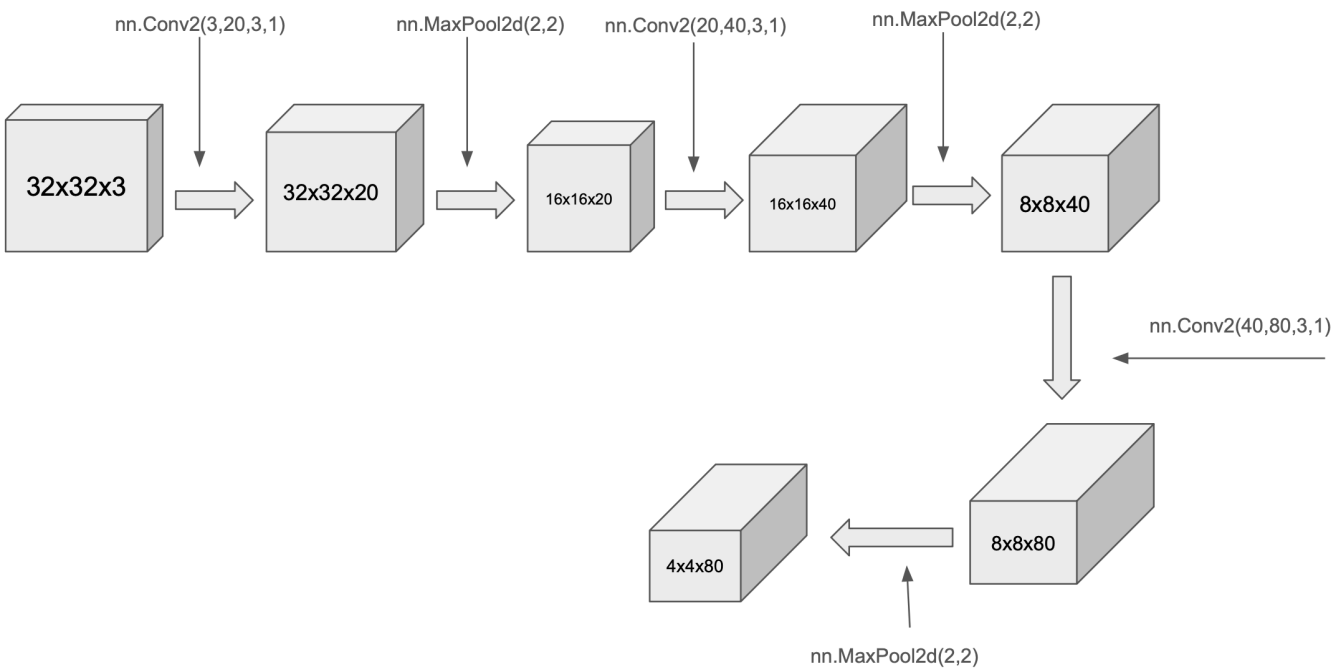
Report

Convolutional Layers



Total Parameters in Model

`Total Parameters` = $560 + 7240 + 28880 + 768600 + 6010 = 811290$

Convolutional Layer

1. `nn.Conv2d(3,20,3,1)` = $(3 * 3 * 3) * 20 + 20 = 560$
2. `nn.Conv2d(20,40,3,1)` = $(20 * 3 * 3) * 40 + 40 = 7240$
3. `nn.Conv2d(40,80,3,1)` = $(40 * 3 * 3) * 80 + 80 = 28880$

