A Basic CNN:

For this part of the assignment, I had a convolutional 2D layer, followed by a ReLU layer, and then applied max pooling. The model would condense down to the number of classes in the data set, which was 10. The training loss was 0.0301, the validation loss was 2.6986, and the final test accuracy was 60.18%.

All Convolutional Net:

For this part of the assignment, I had a convolutional 2D layer, followed by a ReLU layer, and repeated that 2 more times. At the end, I applied a global average pooling to follow the All Convolutional Network architecture. The total number of parameters in the Basic CNN were around 26.5 million parameters, while this model had about 69.7 thousand parameters. This is because the Basic CNN has fully connected layers, while this model doesn't. The training loss was 0.8987, the validation loss was 0.9414, and the final test accuracy was 69.76%.

Regularization:

For this part of the assignment, I used the Basic CNN architecture from the first part. In the model, I applied ColorJitter() with a range up to 0.5 brightness and a hue with a range to 0.3 to the data set. After that, I applied a RandomRotation() with a range from 0° to 180°. These two were both forms of data augmentation, in which different results were achieved for the Basic CNN and this Regularized model. In this model, the training loss was 0.8263, the validation loss was 1.5633, and the final test accuracy was 51.21%. The final test accuracy was lower in this model compared to the Basic CNN because the data augmentation used in this model generalizes the data to prevent overfitting. Because of this, the model used in this part has a lower validation loss because of the more generalized data.

Transfer Learning:

For this part of the assignment, I chose to use the Regularization model that was used in the previous part and saved the model and loaded it into this model since it was pretrained on the Imagenette dataset. The training loss was 0.3801, the validation loss was 2.274, and the final

test accuracy was 59.47%. There is a slight increase in accuracy due to the use of transfer learning of a pretrained model on Imagenette.

