

# 0810-sh\_em\_1qm\_v2

August 10, 2023

```
[ ]: initial_path = 'peptide-QML/'  
# initial_path = '../'  
  
[ ]: day = "0810"  
name_notebook = day + "-sh_em_1qm_v2.ipynb"  
  
#ask the user if that is correct, if he says yes kkeep going, otherwise stop  
import sys  
answer = input("{} is the name of the notebook | Is that correct? (y/n): ".  
↳format(name_notebook))  
if answer != "y":  
    print("Please, change the name of the notebook")  
    sys.exit()  
  
[ ]: import numpy as np  
  
[ ]: import sys  
sys.path.append(initial_path)  
  
%load_ext autoreload  
%autoreload 2  
from my_code import functions as f  
from my_code import pytorch_model as ptm  
from my_code import quantum_nodes as qn  
from my_code import pytorch_wrappers as pw
```

The autoreload extension is already loaded. To reload it, use:

```
%reload_ext autoreload
```

## 1 Data

```
[ ]: data_file_path = initial_path + 'data/Scores/PET/generated/  
↳bb14_Strings_Energies_10_000_4_aa.txt' # Replace with the actual path to  
↳your 'data.txt' file  
string_list, number_list = f.read_data_file(data_file_path)  
score_list = np.array(number_list)
```

```
vector_list = np.array([f.string_to_numbers(string) for string in string_list])  
    ↪ # one hot encoding
```

```
[ ]: X, Y, X_validation, Y_validation = f.create_validating_set(vector_list,  
    ↪ score_list, percentage=0.1)
```

```
[ ]: # Define the dataset  
input_data = ptm.torch.tensor(X)  
target_data = ptm.torch.tensor(Y).view(-1, 1)  
  
# Define the validation set  
input_validation = ptm.torch.tensor(X_validation)  
target_validation = ptm.torch.tensor(Y_validation).view(-1, 1)
```

```
[ ]: input_data.shape, target_data.shape, input_validation.shape, target_validation.  
    ↪ shape
```

```
[ ]: (torch.Size([9000, 4]),  
      torch.Size([9000, 1]),  
      torch.Size([1000, 4]),  
      torch.Size([1000, 1]))
```

## 2 Quantum node

```
[ ]: n_aminoacids = len(string_list[0])
```

```
[ ]: quantum_layer = qn.circuit(  
    n_qubits = n_aminoacids,  
    device = "default.qubit.torch",  
    device_options = {'shots': None},  
    embedding = qn.parts.AngleEmbedding,  
    embedding_ansatz = qn.parts.Ansatz_11,  
    block_ansatz = qn.parts.Ansatz_11,  
    measurement = qn.parts.Measurement('Z', 1),  
    embedding_n_layers = 4,  
    different_inputs_per_layer = True,  
    block_n_layers = 50,  
    # wrapper_qlayer = pw.QLayer,  
    wrapper_qlayer = None,  
)
```

```
[ ]: quantum_layer.weights_shape, quantum_layer.input_shape
```

```
[ ]: ({'embedding_weights': (48,), 'block_weights': (600,)}, (20,))
```

```
[ ]: quantum_layer.draw(size=(50,3))
```

```

/usr/lib/python3.8/_collections_abc.py:832: MatplotlibDeprecationWarning:
The examples.directory rcparam was deprecated in Matplotlib 3.0 and will be
removed in 3.2. In the future, examples will be found relative to the 'datapath'
directory.
    self[key] = other[key]
/usr/lib/python3.8/_collections_abc.py:832: MatplotlibDeprecationWarning:
The savefig.frameon rcparam was deprecated in Matplotlib 3.1 and will be removed
in 3.3.
    self[key] = other[key]
/usr/lib/python3.8/_collections_abc.py:832: MatplotlibDeprecationWarning:
The text.latex.unicode rcparam was deprecated in Matplotlib 3.0 and will be
removed in 3.2.
    self[key] = other[key]
/usr/lib/python3.8/_collections_abc.py:832: MatplotlibDeprecationWarning:
The verbose.fileo rcparam was deprecated in Matplotlib 3.1 and will be removed
in 3.3.
    self[key] = other[key]
/usr/lib/python3.8/_collections_abc.py:832: MatplotlibDeprecationWarning:
The verbose.level rcparam was deprecated in Matplotlib 3.1 and will be removed
in 3.3.
    self[key] = other[key]

```

[illegible]

### 3 Hybrid model

```
[ ]: input_dim = input_data.size(1)

n_pre_classical_layers = 4
layers_dim = np.linspace(n_aminoacids, input_dim, 4).astype(int)
```

```
[ ]: import torch.nn as nn
import torch
class ClippedReLU(nn.Module):
    def __init__(self, clip_val=1):
        super(ClippedReLU, self).__init__()
        self.clip_val = clip_val

    def forward(self, x):
        return torch.clamp(x, 0, self.clip_val)

class Reshape(nn.Module):
    def __init__(self):
```

```

        super(Reshape, self).__init__()

    def forward(self, x):
        dims = len(x.shape)
        return torch.transpose(x, dims-2, dims-1).reshape(x.shape[-3] if
↪dims==3 else 1, x.shape[-2]*x.shape[-1]).squeeze()

```

```

[ ]: layers = [ptm.nn.Embedding(num_embeddings=19, embedding_dim=quantum_layer.
↪input_shape[0]//n_aminoacids), Reshape()]
layers += [quantum_layer(), ptm.nn.Linear(1,1)]

```

```

[ ]: # layers = []
# for i in range(1, len(layers_dim)):
#     layers += [ptm.nn.Linear(layers_dim[-1*i], layers_dim[-1*(i+1)]), ptm.nn.
↪ReLU()]
# layers += [ptm.nn.Linear(layers_dim[0], layers_dim[0]), ClippedReLU()]
# layers += [quantum_layer()]
# # layers += [nn.Linear(1, 1)]
# # layers += [nn.Linear(2, 4), nn.ReLU()]
# # layers += [nn.Linear(4, 1)]

```

```

[ ]: # Create model and set data:
model = ptm.pytorch_model(
    layers,
    save_options = {'initial_path': initial_path, 'name_notebook':
↪name_notebook},
)
model.set_data(
    data_X=input_data,
    data_Y=target_data,
    data_X_validation=input_validation,
    data_Y_validation=target_validation
)

```

```

[ ]: x = input_data[0:2]
for i, layer in enumerate(model.model):
    x = layer(x)
    print(i, x.shape, x)

```

```

0 torch.Size([2, 4, 5]) tensor([[[[-1.1346,  0.5462, -1.3516,  0.9041, -1.2927],
    [-0.0891,  0.8278,  0.5477, -1.3102, -1.2461],
    [ 0.5552,  1.6280,  0.2475,  1.1846,  1.2027],
    [ 0.2820,  0.4058,  0.0841, -0.4611,  0.1700]],

```

```

    [[ 0.2884,  1.6460, -0.2311, -0.3078, -1.7481],
    [ 0.8847, -2.5227, -0.8462,  1.5590,  0.9098],
    [-0.2652, -0.2028,  0.7898, -1.5777,  1.5194],
    [ 0.5552,  1.6280,  0.2475,  1.1846,  1.2027]]],

```

```

        grad_fn=<EmbeddingBackward>)
1 torch.Size([2, 20]) tensor([[ -1.1346, -0.0891,  0.5552,  0.2820,  0.5462,
 0.8278,  1.6280,  0.4058,
    -1.3516,  0.5477,  0.2475,  0.0841,  0.9041, -1.3102,  1.1846, -0.4611,
    -1.2927, -1.2461,  1.2027,  0.1700],
    [ 0.2884,  0.8847, -0.2652,  0.5552,  1.6460, -2.5227, -0.2028,  1.6280,
    -0.2311, -0.8462,  0.7898,  0.2475, -0.3078,  1.5590, -1.5777,  1.1846,
    -1.7481,  0.9098,  1.5194,  1.2027]], grad_fn=<SqueezeBackward0>)
2 torch.Size([2, 1]) tensor([[ -0.0207],
    [ 0.0806]], grad_fn=<ViewBackward>)
3 torch.Size([2, 1]) tensor([[ -0.3408],
    [-0.3455]], grad_fn=<AddmmBackward>)

```

```

[ ]: for i in range(2):
    x = input_data[i]
    for i, layer in enumerate(model.model):
        x = layer(x)
        print(i, x.shape, x)

    print('')

```

```

0 torch.Size([4, 5]) tensor([[ -1.1346,  0.5462, -1.3516,  0.9041, -1.2927],
    [-0.0891,  0.8278,  0.5477, -1.3102, -1.2461],
    [ 0.5552,  1.6280,  0.2475,  1.1846,  1.2027],
    [ 0.2820,  0.4058,  0.0841, -0.4611,  0.1700]],
    grad_fn=<EmbeddingBackward>)
1 torch.Size([20]) tensor([ -1.1346, -0.0891,  0.5552,  0.2820,  0.5462,  0.8278,
 1.6280,  0.4058,
    -1.3516,  0.5477,  0.2475,  0.0841,  0.9041, -1.3102,  1.1846, -0.4611,
    -1.2927, -1.2461,  1.2027,  0.1700], grad_fn=<SqueezeBackward0>)
2 torch.Size([1]) tensor([ -0.0207], grad_fn=<CatBackward>)
3 torch.Size([1]) tensor([ -0.3408], grad_fn=<AddBackward0>)

0 torch.Size([4, 5]) tensor([[ 0.2884,  1.6460, -0.2311, -0.3078, -1.7481],
    [ 0.8847, -2.5227, -0.8462,  1.5590,  0.9098],
    [-0.2652, -0.2028,  0.7898, -1.5777,  1.5194],
    [ 0.5552,  1.6280,  0.2475,  1.1846,  1.2027]],
    grad_fn=<EmbeddingBackward>)
1 torch.Size([20]) tensor([ 0.2884,  0.8847, -0.2652,  0.5552,  1.6460, -2.5227,
 -0.2028,  1.6280,
    -0.2311, -0.8462,  0.7898,  0.2475, -0.3078,  1.5590, -1.5777,  1.1846,
    -1.7481,  0.9098,  1.5194,  1.2027], grad_fn=<SqueezeBackward0>)
2 torch.Size([1]) tensor([0.0806], grad_fn=<CatBackward>)
3 torch.Size([1]) tensor([ -0.3455], grad_fn=<AddBackward0>)

```

```

[ ]: print(model(input_data[0:2]))
    print(model(input_data[1]))

```

```

tensor([[ -0.3408],
        [ -0.3455]], grad_fn=<AddmmBackward>)
tensor([ -0.3455], grad_fn=<AddBackward0>)
tensor([ -0.3455], grad_fn=<AddBackward0>)