Fully Connected Layer

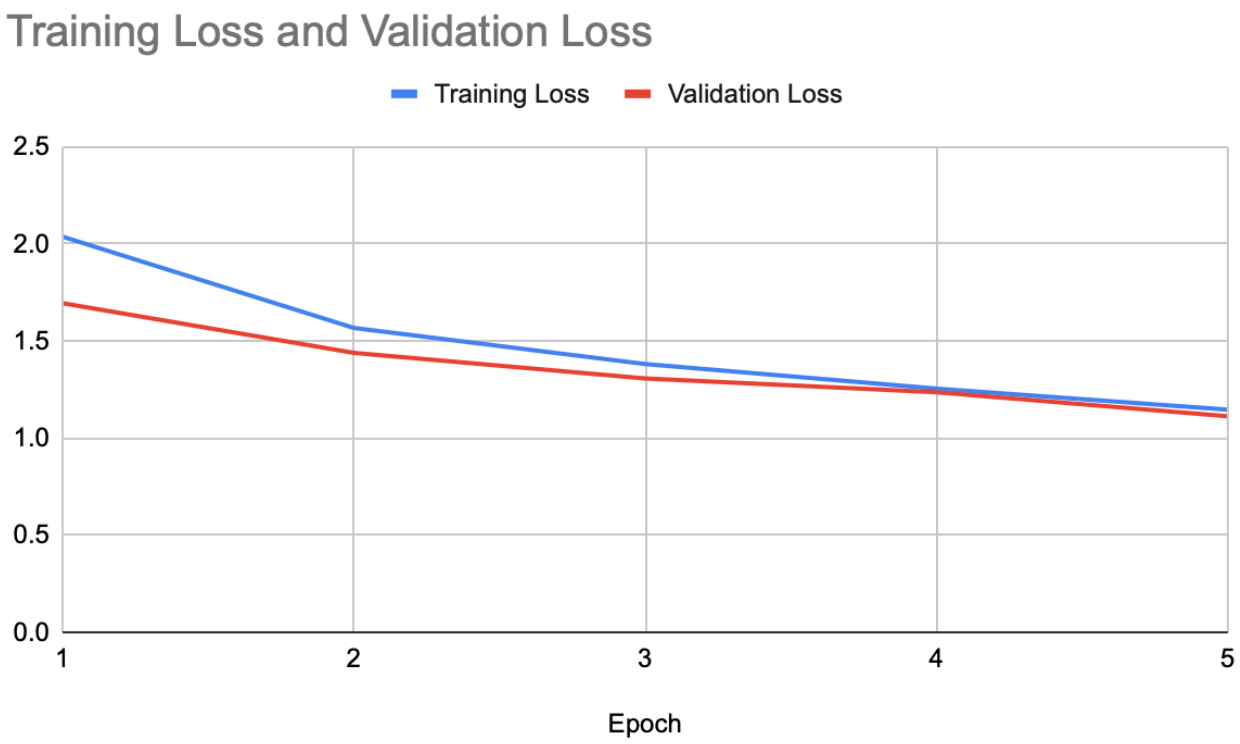
1. `nn.Linear(80*4*4,600)` = $1280 * 600 + 600 = 768600$
2. `nn.Linear(600,10)` = $600 * 10 + 10 = 6010$

Adam vs SGD Optimizer

- Using ADAM with a learning rate of `0.001` resulted in a significant increase in overall test accuracy (71% and 60%) compared to SGD with a learning rate of `0.01`.

Using SGD Optimizer (`learning_rate=0.01)

- Testing Time (on CPU): 1 minute, 56.9 seconds



Class	# Accuracy (%)	# Correct	# Total
Airplane	69	695	1000
Automobile	70	700	1000
Bird	33	334	1000
Cat	43	430	1000
Deer	57	572	1000
Dog	53	536	1000
Frog	62	627	1000
Horse	77	778	1000
Ship	82	828	1000
Truck	58	585	1000
Overall	**60**	6085	10000

Using Adam Optimizer (`learning_rate=0.001)

- Testing Time on CPU: 2 minutes, 8.4s

Class	Accuracy (%)	Correct	# Total
Airplane	76	763	1000
Automobile	79	791	1000
Bird	62	627	1000
Cat	52	523	1000
Deer	59	597	1000
Dog	61	614	1000
Frog	90	905	1000
Horse	70	705	1000
Ship	78	784	1000
Truck	83	837	1000
Overall	**71**	7146	10000