Transfer Learning:
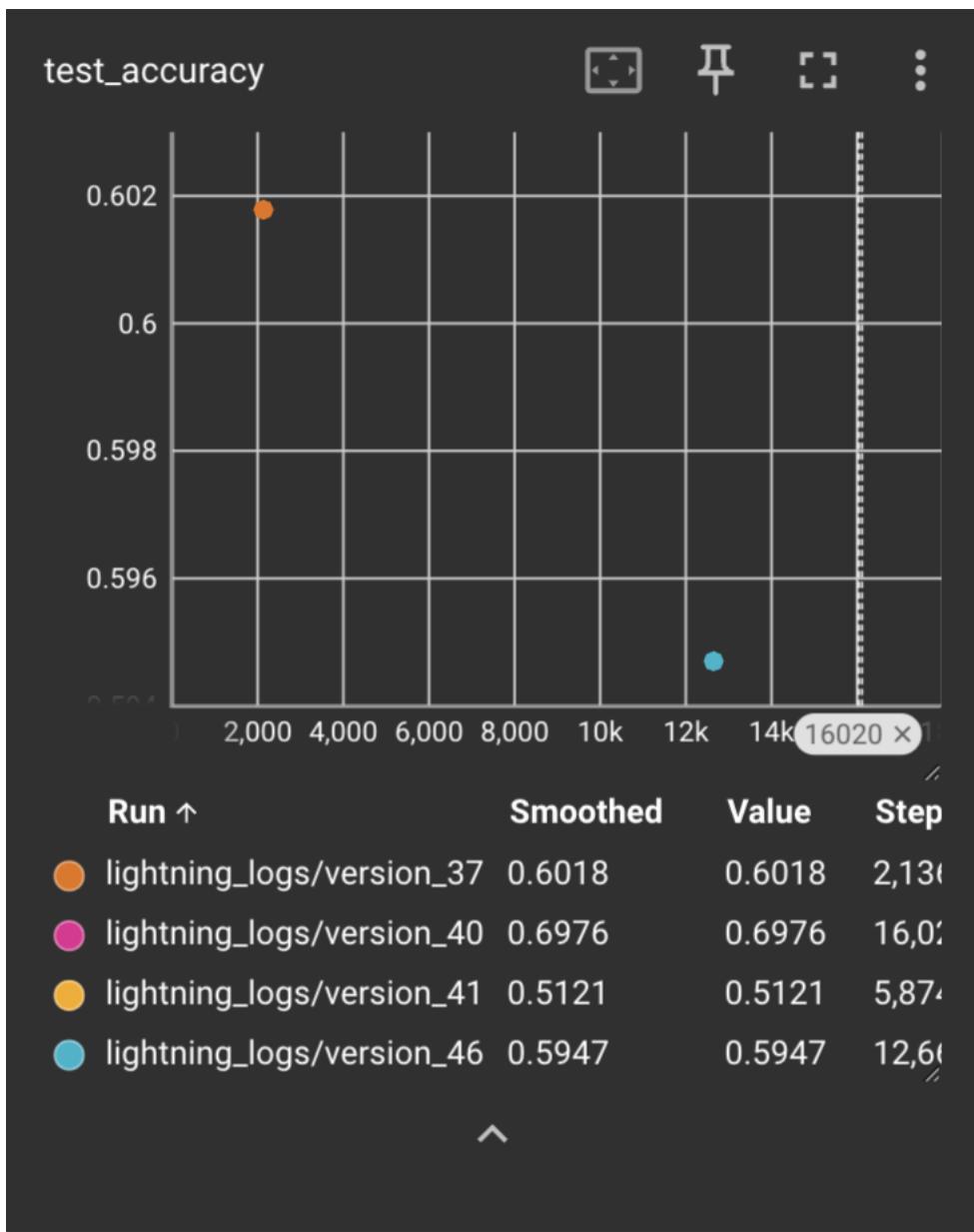
These are all of the graph from each part of the assignment.
Version 37 is the Basic CNN
Version 40 is the All Convolutional Net
Version 41 is the Regularization model