```

```
[ ]: model.keep_track_params=False,
```

```
[ ]: import torch.optim as optim

# ask the user if he wants to start the training
out = input("Do you want to start the training? (y/n) ")
if out != 'y':
    sys.exit()

# train the model
model.train(
    optimizer= optim.SGD,
    optimizer_options={'lr': 1},
    num_epochs = 50,
    batch_size = 32,
    initialization_options = [
        {
            'type': 'normal_',
            'layer': len(model.model)-1,
            'name': 'bias',
            'options': {'mean': 100, 'std': 10},
        },{
            'type': 'normal_',
            'layer': len(model.model)-1,
            'name': 'weight',
            'options': {'mean': 200, 'std': 10},
        },
    ]
)

```

```

Epoch [0/50], Loss: 1.1285, Loss validation: 1.1992
    Validation string,      i: 0;  prediction: 12.1711,  target:
-62.7310,      loss: 1.1940
    Validation string,      i: 1;  prediction: 174.7702,  target:
-74.7800,      loss: 3.3371
    Validation string,      i: 2;  prediction: 116.2745,  target:
-57.5150,      loss: 3.0216
Epoch [1/50], Loss: 1.1701, Loss validation: 1.2519, Time remaining: ~1.0h 35.0m
38s
    Validation string,      i: 0;  prediction: 29.5877,  target:
-62.7310,      loss: 1.4717
    Validation string,      i: 1;  prediction: 36.6309,  target:
-74.7800,      loss: 1.4898

```

Validation string, i: 2; prediction: 96.4102, target:  
-57.5150, loss: 2.6763  
Epoch [2/50], Loss: 1.1662, Loss validation: 1.2167, Time remaining: ~1.0h 29.0m  
12s

Validation string, i: 0; prediction: 17.3463, target:  
-62.7310, loss: 1.2765

Validation string, i: 1; prediction: 41.7236, target:  
-74.7800, loss: 1.5580

Validation string, i: 2; prediction: 122.9383, target:  
-57.5150, loss: 3.1375

Epoch [3/50], Loss: 1.1485, Loss validation: 1.1671, Time remaining: ~1.0h 25.0m  
60s

Validation string, i: 0; prediction: 65.4673, target:  
-62.7310, loss: 2.0436

Validation string, i: 1; prediction: 126.5021, target:  
-74.7800, loss: 2.6917

Validation string, i: 2; prediction: 68.9470, target:  
-57.5150, loss: 2.1988

Epoch [4/50], Loss: 1.1508, Loss validation: 1.1795, Time remaining: ~1.0h 23.0m  
31s

Validation string, i: 0; prediction: 48.7301, target:  
-62.7310, loss: 1.7768

Validation string, i: 1; prediction: 54.5178, target:  
-74.7800, loss: 1.7290

Validation string, i: 2; prediction: 158.0258, target:  
-57.5150, loss: 3.7476

Epoch [5/50], Loss: 1.1438, Loss validation: 1.2162, Time remaining: ~1.0h 21.0m  
20s

Validation string, i: 0; prediction: 115.7611, target:  
-62.7310, loss: 2.8454

Validation string, i: 1; prediction: 104.1283, target:  
-74.7800, loss: 2.3925

Validation string, i: 2; prediction: 58.4907, target:  
-57.5150, loss: 2.0170

Epoch [6/50], Loss: 1.1602, Loss validation: 1.1699, Time remaining: ~1.0h 19.0m  
15s

Validation string, i: 0; prediction: -27.0819, target:  
-62.7310, loss: 0.5683

Validation string, i: 1; prediction: 98.3338, target:  
-74.7800, loss: 2.3150

Validation string, i: 2; prediction: 126.3666, target:  
-57.5150, loss: 3.1971

Epoch [7/50], Loss: 1.1411, Loss validation: 1.2119, Time remaining: ~1.0h 17.0m  
20s

Validation string, i: 0; prediction: 1.6271, target:  
-62.7310, loss: 1.0259

Validation string, i: 1; prediction: 36.8989, target:  
-74.7800, loss: 1.4934

Validation string, i: 2; prediction: 42.3609, target:  
-57.5150, loss: 1.7365  
Epoch [8/50], Loss: 1.1444, Loss validation: 1.1637, Time remaining: ~1.0h 15.0m  
27s

Validation string, i: 0; prediction: 52.3458, target:  
-62.7310, loss: 1.8344

Validation string, i: 1; prediction: 108.0319, target:  
-74.7800, loss: 2.4447

Validation string, i: 2; prediction: 107.5565, target:  
-57.5150, loss: 2.8701

Epoch [9/50], Loss: 1.1303, Loss validation: 1.2266, Time remaining: ~1.0h 13.0m  
35s

Validation string, i: 0; prediction: 55.1400, target:  
-62.7310, loss: 1.8790

Validation string, i: 1; prediction: 115.1284, target:  
-74.7800, loss: 2.5396

Validation string, i: 2; prediction: 44.8757, target:  
-57.5150, loss: 1.7802

Epoch [10/50], Loss: 1.1351, Loss validation: 1.1566, Time remaining: ~1.0h  
11.0m 46s

Validation string, i: 0; prediction: 52.0017, target:  
-62.7310, loss: 1.8290

Validation string, i: 1; prediction: 35.7960, target:  
-74.7800, loss: 1.4787

Validation string, i: 2; prediction: 71.2356, target:  
-57.5150, loss: 2.2386

Epoch [11/50], Loss: 1.1286, Loss validation: 1.1843, Time remaining: ~1.0h 9.0m  
55s

Validation string, i: 0; prediction: 66.4336, target:  
-62.7310, loss: 2.0590

Validation string, i: 1; prediction: 105.2657, target:  
-74.7800, loss: 2.4077

Validation string, i: 2; prediction: 165.9931, target:  
-57.5150, loss: 3.8861

Epoch [12/50], Loss: 1.1274, Loss validation: 1.1718, Time remaining: ~1.0h 8.0m  
7s

Validation string, i: 0; prediction: 178.3953, target:  
-62.7310, loss: 3.8438

Validation string, i: 1; prediction: 137.6080, target:  
-74.7800, loss: 2.8402

Validation string, i: 2; prediction: 168.4259, target:  
-57.5150, loss: 3.9284

Epoch [13/50], Loss: 1.1288, Loss validation: 1.2259, Time remaining: ~1.0h 6.0m  
20s

Validation string, i: 0; prediction: 162.8703, target:  
-62.7310, loss: 3.5963

Validation string, i: 1; prediction: 74.6805, target:  
-74.7800, loss: 1.9987



Validation string, i: 2; prediction: -11.6928, target:  
-57.5150, loss: 0.7967  
Epoch [14/50], Loss: 1.1189, Loss validation: 1.2110, Time remaining: ~1.0h 4.0m  
34s

Validation string, i: 0; prediction: 126.5959, target:  
-62.7310, loss: 3.0181

Validation string, i: 1; prediction: 26.7057, target:  
-74.7800, loss: 1.3571

Validation string, i: 2; prediction: 51.4215, target:  
-57.5150, loss: 1.8941

Epoch [15/50], Loss: 1.1274, Loss validation: 1.1574, Time remaining: ~1.0h 2.0m  
48s

Validation string, i: 0; prediction: 143.1667, target:  
-62.7310, loss: 3.2822

Validation string, i: 1; prediction: 168.5403, target:  
-74.7800, loss: 3.2538

Validation string, i: 2; prediction: -44.7875, target:  
-57.5150, loss: 0.2213

Epoch [16/50], Loss: 1.1118, Loss validation: 1.2406, Time remaining: ~1.0h 1.0m  
3s

Validation string, i: 0; prediction: 0.6744, target:  
-62.7310, loss: 1.0108

Validation string, i: 1; prediction: -41.3449, target:  
-74.7800, loss: 0.4471

Validation string, i: 2; prediction: 85.9960, target:  
-57.5150, loss: 2.4952

Epoch [17/50], Loss: 1.1120, Loss validation: 1.0896, Time remaining: ~0.0h  
59.0m 16s

Validation string, i: 0; prediction: 151.8959, target:  
-62.7310, loss: 3.4214

Validation string, i: 1; prediction: 57.1490, target:  
-74.7800, loss: 1.7642

Validation string, i: 2; prediction: -27.0052, target:  
-57.5150, loss: 0.5305

Epoch [18/50], Loss: 1.1054, Loss validation: 1.2327, Time remaining: ~0.0h  
57.0m 29s

Validation string, i: 0; prediction: 31.6293, target:  
-62.7310, loss: 1.5042

Validation string, i: 1; prediction: 19.0216, target:  
-74.7800, loss: 1.2544

Validation string, i: 2; prediction: 137.1793, target:  
-57.5150, loss: 3.3851

Epoch [19/50], Loss: 1.1088, Loss validation: 1.1757, Time remaining: ~0.0h  
55.0m 41s

Validation string, i: 0; prediction: 76.8370, target:  
-62.7310, loss: 2.2249

Validation string, i: 1; prediction: 40.0670, target:  
-74.7800, loss: 1.5358

Validation string, i: 2; prediction: 130.8335, target:  
-57.5150, loss: 3.2748  
Epoch [20/50], Loss: 1.0890, Loss validation: 1.0834, Time remaining: ~0.0h  
53.0m 55s

Validation string, i: 0; prediction: 15.7257, target:  
-62.7310, loss: 1.2507  
Validation string, i: 1; prediction: 120.1533, target:  
-74.7800, loss: 2.6068  
Validation string, i: 2; prediction: -10.1701, target:  
-57.5150, loss: 0.8232  
Epoch [21/50], Loss: 1.0450, Loss validation: 1.0147, Time remaining: ~0.0h  
52.0m 8s

Validation string, i: 0; prediction: 49.7842, target:  
-62.7310, loss: 1.7936  
Validation string, i: 1; prediction: -6.9357, target:  
-74.7800, loss: 0.9073  
Validation string, i: 2; prediction: 180.7921, target:  
-57.5150, loss: 4.1434  
Epoch [22/50], Loss: 1.0498, Loss validation: 1.0689, Time remaining: ~0.0h  
50.0m 21s

Validation string, i: 0; prediction: 92.2728, target:  
-62.7310, loss: 2.4709  
Validation string, i: 1; prediction: 119.8516, target:  
-74.7800, loss: 2.6027  
Validation string, i: 2; prediction: 29.7031, target:  
-57.5150, loss: 1.5164  
Epoch [23/50], Loss: 1.0406, Loss validation: 1.1685, Time remaining: ~0.0h  
48.0m 34s

