

## Results of LoRA Part Three

Average Loss = 0.32639601368883936

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BEFORE LoRA APPLICATION

Layer Name = sequential\_layers.layers.0.linear1.weight

Parameter Size = torch.Size([1000, 784])

Layer Name = sequential\_layers.layers.0.linear1.bias

Parameter Size = torch.Size([1000])

Layer Name = sequential\_layers.layers.0.linear2.weight

Parameter Size = torch.Size([2000, 1000])

Layer Name = sequential\_layers.layers.0.linear2.bias

Parameter Size = torch.Size([2000])

Layer Name = sequential\_layers.layers.0.linear3.weight

Parameter Size = torch.Size([784, 2000])

Layer Name = sequential\_layers.layers.0.linear3.bias

Parameter Size = torch.Size([784])

Layer Name = sequential\_layers.layers.1.linear1.weight

Parameter Size = torch.Size([1000, 784])

Layer Name = sequential\_layers.layers.1.linear1.bias

Parameter Size = torch.Size([1000])

Layer Name = sequential\_layers.layers.1.linear2.weight

Parameter Size = torch.Size([2000, 1000])

Layer Name = sequential\_layers.layers.1.linear2.bias

Parameter Size = torch.Size([2000])

Layer Name = sequential\_layers.layers.1.linear3.weight

Parameter Size = torch.Size([784, 2000])

Layer Name = sequential\_layers.layers.1.linear3.bias

Parameter Size = torch.Size([784])

Layer Name = mlp\_head.weight

Parameter Size = torch.Size([10, 784])

Layer Name = mlp\_head.bias

Parameter Size = torch.Size([10])

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Total Number of Parameters = 8719418

Accuracy Before Application of LoRA

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accuracy=95.7

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Wrong Count for Digit 0 = 12

Wrong Count for Digit 1 = 6

Wrong Count for Digit 2 = 38

Wrong Count for Digit 3 = 116

Wrong Count for Digit 4 = 24

Wrong Count for Digit 5 = 38

Wrong Count for Digit 6 = 45

Wrong Count for Digit 7 = 48

Wrong Count for Digit 8 = 43

Wrong Count for Digit 9 = 60

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#### AFTER LoRA APPLICATION

Layer Name sequential\_layers.layers.0.linear1.bias  
Parameter Size torch.Size([1000])  
Layer Name sequential\_layers.layers.0.linear1.parametrizations.weight.original  
Parameter Size torch.Size([1000, 784])  
Layer Name sequential\_layers.layers.0.linear1.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 784])  
Layer Name sequential\_layers.layers.0.linear1.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([1000, 1])  
Layer Name sequential\_layers.layers.0.linear2.bias  
Parameter Size torch.Size([2000])  
Layer Name sequential\_layers.layers.0.linear2.parametrizations.weight.original  
Parameter Size torch.Size([2000, 1000])  
Layer Name sequential\_layers.layers.0.linear2.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 1000])  
Layer Name sequential\_layers.layers.0.linear2.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([2000, 1])  
Layer Name sequential\_layers.layers.0.linear3.bias  
Parameter Size torch.Size([784])  
Layer Name sequential\_layers.layers.0.linear3.parametrizations.weight.original  
Parameter Size torch.Size([784, 2000])  
Layer Name sequential\_layers.layers.0.linear3.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 2000])  
Layer Name sequential\_layers.layers.0.linear3.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([784, 1])  
Layer Name sequential\_layers.layers.1.linear1.bias  
Parameter Size torch.Size([1000])  
Layer Name sequential\_layers.layers.1.linear1.parametrizations.weight.original  
Parameter Size torch.Size([1000, 784])  
Layer Name sequential\_layers.layers.1.linear1.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 784])  
Layer Name sequential\_layers.layers.1.linear1.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([1000, 1])  
Layer Name sequential\_layers.layers.1.linear2.bias  
Parameter Size torch.Size([2000])  
Layer Name sequential\_layers.layers.1.linear2.parametrizations.weight.original  
Parameter Size torch.Size([2000, 1000])  
Layer Name sequential\_layers.layers.1.linear2.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 1000])  
Layer Name sequential\_layers.layers.1.linear2.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([2000, 1])  
Layer Name sequential\_layers.layers.1.linear3.bias  
Parameter Size torch.Size([784])  
Layer Name sequential\_layers.layers.1.linear3.parametrizations.weight.original  
Parameter Size torch.Size([784, 2000])  
Layer Name sequential\_layers.layers.1.linear3.parametrizations.weight.0.lora\_A  
Parameter Size torch.Size([1, 2000])  
Layer Name sequential\_layers.layers.1.linear3.parametrizations.weight.0.lora\_B  
Parameter Size torch.Size([784, 1])  
Layer Name mlp\_head.weight  
Parameter Size torch.Size([10, 784])