Version 46 is the Transfer Learning model
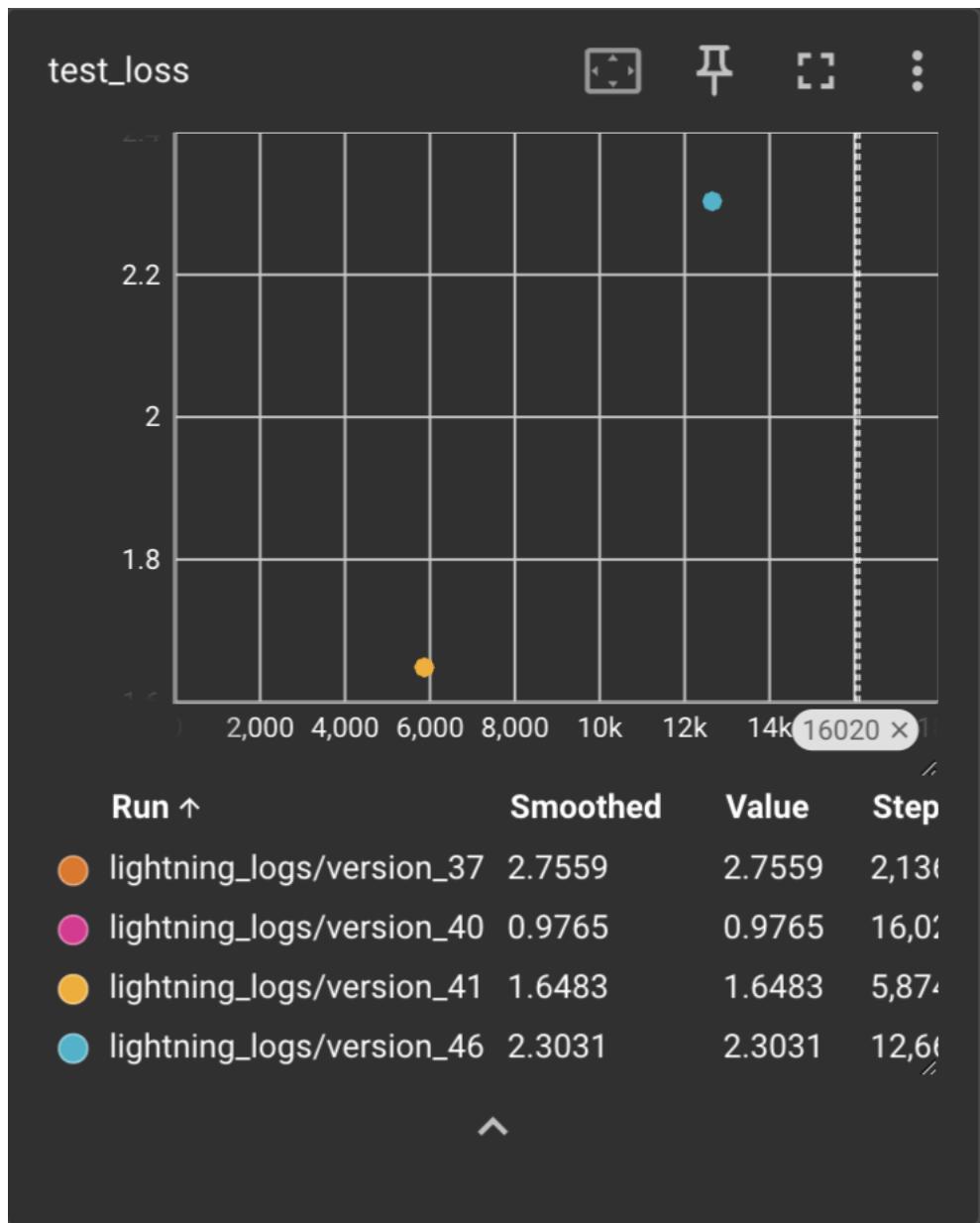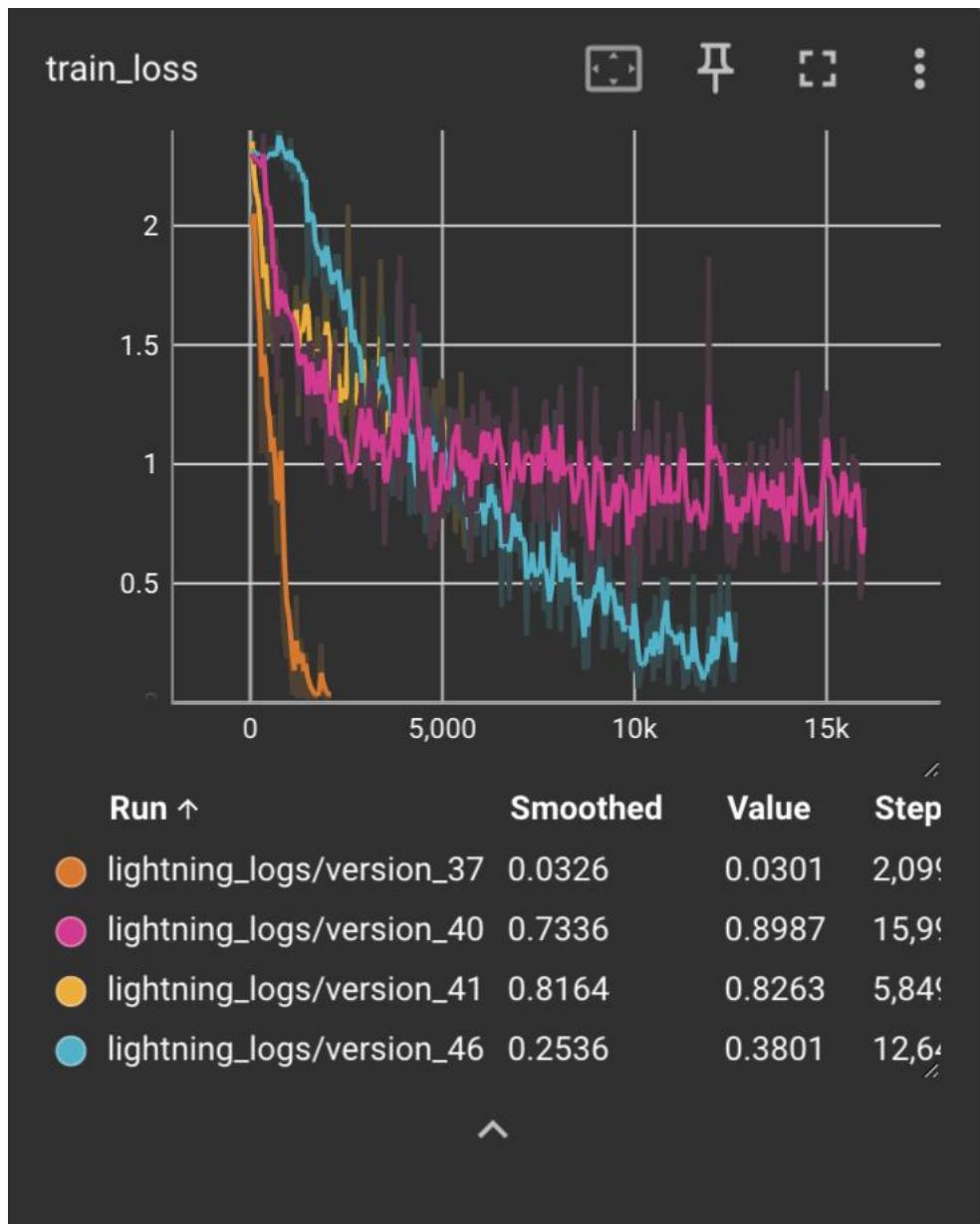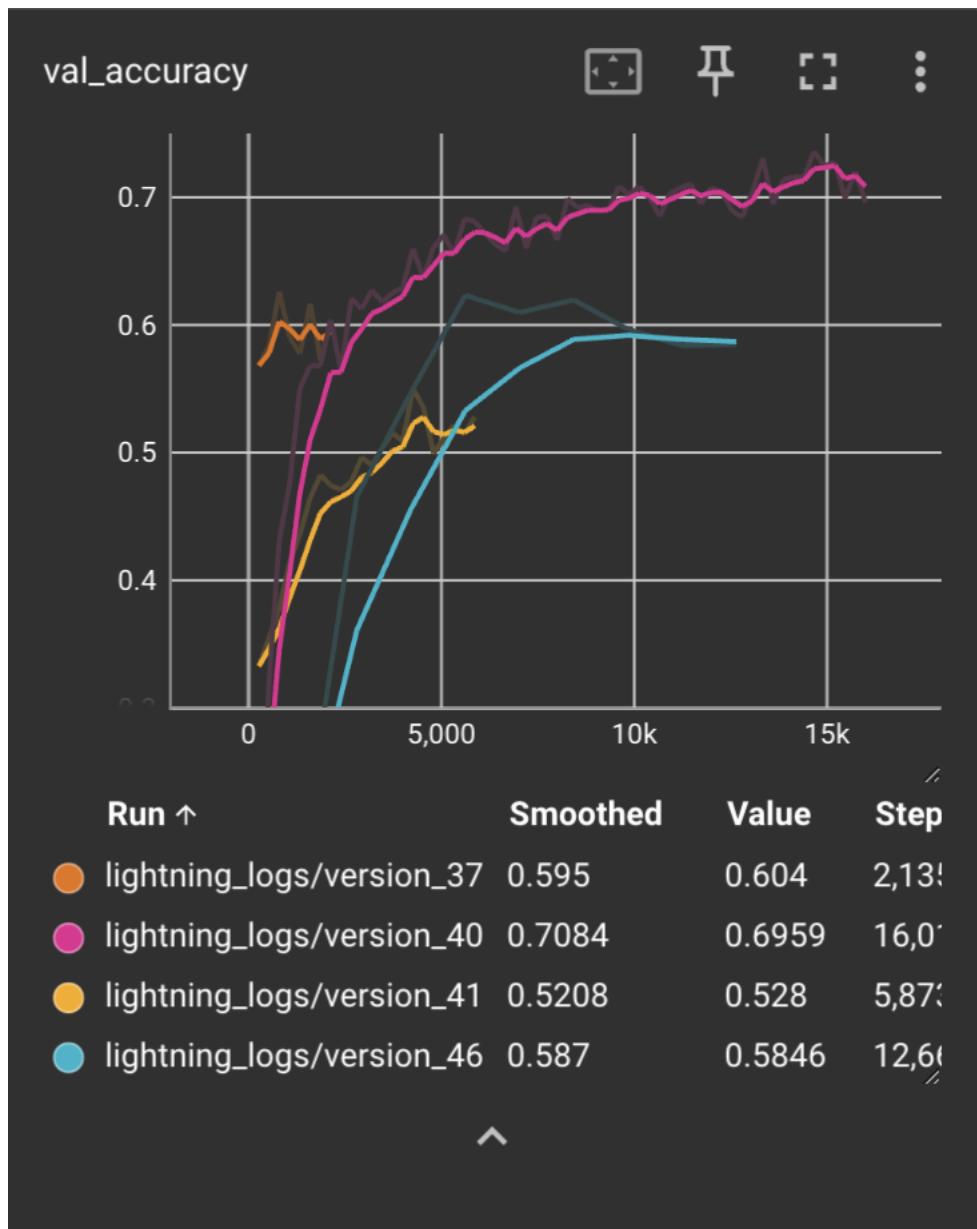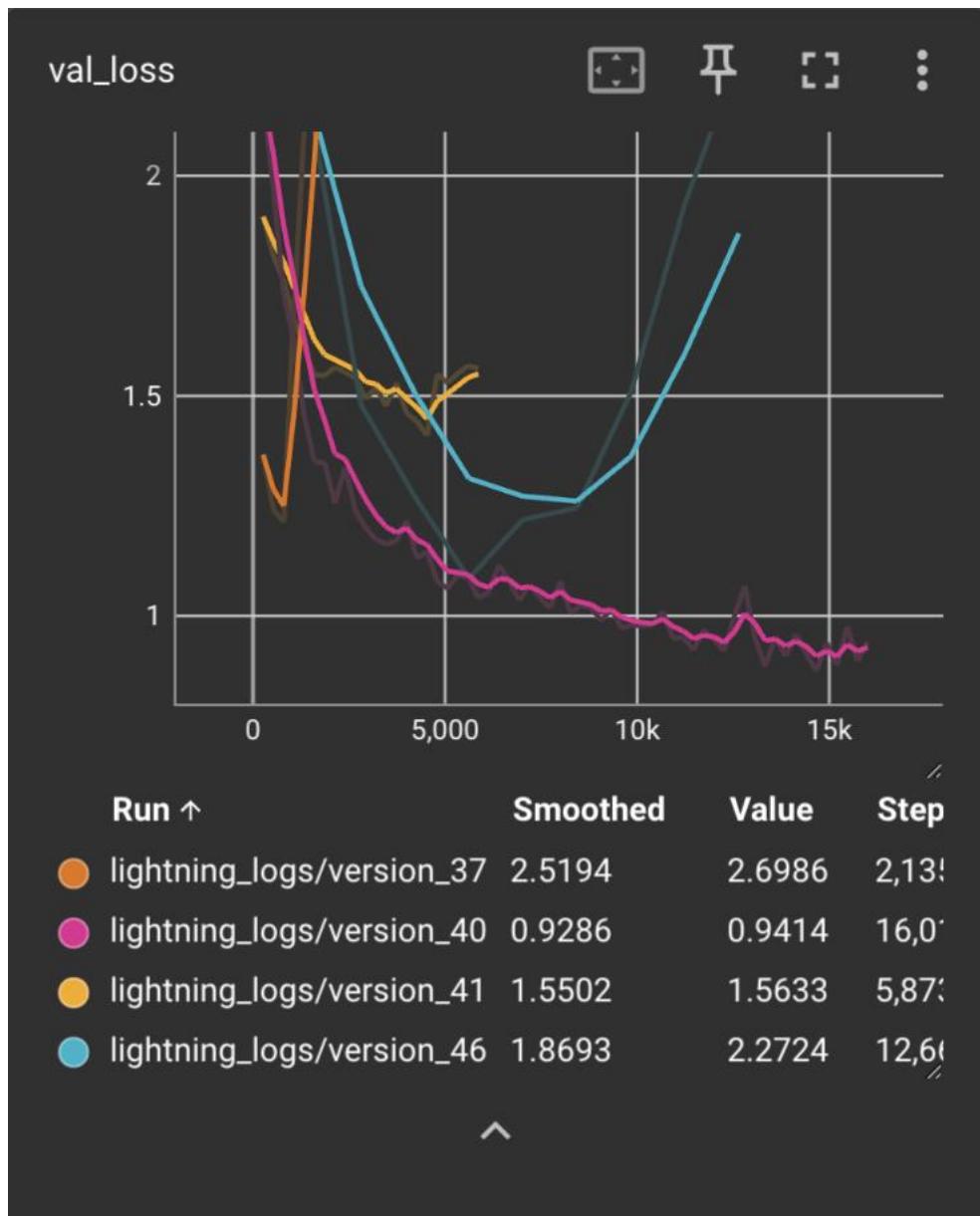
Run ↑	Smoothed	Value	Step
● lightning_logs/version_37	0.6018	0.6018	2,130
● lightning_logs/version_40	0.6976	0.6976	16,0:
● lightning_logs/version_41	0.5121	0.5121	5,874
● lightning_logs/version_46	0.5947	0.5947	12,60