Validation string, i: 0; prediction: 129.6016, target:  
-62.7310, loss: 3.0660  
Validation string, i: 1; prediction: 3.0430, target:  
-74.7800, loss: 1.0407  
Validation string, i: 2; prediction: 145.0512, target:  
-57.5150, loss: 3.5220  
Epoch [24/50], Loss: 1.0307, Loss validation: 1.2286, Time remaining: ~0.0h  
46.0m 47s

Validation string, i: 0; prediction: 16.5127, target:  
-62.7310, loss: 1.2632  
Validation string, i: 1; prediction: 136.8169, target:  
-74.7800, loss: 2.8296  
Validation string, i: 2; prediction: 67.0128, target:  
-57.5150, loss: 2.1651  
Epoch [25/50], Loss: 1.0240, Loss validation: 1.1949, Time remaining: ~0.0h  
44.0m 60s

Validation string, i: 0; prediction: 26.7480, target:  
-62.7310, loss: 1.4264  
Validation string, i: 1; prediction: 90.6563, target:  
-74.7800, loss: 2.2123

Validation string, i: 2; prediction: 106.5674, target:  
-57.5150, loss: 2.8529  
Epoch [26/50], Loss: 1.0319, Loss validation: 1.0879, Time remaining: ~0.0h  
43.0m 13s

Validation string, i: 0; prediction: 71.3885, target:  
-62.7310, loss: 2.1380  
Validation string, i: 1; prediction: 58.8452, target:  
-74.7800, loss: 1.7869  
Validation string, i: 2; prediction: 40.4876, target:  
-57.5150, loss: 1.7039  
Epoch [27/50], Loss: 1.0204, Loss validation: 1.0416, Time remaining: ~0.0h  
41.0m 26s

Validation string, i: 0; prediction: 63.1742, target:  
-62.7310, loss: 2.0071  
Validation string, i: 1; prediction: 128.9562, target:  
-74.7800, loss: 2.7245  
Validation string, i: 2; prediction: 60.1378, target:  
-57.5150, loss: 2.0456  
Epoch [28/50], Loss: 1.0142, Loss validation: 1.0916, Time remaining: ~0.0h  
39.0m 38s

Validation string, i: 0; prediction: -14.7361, target:  
-62.7310, loss: 0.7651  
Validation string, i: 1; prediction: 21.8664, target:  
-74.7800, loss: 1.2924  
Validation string, i: 2; prediction: 33.1743, target:  
-57.5150, loss: 1.5768  
Epoch [29/50], Loss: 1.0148, Loss validation: 0.9735, Time remaining: ~0.0h  
37.0m 51s

Validation string, i: 0; prediction: 100.2643, target:  
-62.7310, loss: 2.5983  
Validation string, i: 1; prediction: 54.9589, target:  
-74.7800, loss: 1.7349  
Validation string, i: 2; prediction: 45.8989, target:  
-57.5150, loss: 1.7980  
Epoch [30/50], Loss: 1.0058, Loss validation: 1.0859, Time remaining: ~0.0h  
36.0m 3s

Validation string, i: 0; prediction: 131.0123, target:  
-62.7310, loss: 3.0885  
Validation string, i: 1; prediction: 55.6530, target:  
-74.7800, loss: 1.7442  
Validation string, i: 2; prediction: -31.5286, target:  
-57.5150, loss: 0.4518  
Epoch [31/50], Loss: 1.0118, Loss validation: 1.0626, Time remaining: ~0.0h  
34.0m 16s

Validation string, i: 0; prediction: 20.9838, target:  
-62.7310, loss: 1.3345  
Validation string, i: 1; prediction: -19.0580, target:  
-74.7800, loss: 0.7451

Validation string, i: 2; prediction: 97.4119, target:  
 -57.5150, loss: 2.6937  
 Epoch [32/50], Loss: 0.9939, Loss validation: 1.0599, Time remaining: ~0.0h  
 32.0m 28s

Validation string, i: 0; prediction: 61.9833, target:  
 -62.7310, loss: 1.9881  
 Validation string, i: 1; prediction: 61.4514, target:  
 -74.7800, loss: 1.8218  
 Validation string, i: 2; prediction: -32.9834, target:  
 -57.5150, loss: 0.4265  
 Epoch [33/50], Loss: 0.9760, Loss validation: 1.0078, Time remaining: ~0.0h  
 30.0m 41s

Validation string, i: 0; prediction: 90.9587, target:  
 -62.7310, loss: 2.4500  
 Validation string, i: 1; prediction: 125.1890, target:  
 -74.7800, loss: 2.6741  
 Validation string, i: 2; prediction: 24.6778, target:  
 -57.5150, loss: 1.4291  
 Epoch [34/50], Loss: 0.9881, Loss validation: 1.0024, Time remaining: ~0.0h  
 28.0m 54s

Validation string, i: 0; prediction: 132.3946, target:  
 -62.7310, loss: 3.1105  
 Validation string, i: 1; prediction: 44.3805, target:  
 -74.7800, loss: 1.5935  
 Validation string, i: 2; prediction: 14.5167, target:  
 -57.5150, loss: 1.2524  
 Epoch [35/50], Loss: 0.9881, Loss validation: 1.0868, Time remaining: ~0.0h  
 27.0m 6s

Validation string, i: 0; prediction: 137.7887, target:  
 -62.7310, loss: 3.1965  
 Validation string, i: 1; prediction: 126.3415, target:  
 -74.7800, loss: 2.6895  
 Validation string, i: 2; prediction: 84.5480, target:  
 -57.5150, loss: 2.4700  
 Epoch [36/50], Loss: 1.0012, Loss validation: 1.1676, Time remaining: ~0.0h  
 25.0m 18s

Validation string, i: 0; prediction: -20.8806, target:  
 -62.7310, loss: 0.6671  
 Validation string, i: 1; prediction: 82.9640, target:  
 -74.7800, loss: 2.1094  
 Validation string, i: 2; prediction: 43.2248, target:  
 -57.5150, loss: 1.7515  
 Epoch [37/50], Loss: 1.0120, Loss validation: 0.9705, Time remaining: ~0.0h  
 23.0m 30s

Validation string, i: 0; prediction: -13.9962, target:  
 -62.7310, loss: 0.7769  
 Validation string, i: 1; prediction: 67.7635, target:  
 -74.7800, loss: 1.9062

Validation string, i: 2; prediction: 113.0423, target:  
 -57.5150, loss: 2.9654  
 Epoch [38/50], Loss: 1.0097, Loss validation: 1.0283, Time remaining: ~0.0h  
 21.0m 42s

Validation string, i: 0; prediction: 91.4276, target:  
 -62.7310, loss: 2.4575  
 Validation string, i: 1; prediction: 73.5997, target:  
 -74.7800, loss: 1.9842  
 Validation string, i: 2; prediction: 73.6532, target:  
 -57.5150, loss: 2.2806  
 Epoch [39/50], Loss: 1.0126, Loss validation: 1.1160, Time remaining: ~0.0h  
 19.0m 54s

Validation string, i: 0; prediction: 54.2075, target:  
 -62.7310, loss: 1.8641  
 Validation string, i: 1; prediction: 118.6797, target:  
 -74.7800, loss: 2.5871  
 Validation string, i: 2; prediction: 17.0495, target:  
 -57.5150, loss: 1.2964  
 Epoch [40/50], Loss: 0.9977, Loss validation: 1.1042, Time remaining: ~0.0h  
 18.0m 6s

Validation string, i: 0; prediction: 88.2934, target:  
 -62.7310, loss: 2.4075  
 Validation string, i: 1; prediction: 40.8026, target:  
 -74.7800, loss: 1.5456  
 Validation string, i: 2; prediction: 76.1789, target:  
 -57.5150, loss: 2.3245  
 Epoch [41/50], Loss: 0.9894, Loss validation: 1.1432, Time remaining: ~0.0h  
 16.0m 17s

Validation string, i: 0; prediction: -18.4652, target:  
 -62.7310, loss: 0.7056  
 Validation string, i: 1; prediction: 15.1695, target:  
 -74.7800, loss: 1.2029  
 Validation string, i: 2; prediction: 142.4551, target:  
 -57.5150, loss: 3.4768  
 Epoch [42/50], Loss: 0.9834, Loss validation: 1.1148, Time remaining: ~0.0h  
 14.0m 29s

Validation string, i: 0; prediction: 47.8033, target:  
 -62.7310, loss: 1.7620  
 Validation string, i: 1; prediction: 126.6310, target:  
 -74.7800, loss: 2.6934  
 Validation string, i: 2; prediction: 19.8448, target:  
 -57.5150, loss: 1.3450  
 Epoch [43/50], Loss: 0.9758, Loss validation: 1.0909, Time remaining: ~0.0h  
 12.0m 43s

Validation string, i: 0; prediction: 26.7438, target:  
 -62.7310, loss: 1.4263  
 Validation string, i: 1; prediction: 93.2971, target:  
 -74.7800, loss: 2.2476

Validation string, i: 2; prediction: 34.0935, target:  
 -57.5150, loss: 1.5928  
 Epoch [44/50], Loss: 0.9789, Loss validation: 0.9891, Time remaining: ~0.0h  
 10.0m 56s

Validation string, i: 0; prediction: -20.9742, target:  
 -62.7310, loss: 0.6656  
 Validation string, i: 1; prediction: 128.8531, target:  
 -74.7800, loss: 2.7231  
 Validation string, i: 2; prediction: 73.2633, target:  
 -57.5150, loss: 2.2738  
 Epoch [45/50], Loss: 0.9537, Loss validation: 1.1420, Time remaining: ~0.0h 9.0m  
 9s

Validation string, i: 0; prediction: 142.8031, target:  
 -62.7310, loss: 3.2764  
 Validation string, i: 1; prediction: -30.8509, target:  
 -74.7800, loss: 0.5874  
 Validation string, i: 2; prediction: 109.7593, target:  
 -57.5150, loss: 2.9084  
 Epoch [46/50], Loss: 0.9706, Loss validation: 1.1207, Time remaining: ~0.0h 7.0m  
 22s

Validation string, i: 0; prediction: 27.2486, target:  
 -62.7310, loss: 1.4344  
 Validation string, i: 1; prediction: 87.3799, target:  
 -74.7800, loss: 2.1685  
 Validation string, i: 2; prediction: 59.4248, target:  
 -57.5150, loss: 2.0332  
 Epoch [47/50], Loss: 0.9999, Loss validation: 1.1560, Time remaining: ~0.0h 5.0m  
 32s

Validation string, i: 0; prediction: 114.7272, target:  
 -62.7310, loss: 2.8289  
 Validation string, i: 1; prediction: 38.7371, target:  
 -74.7800, loss: 1.5180  
 Validation string, i: 2; prediction: 104.9492, target:  
 -57.5150, loss: 2.8247  
 Epoch [48/50], Loss: 0.9935, Loss validation: 1.1919, Time remaining: ~0.0h 3.0m  
 41s

