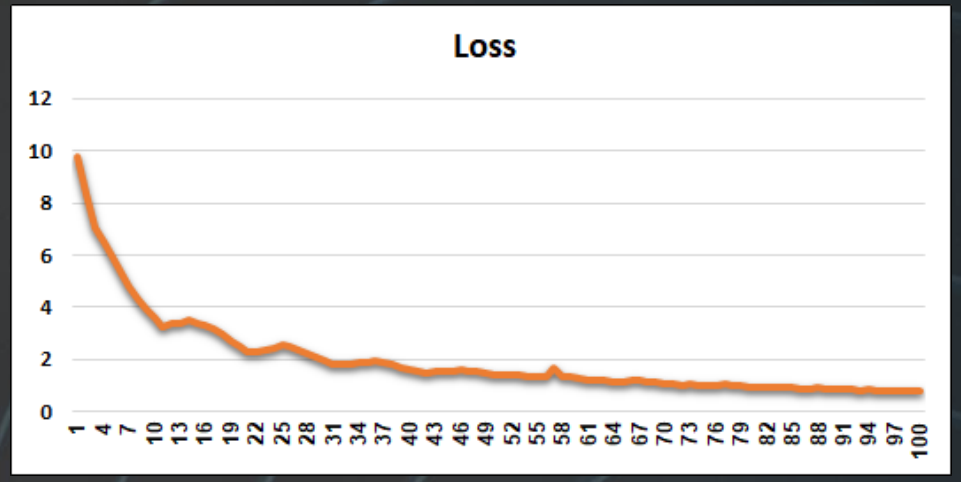
Project Goal

Improve the generalization capability of the standard GoogleNet model, by tuning its learning rate parameter with Learning Rate Schedule methods