test_loss

Run ↑	Smoothed	Value	Step
● lightning_logs/version_37	2.7559	2.7559	2,13€
● lightning_logs/version_40	0.9765	0.9765	16,0?
● lightning_logs/version_41	1.6483	1.6483	5,87₄
● lightning_logs/version_46	2.3031	2.3031	12,6€

train_loss

Run ↑	Smoothed	Value	Step
● lightning_logs/version_37	0.0326	0.0301	2,099
● lightning_logs/version_40	0.7336	0.8987	15,99
● lightning_logs/version_41	0.8164	0.8263	5,849
● lightning_logs/version_46	0.2536	0.3801	12,64

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val_accuracy

Run ↑	Smoothed	Value	Step
● lightning_logs/version_37	0.595	0.604	2,13!
● lightning_logs/version_40	0.7084	0.6959	16,0'
● lightning_logs/version_41	0.5208	0.528	5,87:
● lightning_logs/version_46	0.587	0.5846	12,6(

Run ↑	Smoothed	Value	Step
● lightning_logs/version_37	2.5194	2.6986	2,13!
● lightning_logs/version_40	0.9286	0.9414	16,0
● lightning_logs/version_41	1.5502	1.5633	5,87:
● lightning_logs/version_46	1.8693	2.2724	12,6(