Layer Name mlp\_head.bias

Parameter Size torch.Size([10])

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#### PARAMETERS WHERE LoRA NOT IN NAME

Layer Name = sequential\_layers.layers.0.linear1.bias

Layer Shape = torch.Size([1000])

Layer Name = sequential\_layers.layers.0.linear1.parametrizations.weight.original

Layer Shape = torch.Size([1000, 784])

Layer Name = sequential\_layers.layers.0.linear2.bias

Layer Shape = torch.Size([2000])

Layer Name = sequential\_layers.layers.0.linear2.parametrizations.weight.original

Layer Shape = torch.Size([2000, 1000])

Layer Name = sequential\_layers.layers.0.linear3.bias

Layer Shape = torch.Size([784])

Layer Name = sequential\_layers.layers.0.linear3.parametrizations.weight.original

Layer Shape = torch.Size([784, 2000])

Layer Name = sequential\_layers.layers.1.linear1.bias

Layer Shape = torch.Size([1000])

Layer Name = sequential\_layers.layers.1.linear1.parametrizations.weight.original

Layer Shape = torch.Size([1000, 784])

Layer Name = sequential\_layers.layers.1.linear2.bias

Layer Shape = torch.Size([2000])

Layer Name = sequential\_layers.layers.1.linear2.parametrizations.weight.original

Layer Shape = torch.Size([2000, 1000])

Layer Name = sequential\_layers.layers.1.linear3.bias

Layer Shape = torch.Size([784])

Layer Name = sequential\_layers.layers.1.linear3.parametrizations.weight.original

Layer Shape = torch.Size([784, 2000])

Layer Name = mlp\_head.weight

Layer Shape = torch.Size([10, 784])

Layer Name = mlp\_head.bias

Layer Shape = torch.Size([10])

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#### PARAMETERS WHERE LoRA IN NAME

Layer Name = sequential\_layers.layers.0.linear1.parametrizations.weight.0.lora\_A

Layer Shape = torch.Size([1, 784])

Layer Name = sequential\_layers.layers.0.linear1.parametrizations.weight.0.lora\_B

Layer Shape = torch.Size([1000, 1])

Layer Name = sequential\_layers.layers.0.linear2.parametrizations.weight.0.lora\_A

Layer Shape = torch.Size([1, 1000])

Layer Name = sequential\_layers.layers.0.linear2.parametrizations.weight.0.lora\_B

Layer Shape = torch.Size([2000, 1])

Layer Name = sequential\_layers.layers.0.linear3.parametrizations.weight.0.lora\_A

Layer Shape = torch.Size([1, 2000])

Layer Name = sequential\_layers.layers.0.linear3.parametrizations.weight.0.lora\_B

Layer Shape = torch.Size([784, 1])

Layer Name = sequential\_layers.layers.1.linear1.parametrizations.weight.0.lora\_A

Layer Shape = torch.Size([1, 784])

Layer Name = sequential\_layers.layers.1.linear1.parametrizations.weight.0.lora\_B

Layer Shape = torch.Size([1000, 1])

Layer Name = sequential\_layers.layers.1.linear2.parametrizations.weight.0.lora\_A

Layer Shape = torch.Size([1, 1000])

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Layer Name = sequential_layers.layers.1.linear2.parametrizations.weight.0.lora_B
Layer Shape = torch.Size([2000, 1])
Layer Name = sequential_layers.layers.1.linear3.parametrizations.weight.0.lora_A
Layer Shape = torch.Size([1, 2000])
Layer Name = sequential_layers.layers.1.linear3.parametrizations.weight.0.lora_B
Layer Shape = torch.Size([784, 1])
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#### INCREMENT OF PARAMETERS AFTER APPLICATION OF LoRA

Non LoRA Parameters = 8719418

LoRA Parameters = 15136

% Parameters Increment Due to LoRA 0.1735895675605872

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accuracy=61.529999999999994

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Wrong Count for Digit 0 = 117

Wrong Count for Digit 1 = 340

Wrong Count for Digit 2 = 711

Wrong Count for Digit 3 = 12

Wrong Count for Digit 4 = 85

Wrong Count for Digit 5 = 353

Wrong Count for Digit 6 = 167

Wrong Count for Digit 7 = 606

Wrong Count for Digit 8 = 959

Wrong Count for Digit 9 = 497