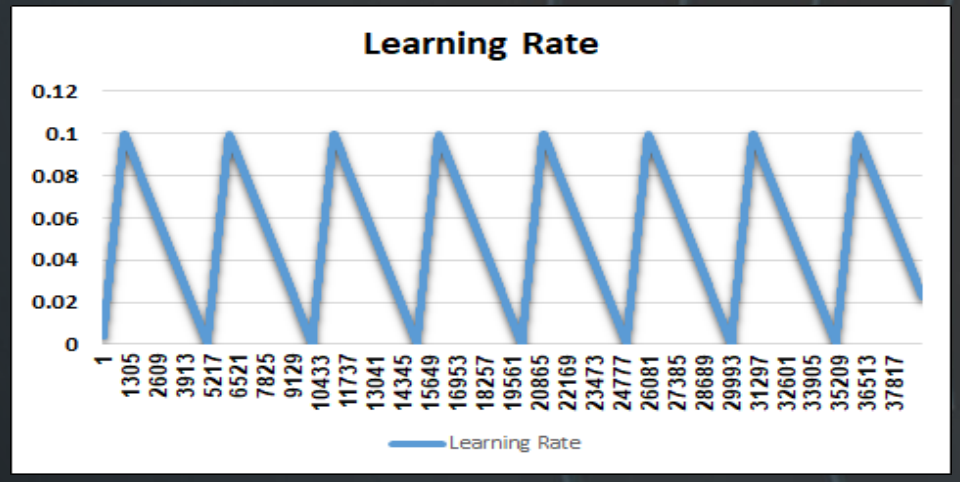
CYCLICAL LEARNING RATE

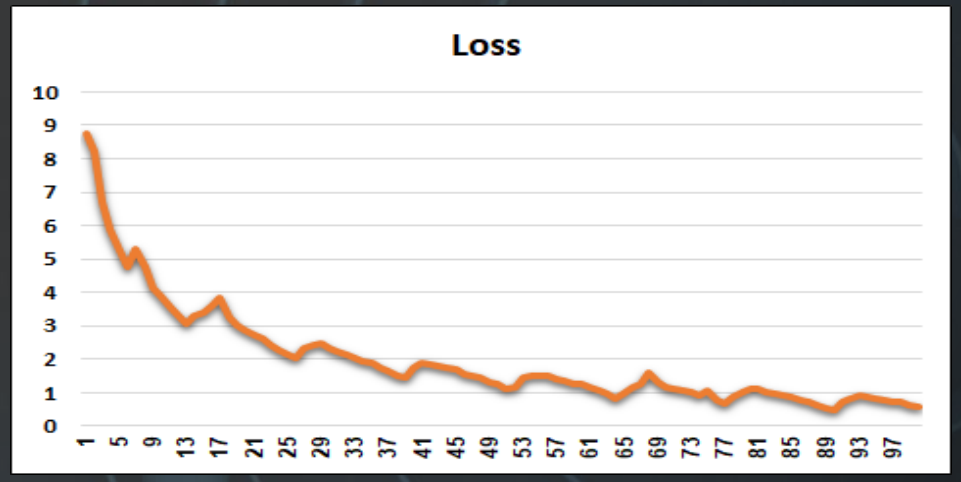
EVEN



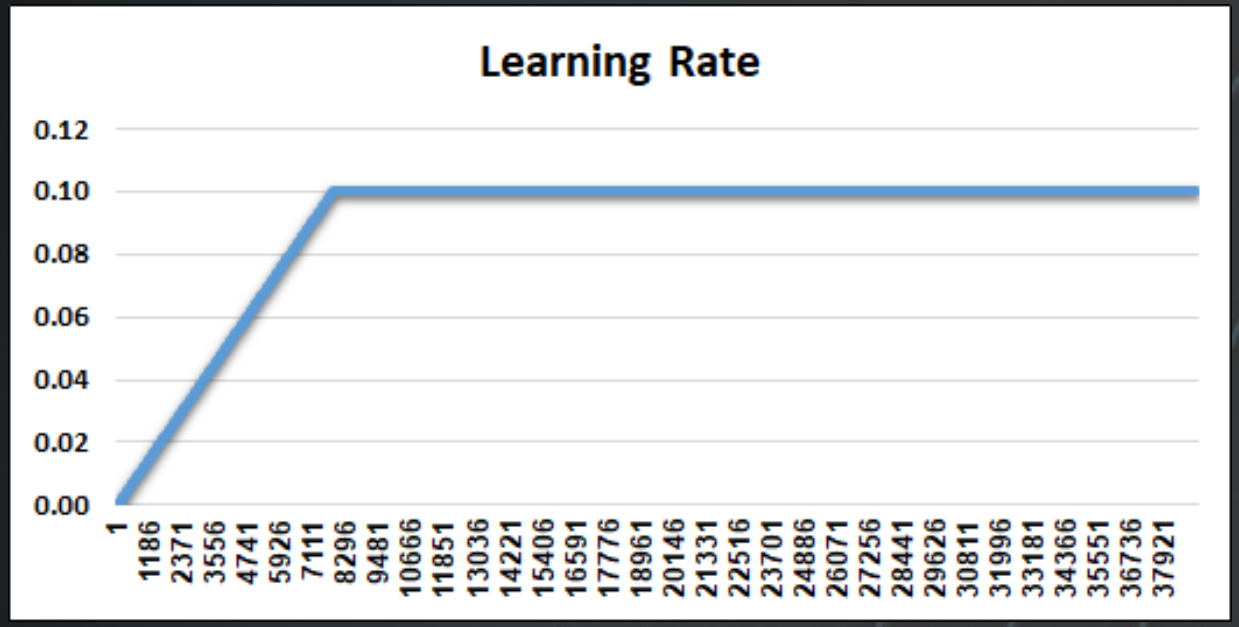


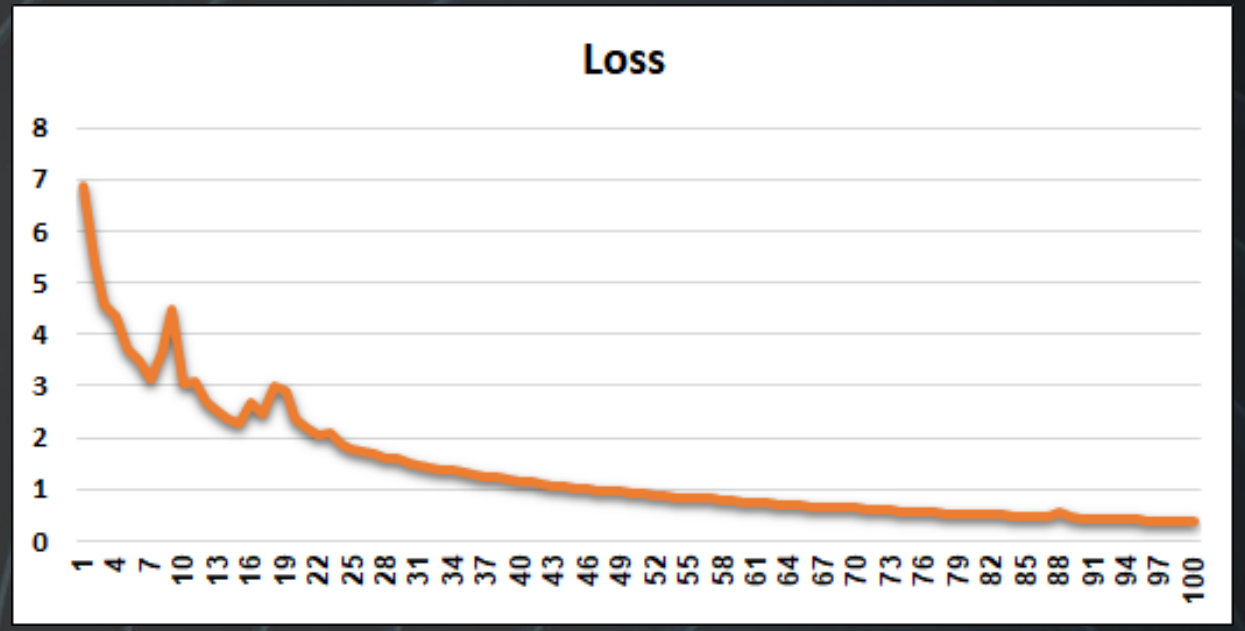
UNEVEN



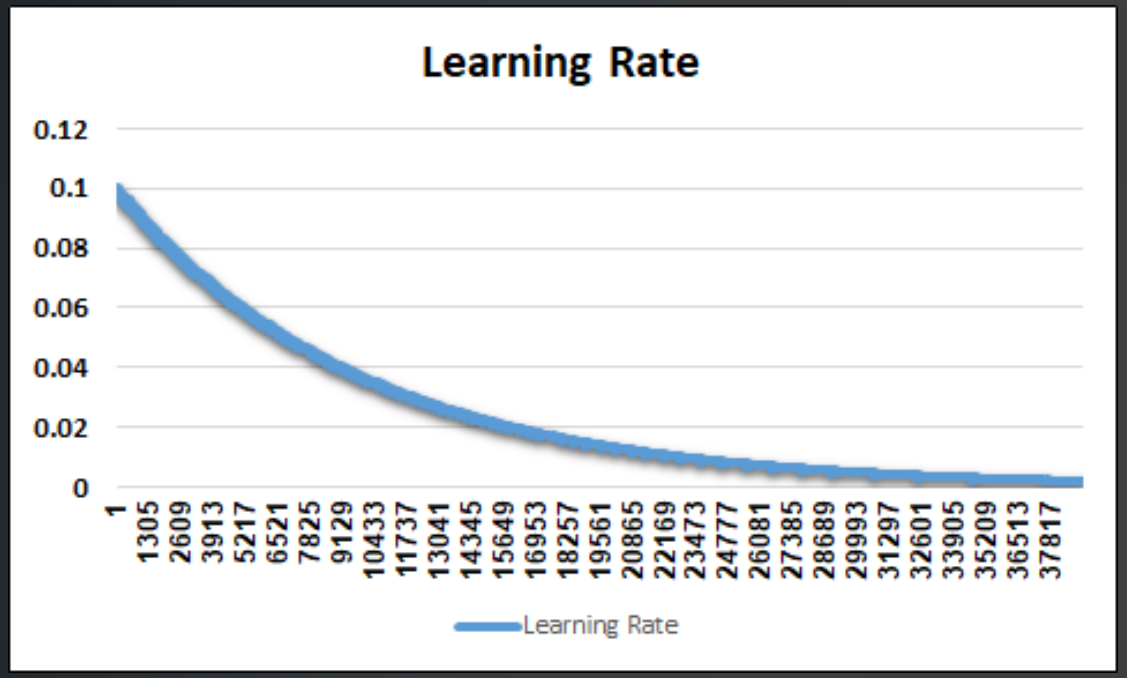