Validation string, i: 0; prediction: 57.0463, target:  
 -62.7310, loss: 1.9094  
 Validation string, i: 1; prediction: 95.3492, target:  
 -74.7800, loss: 2.2751  
 Validation string, i: 2; prediction: 1.7560, target:  
 -57.5150, loss: 1.0305  
 Epoch [49/50], Loss: 0.9873, Loss validation: 1.0681, Time remaining: ~0.0h 1.0m  
 51s

Validation string, i: 0; prediction: 53.6961, target:  
 -62.7310, loss: 1.8560  
 Validation string, i: 1; prediction: 41.4627, target:  
 -74.7800, loss: 1.5545

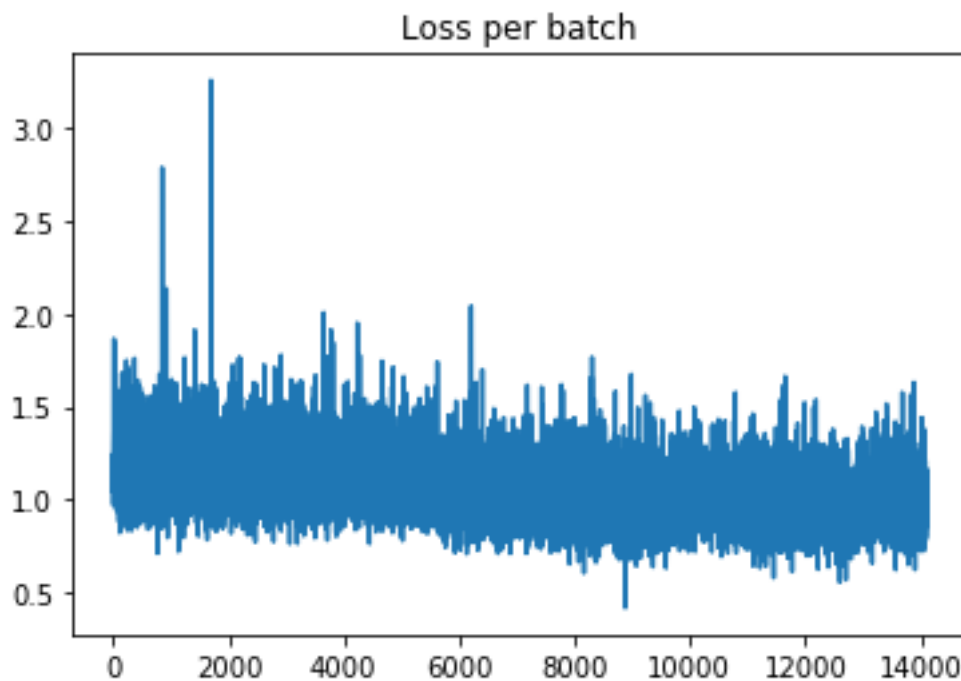
```
Validation string,      i: 2;  prediction: 73.3394,    target:
-57.5150,      loss: 2.2751
Epoch [50/50], Loss: 0.9673, Loss validation: 0.8994, Time remaining: ~0.0h 0.0m
0s
```

```
[ ]: # save string of the model
model.save_str(
    metadata={
        "data_file_path": data_file_path,
    }
)
```

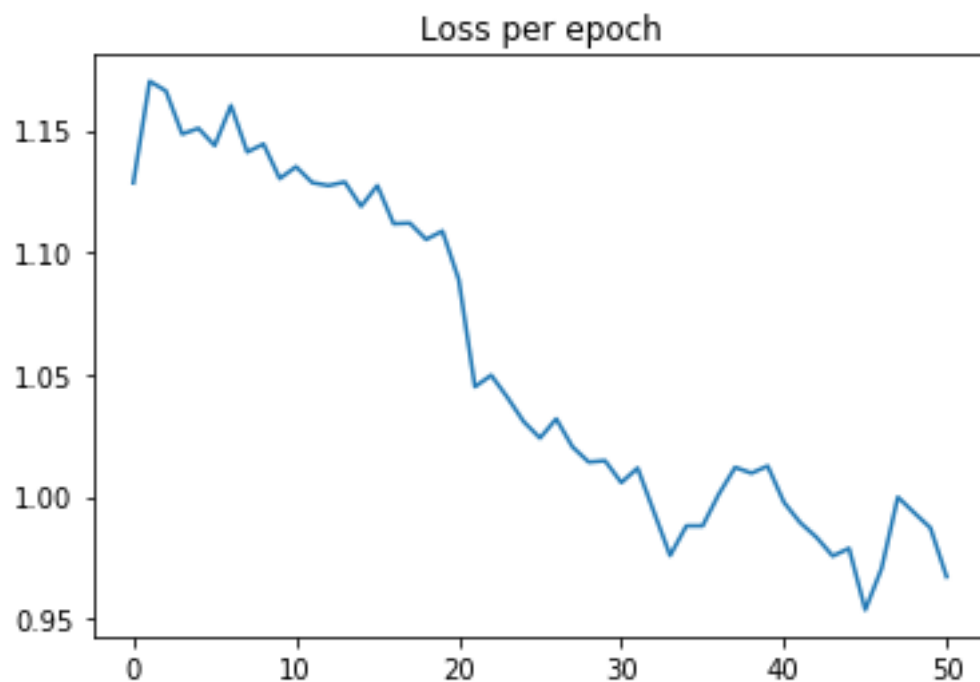
Saved in: peptide-QML/checkpoints/0810/txts/0810-sh\_em\_1qm\_v2\_model\_str\_6.txt

```
[ ]: # plot the losses of the training loop and save the figures
model.plot_losses(save=True)
```

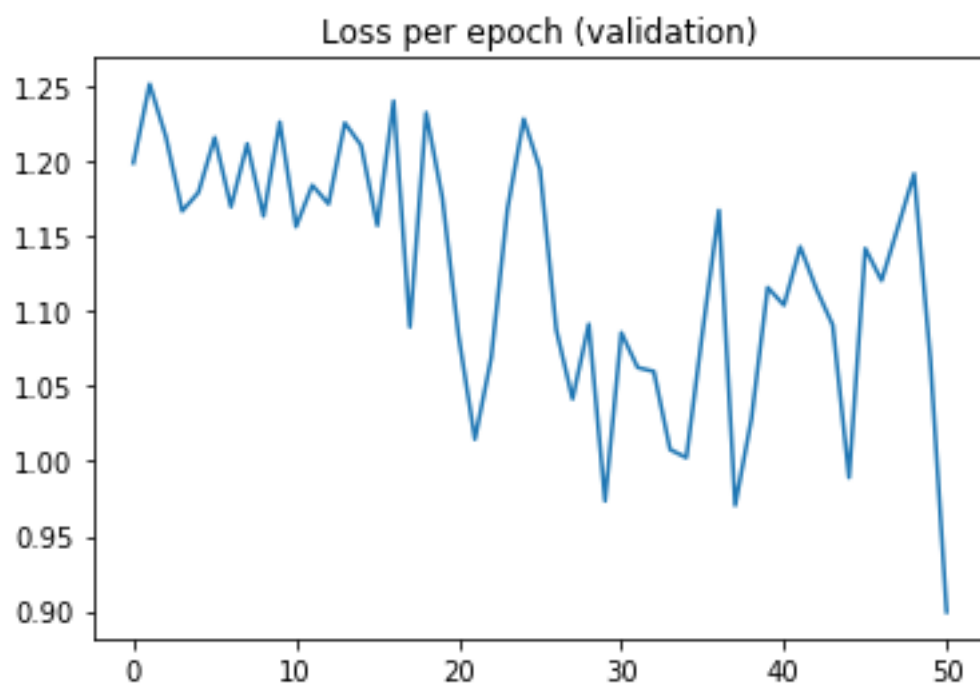
Saved in: peptide-  
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_losses\_batches\_6.png



Saved in: peptide-  
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_losses\_epoch\_6.png



Saved in: peptide-  
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_losses\_epoch\_validation\_6.png