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Best Weights:

OrderedDict({'model.features.0.weight': tensor([[[[-0.2830, -0.0951, -0.3504, 0.1342, 0.2217],

[-0.0959, 0.2522, -0.0761, -0.2164, -0.1329],

[-0.1384, -0.0028, -0.3105, -0.1842, -0.1572],

[-0.0343, -0.0007, -0.1617, -0.0057, -0.1801],

[-0.1125, -0.0924, -0.2078, -0.0960, -0.0597]],

[[-0.0532, 0.0244, -0.1721, 0.0970, 0.2428],

[-0.0712, -0.0751, -0.1992, -0.1639, -0.1492],

[-0.1027, 0.0453, -0.0122, -0.0394, -0.0818],

[0.1316, 0.0520, 0.0982, 0.1223, 0.0169],

[0.0807, -0.0445, 0.0139, 0.0714, 0.0641]],

[[0.0207, -0.0757, -0.0151, -0.0513, 0.2726],

[-0.1348, -0.2166, -0.2060, -0.0489, -0.0635],

[-0.0631, -0.1009, 0.0657, -0.0892, -0.1186],

[0.0278, 0.0398, -0.0035, 0.0851, 0.1413],

[0.0014, 0.0513, 0.1099, 0.0414, 0.1287]]],

[[[0.0750, -0.1253, -0.0492, -0.0494, -0.1401],

[-0.1642, -0.1282, 0.0174, 0.1390, -0.1589],

[-0.0134, 0.0963, -0.0451, -0.1150, -0.1442],

[-0.0485, -0.0210, -0.0601, -0.1412, -0.1238],

[0.1319, -0.0108, 0.1229, 0.0405, 0.0976]],

```
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 [-0.0480,  0.1337,  0.1268,  0.0942,  0.0048],
 [ 0.1417,  0.1065, -0.0805,  0.0325, -0.0289],
 [ 0.0324,  0.1557, -0.0097,  0.1507,  0.0229]],


[[ 0.0923, -0.0778, -0.1028,  0.0774, -0.0492],
 [-0.1594, -0.1681, -0.0420, -0.1263, -0.1300],
 [ 0.0446, -0.2138, -0.0927, -0.1391, -0.1083],
 [ 0.0054, -0.1578, -0.0609, -0.0611, -0.2061],
 [ 0.0175,  0.0571,  0.1471,  0.0141, -0.0407]]],



[[[-0.0820, -0.0856, -0.0447, -0.0704, -0.2838],
  [-0.0351, -0.0420,  0.0722, -0.0743, -0.2086],
  [-0.0951,  0.0008, -0.0976,  0.0992,  0.0644],
  [-0.1272, -0.0751, -0.0833,  0.1493,  0.1519],
  [ 0.0367,  0.1903,  0.2054,  0.0364, -0.0129]],


 [[ 0.0067,  0.0595,  0.0916, -0.2142, -0.1895],
  [-0.1034, -0.0910,  0.0587, -0.1210, -0.0974],
  [-0.1160, -0.0111,  0.0150,  0.0370, -0.0724],
  [-0.1099, -0.0927,  0.0439,  0.1306,  0.0501],
  [-0.0674,  0.0142, -0.0233,  0.1585, -0.0379]],


 [[ 0.0582,  0.1316,  0.0869, -0.0839, -0.0345],
```

```
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     [-0.1884, -0.0847, -0.0483,  0.1678,  0.1451],
     [-0.1445,  0.0157,  0.1638,  0.1633,  0.0015]]],


   ...,


   [[[-0.1127, -0.0931, -0.0217, -0.0720,  0.1517],
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     [-0.1121, -0.1116, -0.0328, -0.0127,  0.0626],
     [ 0.0576,  0.1702,  0.1521,  0.2448, -0.0364],
     [ 0.0210,  0.0353, -0.0720, -0.0902, -0.0486]],


    [[ 0.0035, -0.2752, -0.1685, -0.1689,  0.0420],
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     [-0.1479,  0.1322, -0.0591,  0.2291,  0.1208],
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     [-0.0282,  0.1614, -0.0080, -0.0175,  0.0191]]],
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  [ 0.0209, -0.2291, -0.1473,  0.0551,  0.0365],
  [ 0.0787, -0.0568, -0.0562,  0.0122,  0.0161],
  [-0.1545, -0.2996, -0.2692,  0.0080, -0.0746]],


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  [-0.0032, -0.0144,  0.1502, -0.0555,  0.0979],
  [ 0.0983, -0.0312, -0.1067,  0.0769, -0.0592],
  [-0.0051, -0.1578, -0.2264, -0.0763,  0.0616]],


 [[ 0.1146, -0.1701,  0.1091,  0.1338,  0.1556],
  [-0.0794, -0.0067,  0.1459,  0.2649,  0.0791],
  [ 0.0029, -0.0503, -0.0844,  0.0080,  0.1417],
  [ 0.1311,  0.0600,  0.0078, -0.0225,  0.0634],
  [ 0.0423, -0.0179, -0.1527, -0.0912,  0.0304]]],



[[[-0.0508,  0.1368,  0.0005,  0.0450,  0.0584],
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  [-0.0563,  0.1001,  0.2407,  0.0489, -0.0144],
  [ 0.1325, -0.0467,  0.1396, -0.1247, -0.0338],
  [ 0.0484,  0.1299, -0.0033, -0.0919, -0.2966]],
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         [-0.2138, -0.0178, 0.0282, 0.0732, -0.1057],

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         [-0.0557, 0.0514, 0.0532, -0.2058, -0.3057]],

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         [-0.1351, 0.0820, 0.1270, -0.0183, -0.1830],

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         0.0019, -0.2479, 0.1870, -0.2925, -0.1454, -0.1734, -0.2539, 0.1645,

        -0.2954, -0.4174, -0.2767, -0.1848, -0.2592, 0.2922, -0.2247, -0.2753]),
'model.features.3.weight': tensor([[[[-5.2652e-02, -6.5307e-02, -4.6563e-02, -5.7761e-02, -4.8926e-02],

         [-5.6624e-02, -8.8874e-02, 2.3745e-02, 4.5488e-02, -8.9250e-02],

         [-4.5606e-02, -5.1066e-02, -6.0822e-02, -9.2270e-02, -3.3611e-02],

         [-4.4467e-02, -1.0769e-01, -7.7380e-02, -6.3421e-02, -6.5057e-02],

         [-8.6072e-02, -8.5166e-02, -1.1025e-01, -5.5200e-02, -2.9379e-02]],

        [[-5.6104e-02, -7.6714e-02, -9.9021e-02, -1.1073e-01, -1.0748e-01],

         [-5.8059e-02, -6.3750e-02, -3.0108e-02, -5.0257e-02, -5.1509e-02],

         [-2.4401e-02, -5.9713e-04, 1.7775e-03, -2.1020e-03, 1.0141e-02],

         [-2.0170e-02, 2.4075e-03, 6.4679e-04, -6.1758e-02, -4.3657e-02],

[-5.1933e-02, -6.4022e-02, -4.0598e-02, -5.0080e-02, -5.8998e-02]],

      [[-1.3359e-02, -1.0657e-01, -6.7071e-02, -1.6974e-02, -4.3402e-02],
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       [-4.9757e-02, -9.0594e-02, -5.4066e-02, -5.4821e-02, -6.2423e-02],
       [-4.2077e-02, -6.5441e-02, -4.4011e-02, -9.7005e-03, -3.7837e-02],
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       [-4.9951e-02, -5.3775e-02, -9.8040e-02, -3.2406e-02, -8.7756e-02],
       [-2.7173e-02, -3.2925e-02, -9.6018e-02, -7.3176e-02, -9.0127e-02],