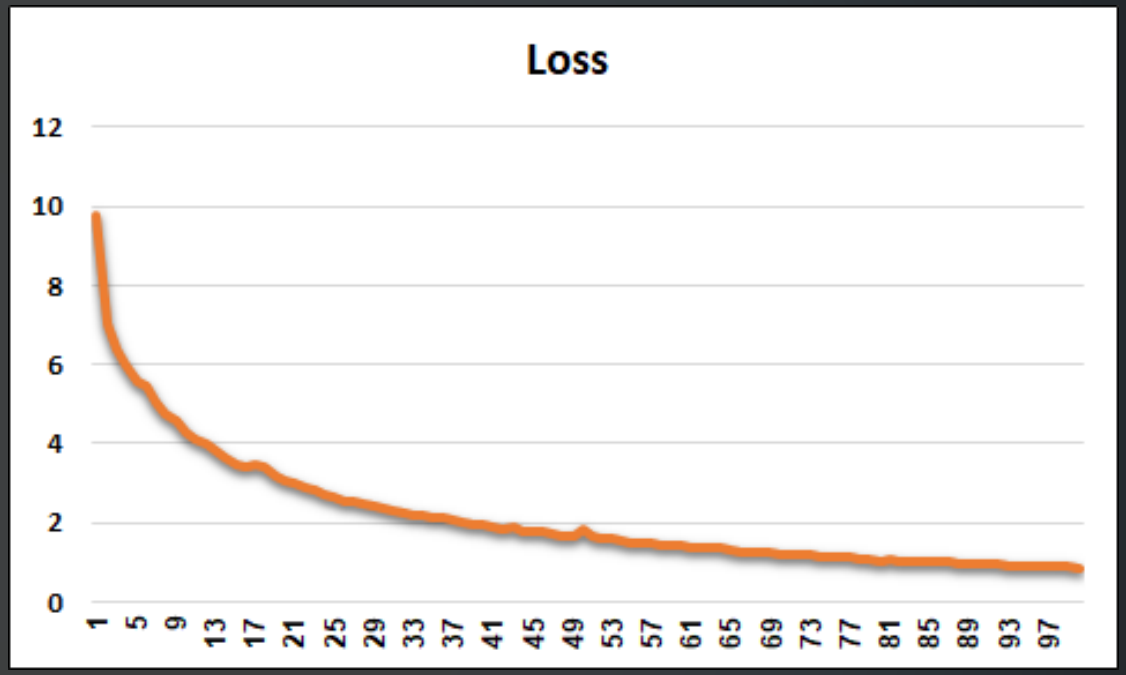
LEARNING RATE WARM-UP



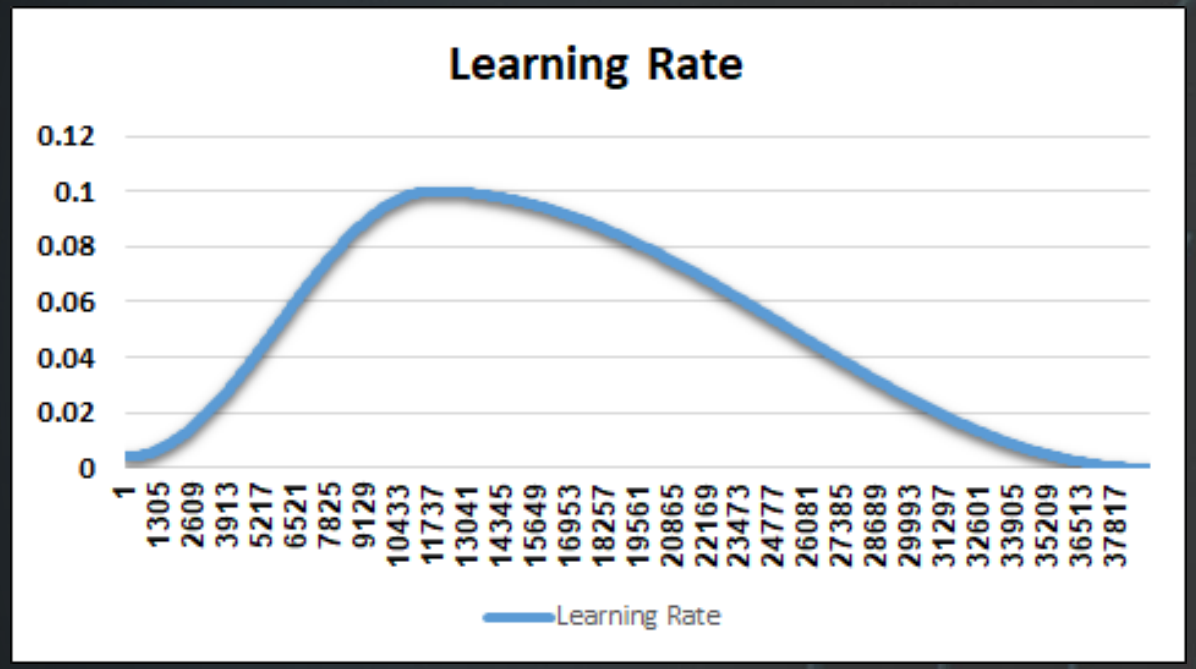


LEARNING RATE ANNEALING





ONE-CYCLE LEARNING RATE



CONCLUSIONS

model	accuracy	precision	recall	f1-score
Standard model	0.78	0.78	0.78	0.78
Cyclic	0.81	0.82	0.81	0.82
Warm-up	0.84	0.84	0.84	0.84
Annealing	0.78	0.78	0.78	0.78
One cycle	**0.85**	**0.85**	**0.85**	**0.85**
Uneven Cyclic	0.83	0.83	0.83	0.83

LRS improved our model!

Balanced learning with small initial LR

Poor results with large initial LR

Best results by One cycle