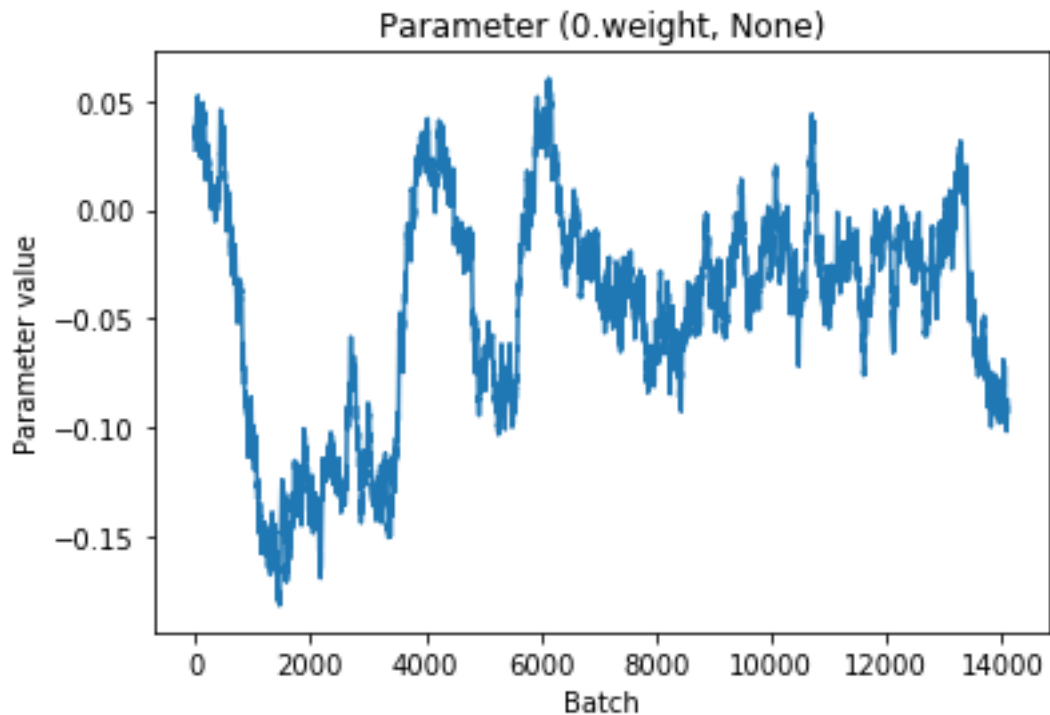




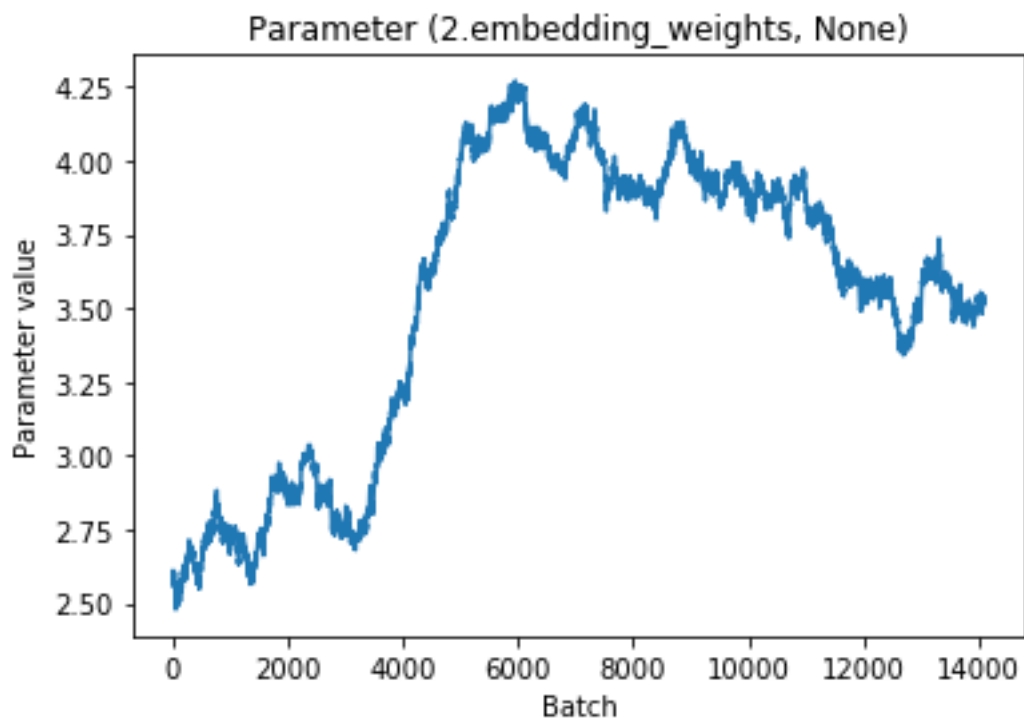
```
[ ]: # plot how the average of the parameters in each layer changes over time, and
      ↪ save that
for layer in model.model.state_dict().keys():
    model.plot_parameter(layer=layer, save=True)
```

Saved in: peptide-

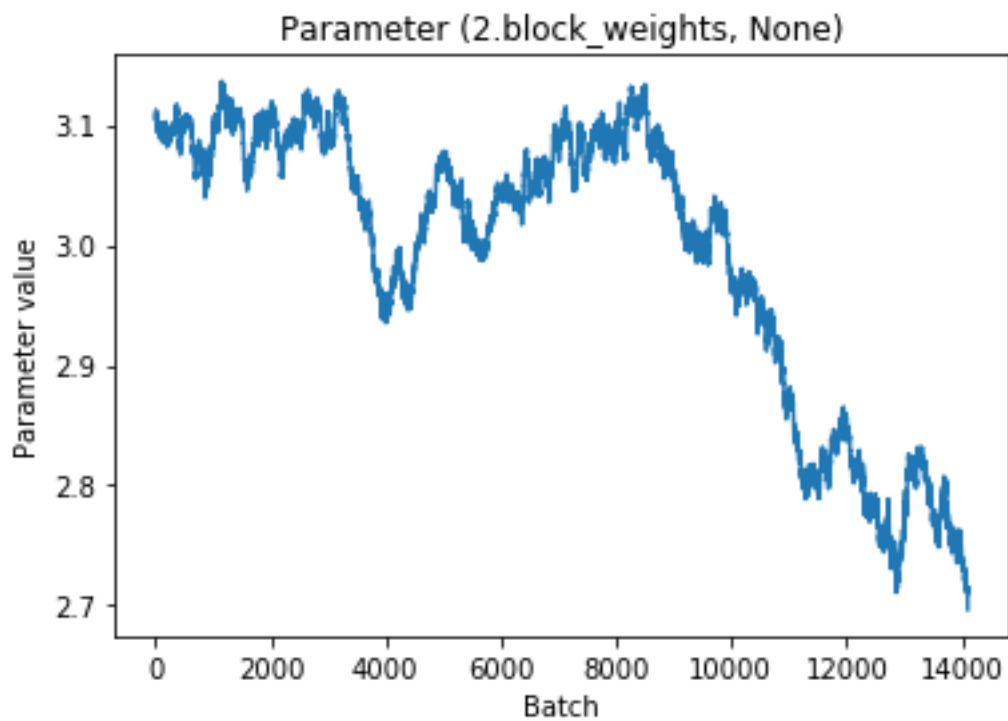
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_parameter\_0.weight\_None\_6.png



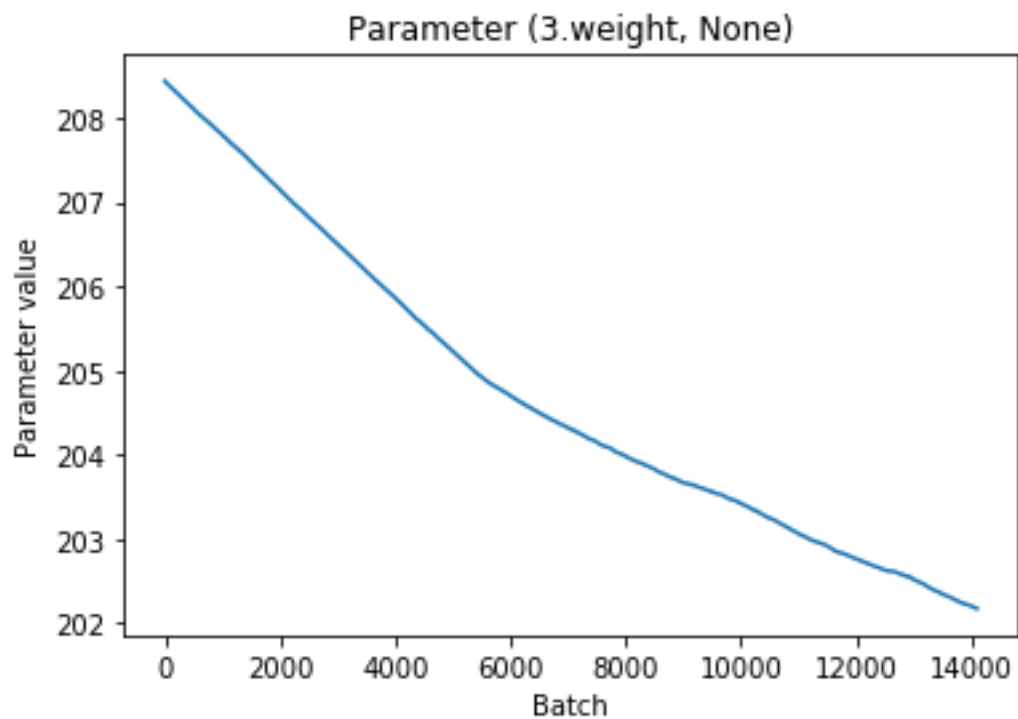
Saved in: peptide-QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_parameter\_2.embedding\_weights\_None\_6.png



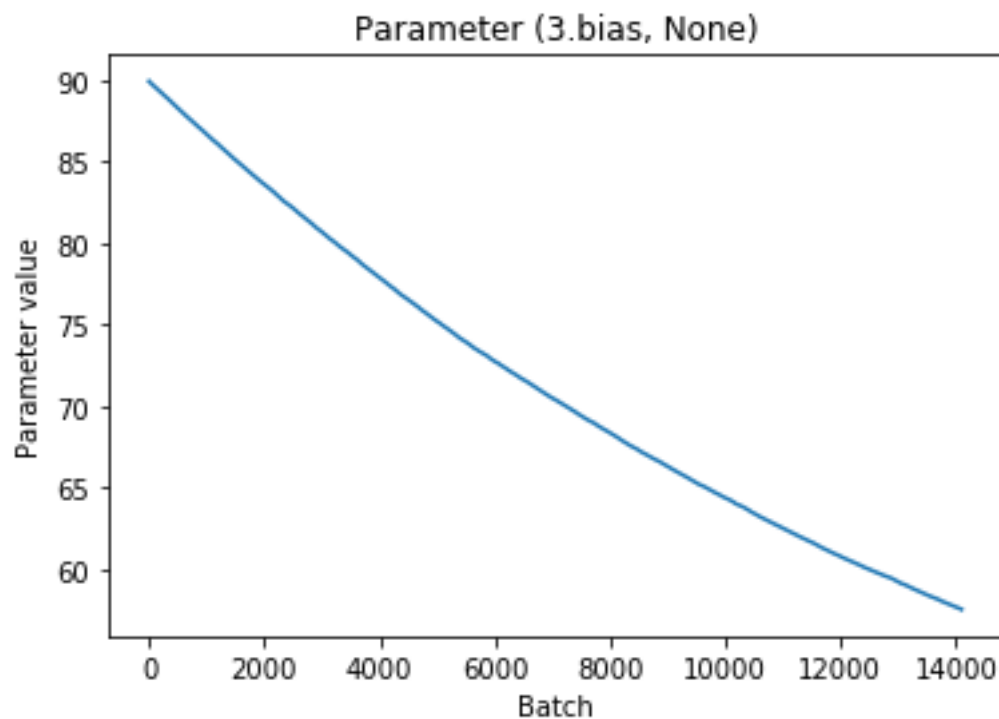
Saved in: peptide-QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_parameter\_2.block\_weights\_None\_6.png



Saved in: peptide-  
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_parameter\_3.weight\_None\_6.png



Saved in: peptide-  
QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_parameter\_3.bias\_None\_6.png