       [-7.7099e-02, -6.2802e-02, -7.1476e-02, -8.0342e-02, -6.4053e-02]],

      [[-7.1048e-02, -1.4879e-01, -7.5355e-02, -6.8678e-02, -3.0533e-02],
       [-4.7128e-02, -1.4238e-01, -4.3500e-02, -1.2053e-01, -5.6798e-02],
       [-6.6172e-02, -7.8219e-02, -5.3109e-02, -3.2897e-02, -6.1013e-02],
       [-1.0299e-01, -1.2965e-01, -5.9537e-03, -6.0407e-02, -7.7850e-02],
       [-9.1174e-02, -1.5735e-01, -2.9513e-02, -9.6329e-02, -3.4463e-02]],

      [[-4.8571e-02, -1.3221e-02, -5.0751e-02, -6.8485e-02, -8.0841e-02],
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       [-1.0624e-01, -6.0223e-02, 5.0482e-02, -1.0950e-01, -6.5363e-02],
       [-1.3132e-01, -6.3470e-02, -9.6048e-03, -8.3741e-02, -4.8791e-02],

[-1.2079e-01, -7.9748e-02, -5.3100e-03, -1.7266e-01, -3.1660e-02]]],

[[[-1.8055e-02, 3.1042e-02, 7.0481e-02, 8.7744e-02, 9.6111e-02],
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  [-6.0541e-02, -3.6249e-03, -1.7819e-02, 2.6077e-02, 3.7996e-02],
  [-5.0433e-02, -1.1757e-03, -1.4299e-03, 2.9391e-02, 2.1831e-02],
  [-7.1750e-02, -7.5406e-02, -9.1507e-02, -2.0748e-02, -7.0407e-02]],

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  [-7.9872e-03, 3.4022e-02, 4.3609e-02, 7.5563e-02, 4.1141e-02],
  [-5.0508e-02, -3.7331e-03, 5.9896e-03, 5.3932e-02, 5.2234e-02],
  [3.8461e-04, 4.2109e-04, 2.4199e-02, 4.9997e-02, 3.6117e-02],
  [3.1830e-02, 5.0823e-02, 9.2037e-03, 3.4063e-02, 4.5799e-02]],

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  [-7.7120e-02, -6.8492e-03, -1.0711e-02, 2.0963e-02, 4.2516e-02],

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     [[ 7.0378e-02,  3.1955e-02,  1.2316e-01,  2.4217e-01,  3.5794e-01],
      [-6.5953e-02, -6.7404e-02, -5.6903e-02,  1.1841e-01,  2.5617e-01],
      [-1.0895e-01, -1.6905e-01, -1.9114e-01, -8.6451e-02,  3.6684e-02],
      [-4.6965e-02, -1.8338e-01, -1.5625e-01, -1.6160e-01, -4.2618e-02],
      [-6.2926e-02, -1.0632e-01, -1.6762e-01, -1.4893e-01, -7.9948e-02]],


     [[-2.0487e-03,  3.8970e-02,  2.8292e-02,  4.7320e-02,  2.0071e-02],
      [ 2.3381e-02, -9.4015e-02, -7.5071e-02, -8.7127e-02,  3.2610e-02],
      [ 3.1650e-02, -1.3771e-01, -1.3261e-01, -1.1435e-01, -2.6193e-03],
      [ 3.1258e-02, -3.7144e-02, -1.1010e-01, -4.9974e-02,  9.5911e-02],
      [ 2.3575e-02, -1.1109e-01, -7.8379e-02, -6.7379e-02,  3.1303e-02]]],



    [[[ 1.0423e-02,  8.9765e-03, -1.7677e-02,  5.7159e-03, -2.9159e-02],
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      [-9.9397e-03, -3.3587e-02, -5.3566e-02, -6.2323e-03, -1.0151e-02],
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      [-1.9587e-02, -9.3390e-03,  7.5506e-03, -6.2227e-03, -2.3789e-02],
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   [[-1.3350e-01, -5.4288e-02, -1.7899e-01, -7.5826e-02, -1.1598e-02],
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        1.4899e-04, -6.2668e-02, -4.2444e-02, -9.0593e-02, -4.1170e-02,

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[-1.2380e-01, -4.8118e-02, -3.8618e-02, -8.1683e-02, -3.7306e-02],

[-4.4115e-02, -2.5680e-02, 3.0688e-02, -1.0474e-02, -8.2573e-03],

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[-1.2263e-01, -8.4096e-02, -4.0062e-02, -5.5810e-03, -1.2212e-01],

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    [4.7035e-03, -8.0626e-03, -2.5892e-02, 1.7354e-02, 6.6763e-03]],

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    [-3.6954e-02, -5.0568e-02, -4.5429e-02, 6.5567e-02, 5.2459e-02],

    [-6.3515e-02, -5.0379e-02, -3.8088e-02, 9.3371e-02, 9.8995e-02],

    [-1.9116e-01, -4.9771e-02, -5.2449e-02, -1.7412e-02, 1.0252e-02]],

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    [-9.4416e-04, -1.5952e-02, -1.0225e-03, -1.7386e-02, 6.9801e-04],

    [-4.8050e-03, -3.0268e-02, -2.9049e-03, -2.2101e-02, -2.6944e-02],

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     [-5.3750e-03, -1.5170e-02, -1.1707e-02,  6.4272e-03, -4.8348e-03],
     [-1.9934e-02, -8.2764e-04, -1.1254e-02, -4.9286e-03,  8.1683e-03]]],


   [[[-1.9396e-02,  3.8045e-03, -2.5282e-02, -1.9534e-02, -1.7911e-02],
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     [ 9.9974e-03, -1.0321e-02, -3.6630e-03,  1.5145e-02,  1.6617e-02]],


    [[-2.3724e-01, -1.9267e-01, -1.7040e-01, -1.6445e-01, -1.5101e-01],
     [-2.2793e-01, -1.4241e-01, -7.0717e-02, -3.0192e-02, -1.4020e-01],
     [-2.0881e-01, -1.6448e-01, -4.0796e-02, -1.1222e-01, -1.8308e-01],
     [-2.6106e-03,  9.6221e-03,  1.4039e-02,  1.9344e-02, -6.9133e-02],
     [ 1.2078e-02, -1.9906e-01,  1.1889e-02,  9.4326e-03, -5.6441e-03]],


    [[ 2.1725e-03,  3.6781e-03, -1.1503e-02, -1.3894e-02, -1.8314e-02],
     [ 5.1549e-03, -1.4525e-02, -3.1185e-02,  3.0642e-03, -2.9986e-02],
     [-7.5227e-03, -6.9876e-03, -2.5870e-02, -8.7178e-03,  1.1089e-02],
     [-2.9135e-02,  4.6337e-03,  1.8272e-03, -2.7686e-02, -1.1884e-02],
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    [[ 2.1910e-02,  1.8612e-02,  1.5464e-02,  1.3148e-02, -1.8770e-02],
     [-1.4609e-02, -2.6566e-02, -2.2639e-02,  9.5568e-03, -8.5324e-03],
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[[-4.0318e-01, -2.2983e-01, -6.9495e-02, -1.4669e-01, -9.0565e-02],
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 [-9.1542e-03, -2.2326e-02, -1.8739e-02,  8.0363e-03,  1.5548e-02]]],


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[[[-2.8278e-02,  1.1371e-02,  2.2396e-02,  4.7042e-02,  3.0082e-02],
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  [ 5.2574e-03,  7.5827e-03, -4.0917e-03, -3.5132e-03,  2.5979e-02],
  [-2.0252e-02, -1.3102e-02,  4.5460e-03, -2.1282e-02,  6.5809e-03],
  [ 4.0844e-02,  2.0091e-02,  2.8468e-02, -3.2500e-02, -1.9742e-03]],
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 [-6.7780e-02, -2.1776e-01, -1.3957e-01, -1.3174e-01, -2.0046e-01],
 [-6.1098e-02, -6.6578e-02, -1.5260e-01, -2.0615e-01, -1.3145e-01]],

[[-2.4543e-02, -3.7778e-02, -1.7344e-02, -2.3824e-02, 8.0100e-03],
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[[1.0404e-02, 3.0079e-04, -2.3902e-03, 1.3217e-02, 1.1579e-02],
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 [-2.4266e-02, 1.2038e-02, -3.8435e-03, 1.2622e-02, -1.8949e-02],
 [-5.9556e-03, -3.0434e-02, -2.7263e-02, -9.7067e-05, -2.7481e-02]],

[[-1.9271e-01, -1.2069e-01, -1.4893e-04, -1.9700e-02, -1.1981e-01],
 [-2.3960e-01, -2.1092e-01, -1.5632e-01, -1.3259e-01, -1.9927e-01],
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 [-1.7950e-01, -1.5023e-01, -2.1934e-01, -1.5366e-01, -1.0739e-01],
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 [-1.0145e-02, -9.2409e-03, -9.7501e-03, -1.1333e-02,  1.1422e-03],
 [-2.3667e-02, -2.6746e-02,  1.4635e-02, -1.1725e-02,  9.7602e-03],
 [ 1.7450e-02,  1.4204e-02, -4.3060e-03,  1.4266e-02, -1.8616e-02]]],


[[[ 5.0713e-03,  1.3840e-02,  9.1673e-03,  3.1035e-04, -6.4812e-03],
 [-1.2628e-02, -2.1117e-02,  1.4020e-02, -1.6871e-02, -2.8211e-02],
 [-3.1344e-02, -1.0005e-02, -1.3349e-02,  3.0419e-02,  5.7491e-03],
 [-1.2093e-02, -1.3919e-02,  9.2027e-03,  1.7854e-03,  2.5812e-02],
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[[-3.1578e-02, -8.2626e-03, -7.3584e-03, -9.7970e-02, -1.1388e-01],
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 [-1.9294e-01, -1.2254e-01, -1.5818e-01, -7.5964e-02, -6.2000e-02],
 [-1.1024e-01, -2.0916e-01, -1.1052e-01,  1.6294e-02, -7.3238e-02],
 [-7.6667e-02,  3.3093e-05, -8.9885e-02, -3.7989e-02, -6.6349e-02]],


[[-1.0098e-02, -2.6108e-02, -1.7476e-02,  1.7635e-02, -1.3906e-02],
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 [-7.5327e-03,  1.6449e-02,  9.7016e-03, -3.4220e-03,  1.6029e-02]],


[[-1.2016e-01, -9.9858e-02, -1.0239e-01, -2.2989e-01, -1.6352e-01],
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[[-3.3312e-03, -1.1208e-02, -5.5933e-03, -8.6862e-03, -2.0814e-03],
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 [-9.9233e-03, -2.6548e-02, -1.7269e-02, -2.2454e-02, -2.5909e-02],
 [-1.2752e-02, -1.8880e-02, -1.3743e-02, -2.9104e-02, -2.2061e-02]]],



[[[ 8.8392e-02,  4.8415e-02,  2.9451e-02,  1.8545e-02,  4.1599e-02],
 [ 5.4923e-02,  4.1609e-02,  7.4377e-03,  1.9803e-02,  3.7819e-02],
 [ 4.1466e-02,  5.2161e-02, -4.7735e-03,  4.6316e-02, -1.4014e-02],
 [ 1.1334e-01,  1.6996e-01,  1.0183e-01,  1.0244e-01,  6.1788e-02],
 [ 9.4399e-02,  1.3281e-01,  3.4331e-02,  4.3191e-02,  9.6802e-03]],
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[[ 9.4852e-02,  1.2289e-02,  1.1436e-02,  3.7873e-02,  2.5463e-02],
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 [ 1.5005e-02,  1.2242e-02,  4.1331e-03, -1.7509e-02,  7.7518e-03],
 [-3.0867e-03, -1.9736e-02,  1.0470e-02,  1.5323e-02,  2.6465e-03]],

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 [-1.5910e-01, -1.9345e-01, -1.5359e-01,  2.4143e-02,  2.6786e-02]],
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      [ 8.0479e-03, -1.1039e-02, -9.8046e-04,  1.3964e-02,  5.5225e-03],

      [-2.6333e-02, -1.8663e-02, -3.1711e-03,  6.6259e-03, -2.7591e-03],

      [ 3.3605e-03, -4.8090e-02,  1.8554e-02, -1.6791e-02,  3.9353e-03],

      [-2.1823e-02, -2.3219e-02, -5.2395e-03, -1.7885e-02,  2.3499e-02]]]]),
'model.features.6.bias': tensor([-0.3175,  0.0205, -0.1266, -0.1293, -0.2053,  0.1670, -0.1299,
0.0665,

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      -0.1732, -0.2194, -0.1065, -0.1898, -0.0676,  0.0562,  0.1483, -0.1632,

      -0.1043, -0.0788, -0.1601, -0.2983, -0.0596,  0.0858,  0.0401, -0.1476,

      -0.1318, -0.0032, -0.0076, -0.0480, -0.0075,  0.3136,  0.2889, -0.2493,

      -0.4564, -0.2214,  0.1170, -0.3219, -0.1982, -0.1398,  0.1217,  0.2374,

      -0.1090, -0.1063, -0.1129, -0.2946, -0.2976,  0.1596, -0.0869, -0.0133,

      -0.0299,  0.0951, -0.0045, -0.0278,  0.0043, -0.0518,  0.0843, -0.1219,

      -0.0172,  0.5003, -0.0549, -0.0101, -0.0309, -0.1514, -0.2052, -0.0152,

      -0.0259,  0.0521, -0.3275, -0.2325, -0.3618, -0.0104, -0.1313, -0.0699,

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      -0.0592, -0.0069,  0.1257,  0.2125,  0.0231, -0.5320, -0.0603, -0.0277,

      -0.1201, -0.1977,  0.1837, -0.0368, -0.0158, -0.2320, -0.1947, -0.0841,

      -0.1173, -0.0468, -0.0478, -0.1371, -0.1132, -0.1021, -0.0131,  0.0935]),
'model.estimator.0.weight': tensor([[ 0.0421,  0.0482,  0.0147,  ...,  0.0207,  0.1203,  0.0517],

      [ 0.1019,  0.0229,  0.0038,  ..., -0.1442, -0.1442, -0.0425],

      [ 0.1133, -0.0196, -0.0115,  ...,  0.0248,  0.0350,  0.0197],

      ...,

      [ 0.0072,  0.0025,  0.1066,  ..., -0.0490, -0.0152,  0.0971],
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[-0.0097, -0.0103, -0.0020, ..., -0.0092, -0.0030, -0.0082],

[-0.0077, -0.0098, -0.0085, ..., 0.0066, -0.0100, 0.0050]]), 'model.estimator.0.bias': tensor([-1.3996e-01, -5.4660e-03, -3.4671e-02, -1.3848e-01, -5.9708e-02,

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