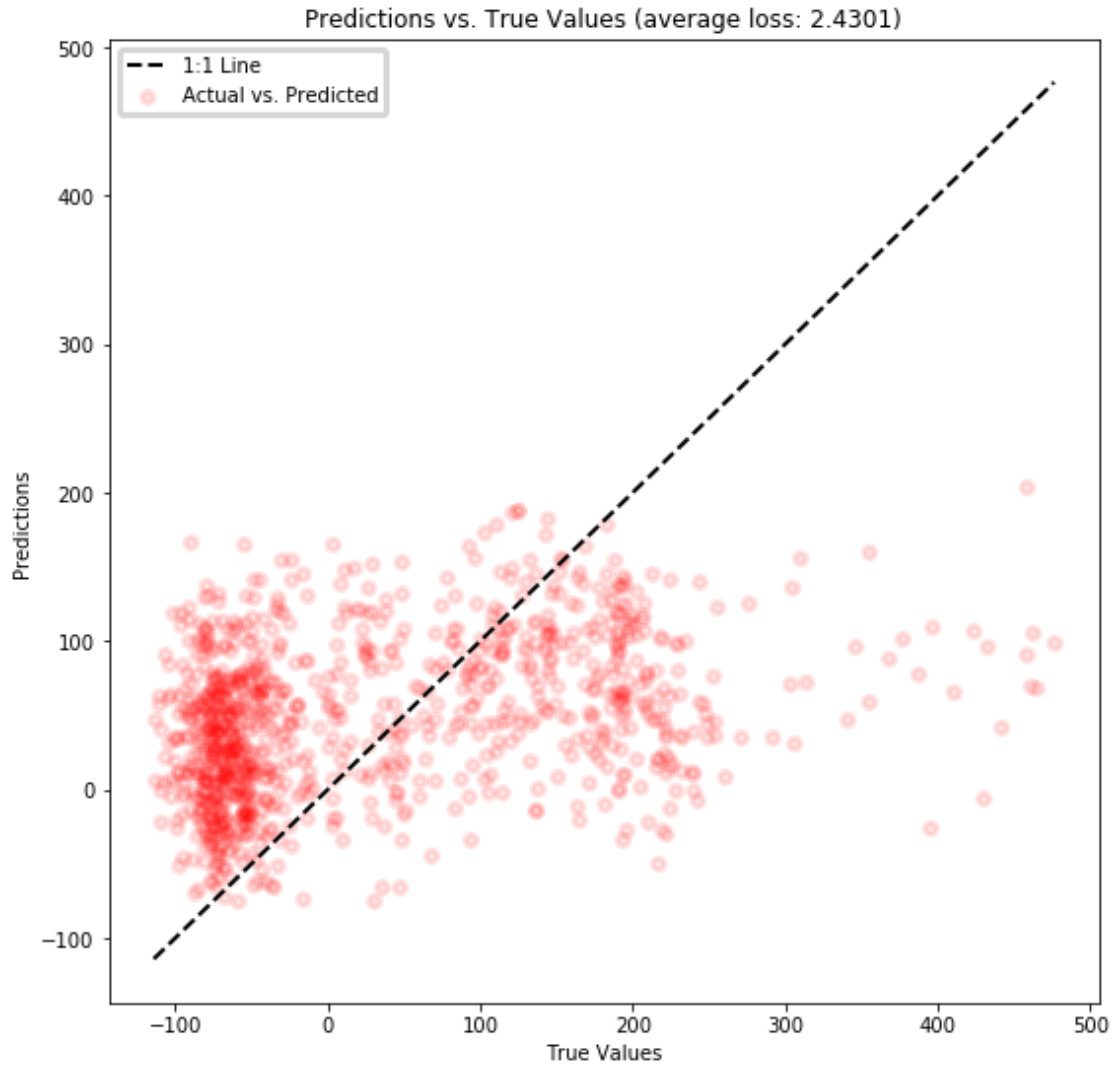
```
[ ]: # model.plot_parameter(layer='7.weights', index=50)
```

```
[ ]: #save all the parameters of the model and the intermediate parameters of the
      ↪model
      model.save_state_dict(intermediate=False)
```

Model saved as peptide-QML/checkpoints/0810/models/0810-sh\_em\_1qm\_v2\_6.pth

```
[ ]: model.plot_validation(save=True, fig_size=(9,9))
```

Saved in: peptide-QML/checkpoints/0810/plots/0810-sh\_em\_1qm\_v2\_validation\_6.png



```
[ ]: # print validation and save it
model.print_validation(save=True, precision=4, percentatge=1)
```

i: 0,	target: -62.7310,	prediction: 53.6961,	loss: 1.8560
i: 1,	target: 215.6070,	prediction: 21.1458,	loss: 0.9019
i: 2,	target: 32.4500,	prediction: 46.7349,	loss: 0.4402
i: 3,	target: -58.9450,	prediction: 77.0251,	loss: 2.3067
i: 4,	target: -104.9950,	prediction: 61.3873,	loss: 1.5847
i: 5,	target: 248.8490,	prediction: 35.0155,	loss: 0.8593
i: 6,	target: 219.8570,	prediction: 55.0034,	loss: 0.7498
i: 7,	target: 313.7060,	prediction: 72.3572,	loss: 0.7693
i: 8,	target: 0.2170,	prediction: 57.3217,	loss: 263.1551
i: 9,	target: 189.7160,	prediction: 97.9663,	loss: 0.4836
i: 10,	target: -74.7800,	prediction: 41.4627,	loss: 1.5545

i: 11,	target: -44.1060,	prediction: 68.5129,	loss: 2.5534
i: 12,	target: -62.6080,	prediction: 106.7490,	loss: 2.7050
i: 13,	target: 132.3460,	prediction: 18.7518,	loss: 0.8583
i: 14,	target: 260.0260,	prediction: 8.2740,	loss: 0.9682
i: 15,	target: 178.5230,	prediction: 31.8645,	loss: 0.8215
i: 16,	target: -20.4580,	prediction: -4.1059,	loss: 0.7993
i: 17,	target: -34.5420,	prediction: 5.7455,	loss: 1.1663
i: 18,	target: -53.1190,	prediction: -3.7134,	loss: 0.9301
i: 19,	target: 191.4570,	prediction: 65.6335,	loss: 0.6572
i: 20,	target: -57.5150,	prediction: 73.3394,	loss: 2.2751
i: 21,	target: -40.2140,	prediction: 14.6401,	loss: 1.3641
i: 22,	target: -60.2670,	prediction: 27.1649,	loss: 1.4507
i: 23,	target: -42.1620,	prediction: 60.0383,	loss: 2.4240
i: 24,	target: -74.3080,	prediction: 18.8862,	loss: 1.2542
i: 25,	target: 193.6570,	prediction: 140.8454,	loss: 0.2727
i: 26,	target: -89.0970,	prediction: 53.4903,	loss: 1.6004
i: 27,	target: -72.0880,	prediction: -49.6000,	loss: 0.3120
i: 28,	target: 457.9120,	prediction: 91.4026,	loss: 0.8004
i: 29,	target: -20.3410,	prediction: 55.9731,	loss: 3.7517
i: 30,	target: 67.8960,	prediction: -45.0043,	loss: 1.6628
i: 31,	target: 77.6140,	prediction: 143.0150,	loss: 0.8426
i: 32,	target: -39.4110,	prediction: 50.9088,	loss: 2.2917
i: 33,	target: 170.3080,	prediction: 37.2151,	loss: 0.7815
i: 34,	target: 64.6330,	prediction: 42.9493,	loss: 0.3355
i: 35,	target: -60.6990,	prediction: -5.1458,	loss: 0.9152
i: 36,	target: 105.6700,	prediction: 10.2945,	loss: 0.9026
i: 37,	target: 21.7480,	prediction: 98.4373,	loss: 3.5263
i: 38,	target: -57.2710,	prediction: 67.7167,	loss: 2.1824
i: 39,	target: -44.9690,	prediction: 73.0323,	loss: 2.6241
i: 40,	target: -62.8980,	prediction: 20.9410,	loss: 1.3329
i: 41,	target: 107.5620,	prediction: 117.8515,	loss: 0.0957
i: 42,	target: -65.7280,	prediction: 72.5547,	loss: 2.1039
i: 43,	target: -72.9960,	prediction: 28.5813,	loss: 1.3915
i: 44,	target: -3.9520,	prediction: 65.4970,	loss: 17.5731
i: 45,	target: -87.3910,	prediction: -69.4300,	loss: 0.2055
i: 46,	target: 90.8630,	prediction: 78.4915,	loss: 0.1362
i: 47,	target: 228.6080,	prediction: 80.2942,	loss: 0.6488
i: 48,	target: 4.7990,	prediction: 97.5557,	loss: 19.3283
i: 49,	target: -46.6590,	prediction: 44.8744,	loss: 1.9618
i: 50,	target: -76.7440,	prediction: 47.6149,	loss: 1.6204
i: 51,	target: -42.1320,	prediction: 82.7512,	loss: 2.9641
i: 52,	target: 168.9560,	prediction: 164.0560,	loss: 0.0290
i: 53,	target: 143.4150,	prediction: 105.3290,	loss: 0.2656
i: 54,	target: -87.8770,	prediction: -4.7053,	loss: 0.9465
i: 55,	target: 136.1860,	prediction: 112.9519,	loss: 0.1706
i: 56,	target: 191.6680,	prediction: 137.8251,	loss: 0.2809
i: 57,	target: -98.8460,	prediction: -25.7656,	loss: 0.7393
i: 58,	target: 35.2440,	prediction: 81.8951,	loss: 1.3237

i: 59,	target: 223.9600,	prediction: 142.0884,	loss: 0.3656
i: 60,	target: -25.8690,	prediction: 50.5499,	loss: 2.9541
i: 61,	target: 224.2780,	prediction: -12.7739,	loss: 1.0570
i: 62,	target: -13.7540,	prediction: 23.2186,	loss: 2.6881
i: 63,	target: 4.6170,	prediction: 53.5585,	loss: 10.6003
i: 64,	target: 144.4420,	prediction: 80.0132,	loss: 0.4461
i: 65,	target: -61.6220,	prediction: 32.5994,	loss: 1.5290
i: 66,	target: -32.4100,	prediction: -33.5046,	loss: 0.0338
i: 67,	target: -82.2640,	prediction: -0.8483,	loss: 0.9897
i: 68,	target: 234.5690,	prediction: 100.7793,	loss: 0.5704
i: 69,	target: -82.4540,	prediction: 23.0402,	loss: 1.2794
i: 70,	target: -49.2260,	prediction: 65.3012,	loss: 2.3266
i: 71,	target: -64.6460,	prediction: -39.9832,	loss: 0.3815
i: 72,	target: -85.5280,	prediction: 112.7193,	loss: 2.3179
i: 73,	target: 112.7450,	prediction: 91.6033,	loss: 0.1875
i: 74,	target: -24.9910,	prediction: -24.4469,	loss: 0.0218
i: 75,	target: -54.0420,	prediction: -30.2538,	loss: 0.4402
i: 76,	target: -80.8870,	prediction: 109.8982,	loss: 2.3587
i: 77,	target: -75.8670,	prediction: 23.9396,	loss: 1.3155
i: 78,	target: -97.3080,	prediction: 110.3277,	loss: 2.1338
i: 79,	target: 240.1220,	prediction: 38.9683,	loss: 0.8377
i: 80,	target: -109.7840,	prediction: -21.4428,	loss: 0.8047
i: 81,	target: -71.6600,	prediction: 44.0538,	loss: 1.6148
i: 82,	target: -51.8250,	prediction: -17.0932,	loss: 0.6702
i: 83,	target: -79.7730,	prediction: 5.0329,	loss: 1.0631
i: 84,	target: 70.7070,	prediction: 82.2537,	loss: 0.1633
i: 85,	target: -54.6610,	prediction: 16.5134,	loss: 1.3021
i: 86,	target: -108.0930,	prediction: 4.4985,	loss: 1.0416
i: 87,	target: -102.0620,	prediction: 118.9261,	loss: 2.1652
i: 88,	target: -55.7220,	prediction: 165.8199,	loss: 3.9758
i: 89,	target: -33.9650,	prediction: 92.1826,	loss: 3.7140
i: 90,	target: 192.2680,	prediction: 49.8242,	loss: 0.7409
i: 91,	target: -58.7640,	prediction: -74.4709,	loss: 0.2673
i: 92,	target: -8.6210,	prediction: 73.1503,	loss: 9.4851
i: 93,	target: -58.1580,	prediction: -19.7504,	loss: 0.6604
i: 94,	target: -81.7630,	prediction: -39.5481,	loss: 0.5163
i: 95,	target: -79.5420,	prediction: 5.8288,	loss: 1.0733
i: 96,	target: 123.9630,	prediction: 187.9067,	loss: 0.5158
i: 97,	target: 291.0160,	prediction: 34.8795,	loss: 0.8801
i: 98,	target: 154.1550,	prediction: 50.3167,	loss: 0.6736
i: 99,	target: 160.9030,	prediction: 88.9291,	loss: 0.4473
i: 100,	target: -76.4660,	prediction: -14.1782,	loss: 0.8146
i: 101,	target: -62.6890,	prediction: 19.6019,	loss: 1.3127
i: 102,	target: -84.5240,	prediction: 43.7558,	loss: 1.5177
i: 103,	target: 103.5270,	prediction: 98.9683,	loss:

0.0440			
i: 104,	target: 150.0050,	prediction: 70.1625,	loss:
0.5323			
i: 105,	target: -83.2310,	prediction: -19.3990,	loss:
0.7669			
i: 106,	target: 168.3050,	prediction: 71.0430,	loss:
0.5779			
i: 107,	target: 28.4010,	prediction: 151.4385,	loss:
4.3322			
i: 108,	target: 221.0780,	prediction: -30.1152,	loss:
1.1362			
i: 109,	target: 142.6760,	prediction: 171.8628,	loss:
0.2046			
i: 110,	target: 143.5980,	prediction: 111.4562,	loss:
0.2238			
i: 111,	target: 141.2800,	prediction: 94.3344,	loss:
0.3323			
i: 112,	target: 93.6500,	prediction: -33.7807,	loss:
1.3607			
i: 113,	target: -91.6640,	prediction: 114.5240,	loss:
2.2494			
i: 114,	target: -60.8350,	prediction: 3.9238,	loss:
1.0645			
i: 115,	target: 126.3190,	prediction: 50.8885,	loss:
0.5971			
i: 116,	target: -43.6130,	prediction: 26.0748,	loss:
1.5979			
i: 117,	target: -66.0870,	prediction: -27.9253,	loss:
0.5774			
i: 118,	target: -47.8700,	prediction: 41.9264,	loss:
1.8758			
i: 119,	target: 88.4400,	prediction: 68.5656,	loss:
0.2247			
i: 120,	target: -54.0610,	prediction: -12.8117,	loss:
0.7630			
i: 121,	target: -77.6650,	prediction: 92.9622,	loss:
2.1970			
i: 122,	target: -95.4660,	prediction: 4.2918,	loss:
1.0450			
i: 123,	target: 150.9820,	prediction: 147.2658,	loss:
0.0246			
i: 124,	target: 44.1680,	prediction: 28.1607,	loss:
0.3624			
i: 125,	target: -28.9880,	prediction: 119.4612,	loss:
5.1211			
i: 126,	target: 115.7050,	prediction: 54.0374,	loss:
0.5330			
i: 127,	target: -68.6010,	prediction: 30.7423,	loss:



1.4481			
i: 128,	target: 163.0990,	prediction: 33.8369,	loss:
0.7925			
i: 129,	target: -72.3940,	prediction: 50.1529,	loss:
1.6928			
i: 130,	target: -81.1460,	prediction: -0.5633,	loss:
0.9931			
i: 131,	target: -30.8630,	prediction: 154.8297,	loss:
6.0167			
i: 132,	target: -78.9230,	prediction: 61.7064,	loss:
1.7819			
i: 133,	target: -37.0790,	prediction: -25.7217,	loss:
0.3063			
i: 134,	target: 126.5710,	prediction: 83.2742,	loss:
0.3421			
i: 135,	target: 206.2670,	prediction: 58.4241,	loss:
0.7168			
i: 136,	target: 117.9320,	prediction: 46.7185,	loss:
0.6039			
i: 137,	target: 66.4010,	prediction: 36.7777,	loss:
0.4461			
i: 138,	target: -73.9080,	prediction: 28.2995,	loss:
1.3829			
i: 139,	target: -23.9260,	prediction: 44.1812,	loss:
2.8466			
i: 140,	target: -41.8010,	prediction: 78.4691,	loss:
2.8772			
i: 141,	target: 6.8990,	prediction: 53.2330,	loss:
6.7160			
i: 142,	target: 167.0870,	prediction: 93.7116,	loss:
0.4391			
i: 143,	target: -33.9880,	prediction: 129.2662,	loss:
4.8033			
i: 144,	target: 191.8150,	prediction: 60.2090,	loss:
0.6861			
i: 145,	target: 17.1190,	prediction: 149.6267,	loss:
7.7404			
i: 146,	target: 100.0790,	prediction: 82.4886,	loss:
0.1758			
i: 147,	target: 160.9510,	prediction: 106.1869,	loss:
0.3403			
i: 148,	target: -59.0700,	prediction: 78.3337,	loss:
2.3261			
i: 149,	target: -33.1680,	prediction: 125.2063,	loss:
4.7749			
i: 150,	target: -97.9280,	prediction: -50.4824,	loss:
0.4845			
i: 151,	target: 193.4270,	prediction: 125.6503,	loss:

0.3504			
i: 152,	target: 147.6030,	prediction: 97.7974,	loss:
0.3374			
i: 153,	target: -84.9350,	prediction: 49.6789,	loss:
1.5849			
i: 154,	target: -64.9490,	prediction: 24.0772,	loss:
1.3707			
i: 155,	target: 85.2240,	prediction: 94.5301,	loss:
0.1092			
i: 156,	target: -31.9430,	prediction: 65.6988,	loss:
3.0568			
i: 157,	target: -48.4450,	prediction: 129.3790,	loss:
3.6706			
i: 158,	target: 57.6180,	prediction: 70.3212,	loss:
0.2205			
i: 159,	target: 190.6340,	prediction: -0.9311,	loss:
1.0049			
i: 160,	target: -76.4770,	prediction: 41.7517,	loss:
1.5459			
i: 161,	target: 112.7110,	prediction: 120.3065,	loss:
0.0674			
i: 162,	target: -68.0370,	prediction: 45.2083,	loss:
1.6645			
i: 163,	target: -112.9810,	prediction: 6.4975,	loss:
1.0575			
i: 164,	target: -100.2880,	prediction: 35.7868,	loss:
1.3568			
i: 165,	target: -77.9930,	prediction: 42.0984,	loss:
1.5398			
i: 166,	target: 147.2810,	prediction: 136.9853,	loss:
0.0699			
i: 167,	target: 196.4310,	prediction: 74.3401,	loss:
0.6215			
i: 168,	target: 220.9350,	prediction: 42.5684,	loss:
0.8073			
i: 169,	target: 309.2790,	prediction: 156.4474,	loss:
0.4942			
i: 170,	target: 153.1020,	prediction: 98.8243,	loss:
0.3545			
i: 171,	target: -56.6070,	prediction: 17.8285,	loss:
1.3150			
i: 172,	target: -72.8960,	prediction: 63.5105,	loss:
1.8712			
i: 173,	target: 144.9430,	prediction: 76.9306,	loss:
0.4692			
i: 174,	target: -68.4270,	prediction: -8.5459,	loss:
0.8751			
i: 175,	target: -100.6580,	prediction: 19.7849,	loss:

1.1966			
i: 176,	target: 49.5560,	prediction: 108.9097,	loss:
1.1977			
i: 177,	target: 40.4230,	prediction: 93.6452,	loss:
1.3166			
i: 178,	target: -68.2980,	prediction: 42.9118,	loss:
1.6283			
i: 179,	target: -72.5780,	prediction: -10.6594,	loss:
0.8531			
i: 180,	target: -95.1350,	prediction: -4.7982,	loss:
0.9496			
i: 181,	target: 18.1620,	prediction: 121.5967,	loss:
5.6951			
i: 182,	target: 182.1410,	prediction: 145.7527,	loss:
0.1998			
i: 183,	target: -98.2910,	prediction: 11.2617,	loss:
1.1146			
i: 184,	target: 376.1480,	prediction: 102.0975,	loss:
0.7286			
i: 185,	target: -78.8900,	prediction: 104.4899,	loss:
2.3245			
i: 186,	target: 339.9850,	prediction: 47.3689,	loss:
0.8607			
i: 187,	target: -65.7520,	prediction: -28.8292,	loss:
0.5615			
i: 188,	target: 8.7640,	prediction: -33.5321,	loss:
4.8261			
i: 189,	target: -39.1690,	prediction: -27.6342,	loss:
0.2945			
i: 190,	target: -37.4570,	prediction: -64.0582,	loss:
0.7102			
i: 191,	target: 54.2810,	prediction: 42.5980,	loss:
0.2152			
i: 192,	target: 132.4840,	prediction: 45.0897,	loss:
0.6597			
i: 193,	target: -57.3920,	prediction: 20.9684,	loss:
1.3654			
i: 194,	target: -70.3950,	prediction: -20.6371,	loss:
0.7068			
i: 195,	target: -12.9390,	prediction: 12.6235,	loss:
1.9756			
i: 196,	target: 194.3160,	prediction: 55.5061,	loss:
0.7144			
i: 197,	target: 205.6270,	prediction: 114.9976,	loss:
0.4407			
i: 198,	target: 45.0980,	prediction: -2.4173,	loss:
1.0536			
i: 199,	target: 0.7030,	prediction: 76.5571,	loss:

107.9006			
i: 200,	target: -75.8280,	prediction: 54.1566,	loss:
1.7142			
i: 201,	target: 131.7460,	prediction: 85.0414,	loss:
0.3545			
i: 202,	target: -41.6920,	prediction: -5.9439,	loss:
0.8574			
i: 203,	target: -82.8310,	prediction: 98.0604,	loss:
2.1839			
i: 204,	target: -77.3060,	prediction: -61.6702,	loss:
0.2023			
i: 205,	target: 8.5890,	prediction: 139.1910,	loss:
15.2057			
i: 206,	target: 109.8550,	prediction: 179.0866,	loss:
0.6302			
i: 207,	target: -76.9130,	prediction: 59.7758,	loss:
1.7772			
i: 208,	target: 221.4690,	prediction: 35.5495,	loss:
0.8395			
i: 209,	target: 182.7720,	prediction: 104.0095,	loss:
0.4309			
i: 210,	target: -16.9050,	prediction: -73.2566,	loss:
3.3334			
i: 211,	target: 177.6010,	prediction: 20.1430,	loss:
0.8866			
i: 212,	target: -20.8050,	prediction: 58.4699,	loss:
3.8104			
i: 213,	target: 208.1290,	prediction: 58.7750,	loss:
0.7176			
i: 214,	target: 143.4580,	prediction: 182.9202,	loss:
0.2751			
i: 215,	target: 120.2440,	prediction: 186.7342,	loss:
0.5530			
i: 216,	target: 143.7290,	prediction: 51.8871,	loss:
0.6390			
i: 217,	target: 91.9220,	prediction: 82.4591,	loss:
0.1029			
i: 218,	target: -60.7950,	prediction: 74.4556,	loss:
2.2247			
i: 219,	target: 158.0430,	prediction: 99.4650,	loss:
0.3706			
i: 220,	target: 91.4960,	prediction: 164.0124,	loss:
0.7926			
i: 221,	target: 215.2000,	prediction: 63.2204,	loss:
0.7062			
i: 222,	target: -56.3260,	prediction: -6.2018,	loss:
0.8899			
i: 223,	target: -43.9400,	prediction: 24.9125,	loss:

1.5670			
i: 224,	target: -56.5840,	prediction: 24.7124,	loss:
1.4367			
i: 225,	target: 151.4630,	prediction: 131.6862,	loss:
0.1306			
i: 226,	target: 225.3850,	prediction: 18.6580,	loss:
0.9172			
i: 227,	target: -86.0380,	prediction: 77.3749,	loss:
1.8993			
i: 228,	target: 144.0260,	prediction: 105.4938,	loss:
0.2675			
i: 229,	target: 149.1020,	prediction: 58.3119,	loss:
0.6089			
i: 230,	target: -77.4980,	prediction: -30.7621,	loss:
0.6031			
i: 231,	target: -70.1940,	prediction: 54.5673,	loss:
1.7774			
i: 232,	target: -61.7120,	prediction: -3.7553,	loss:
0.9391			
i: 233,	target: -55.6940,	prediction: -19.4414,	loss:
0.6509			
i: 234,	target: -79.3460,	prediction: 137.5038,	loss:
2.7330			
i: 235,	target: 142.9850,	prediction: 54.2352,	loss:
0.6207			
i: 236,	target: 189.2040,	prediction: 67.3651,	loss:
0.6440			
i: 237,	target: -44.5920,	prediction: -28.4822,	loss:
0.3613			
i: 238,	target: -72.6840,	prediction: -58.3412,	loss:
0.1973			
i: 239,	target: -25.3800,	prediction: 42.9281,	loss:
2.6914			
i: 240,	target: 21.4800,	prediction: 10.6159,	loss:
0.5058			
i: 241,	target: -12.4440,	prediction: 6.6042,	loss:
1.5307			
i: 242,	target: 41.6180,	prediction: 93.0629,	loss:
1.2361			
i: 243,	target: -36.2620,	prediction: 40.4197,	loss:
2.1147			
i: 244,	target: 387.4510,	prediction: 78.3062,	loss:
0.7979			
i: 245,	target: -59.3190,	prediction: 110.4200,	loss:
2.8615			
i: 246,	target: -53.7850,	prediction: -17.9585,	loss:
0.6661			
i: 247,	target: -83.1650,	prediction: -13.4928,	loss:

0.8378			
i: 248,	target: 221.2750,	prediction: 37.7346,	loss:
0.8295			
i: 249,	target: 247.6790,	prediction: 51.1080,	loss:
0.7937			
i: 250,	target: 80.8140,	prediction: 100.0230,	loss:
0.2377			
i: 251,	target: 190.0410,	prediction: 0.5715,	loss:
0.9970			
i: 252,	target: 276.1010,	prediction: 125.0597,	loss:
0.5471			
i: 253,	target: -64.3480,	prediction: 14.1137,	loss:
1.2193			
i: 254,	target: -40.1590,	prediction: -8.0074,	loss:
0.8006			
i: 255,	target: 430.1470,	prediction: -6.5284,	loss:
1.0152			
i: 256,	target: -65.3650,	prediction: 56.8216,	loss:
1.8693			
i: 257,	target: 106.2190,	prediction: 79.7544,	loss:
0.2492			
i: 258,	target: -22.8860,	prediction: 20.9467,	loss:
1.9153			
i: 259,	target: 48.5210,	prediction: -33.0987,	loss:
1.6822			
i: 260,	target: -46.6710,	prediction: 83.4411,	loss:
2.7879			
i: 261,	target: 230.3930,	prediction: 36.3332,	loss:
0.8423			
i: 262,	target: -62.8560,	prediction: 75.6140,	loss:
2.2030			
i: 263,	target: -31.7640,	prediction: 37.0932,	loss:
2.1678			
i: 264,	target: 245.5800,	prediction: 58.0476,	loss:
0.7636			
i: 265,	target: 93.2830,	prediction: 44.5253,	loss:
0.5227			
i: 266,	target: -13.2330,	prediction: -3.6203,	loss:
0.7264			
i: 267,	target: -72.4840,	prediction: -31.7405,	loss:
0.5621			
i: 268,	target: 239.6430,	prediction: 11.8425,	loss:
0.9506			
i: 269,	target: 119.0500,	prediction: 32.5008,	loss:
0.7270			
i: 270,	target: 145.6180,	prediction: 86.4900,	loss:
0.4060			
i: 271,	target: 94.4410,	prediction: 56.8622,	loss:

0.3979			
i: 272,	target: -59.6330,	prediction: -5.1620,	loss:
0.9134			
i: 273,	target: 182.7130,	prediction: 178.1967,	loss:
0.0247			
i: 274,	target: -66.9660,	prediction: 8.4858,	loss:
1.1267			
i: 275,	target: -80.6790,	prediction: -30.1028,	loss:
0.6269			
i: 276,	target: -63.7580,	prediction: 28.7741,	loss:
1.4513			
i: 277,	target: 7.5890,	prediction: 21.1585,	loss:
1.7881			
i: 278,	target: -80.8490,	prediction: -10.1228,	loss:
0.8748			
i: 279,	target: -48.4360,	prediction: 12.5662,	loss:
1.2594			
i: 280,	target: 38.2230,	prediction: 120.3259,	loss:
2.1480			
i: 281,	target: 8.4480,	prediction: 86.1626,	loss:
9.1992			
i: 282,	target: -83.7960,	prediction: 39.6452,	loss:
1.4731			
i: 283,	target: -38.1940,	prediction: 72.3957,	loss:
2.8955			
i: 284,	target: 84.4170,	prediction: 108.9299,	loss:
0.2904			
i: 285,	target: -75.6920,	prediction: -26.4273,	loss:
0.6509			
i: 286,	target: 217.9570,	prediction: 103.1813,	loss:
0.5266			
i: 287,	target: 96.9670,	prediction: 125.5860,	loss:
0.2951			
i: 288,	target: -65.1390,	prediction: -41.6239,	loss:
0.3610			
i: 289,	target: 174.9610,	prediction: 103.3215,	loss:
0.4095			
i: 290,	target: -35.6640,	prediction: -65.3236,	loss:
0.8316			
i: 291,	target: -85.7980,	prediction: 22.6938,	loss:
1.2645			
i: 292,	target: -73.6190,	prediction: 4.4421,	loss:
1.0603			
i: 293,	target: 124.0640,	prediction: 38.1078,	loss:
0.6928			
i: 294,	target: -41.2360,	prediction: 67.5106,	loss:
2.6372			
i: 295,	target: 149.8000,	prediction: 8.9160,	loss:

0.9405			
i: 296,	target: -86.3120,	prediction: 31.8549,	loss:
1.3691			
i: 297,	target: 82.2850,	prediction: 108.8510,	loss:
0.3229			
i: 298,	target: -72.2080,	prediction: 62.5621,	loss:
1.8664			
i: 299,	target: -100.8450,	prediction: 5.1663,	loss:
1.0512			
i: 300,	target: -49.2800,	prediction: 80.7610,	loss:
2.6388			
i: 301,	target: 422.8040,	prediction: 106.8534,	loss:
0.7473			
i: 302,	target: 48.2340,	prediction: 37.1075,	loss:
0.2307			
i: 303,	target: -51.2110,	prediction: -22.7901,	loss:
0.5550			
i: 304,	target: 104.4040,	prediction: -2.2834,	loss:
1.0219			
i: 305,	target: 218.4770,	prediction: 47.8607,	loss:
0.7809			
i: 306,	target: 112.1520,	prediction: 102.2061,	loss:
0.0887			
i: 307,	target: 209.2620,	prediction: -21.5297,	loss:
1.1029			
i: 308,	target: -54.1740,	prediction: 130.7755,	loss:
3.4140			
i: 309,	target: 24.9200,	prediction: 89.3316,	loss:
2.5847			
i: 310,	target: 462.5230,	prediction: 104.9735,	loss:
0.7730			
i: 311,	target: -103.0490,	prediction: 64.8279,	loss:
1.6291			
i: 312,	target: -76.7900,	prediction: 39.3112,	loss:
1.5119			
i: 313,	target: -100.1440,	prediction: 33.5401,	loss:
1.3349			
i: 314,	target: 103.4120,	prediction: 44.5959,	loss:
0.5688			
i: 315,	target: 66.6820,	prediction: 83.9910,	loss:
0.2596			
i: 316,	target: -46.6900,	prediction: 55.3461,	loss:
2.1854			
i: 317,	target: 432.3910,	prediction: 96.4967,	loss:
0.7768			
i: 318,	target: 124.9920,	prediction: 188.3101,	loss:
0.5066			
i: 319,	target: -71.6510,	prediction: -3.9122,	loss:



0.9454			
i: 320,	target: 98.2160,	prediction: 38.4187,	loss:
0.6088			
i: 321,	target: 190.2090,	prediction: 103.9343,	loss:
0.4536			
i: 322,	target: -57.5860,	prediction: 70.9363,	loss:
2.2318			
i: 323,	target: 46.7510,	prediction: 102.2005,	loss:
1.1861			
i: 324,	target: -49.9130,	prediction: 11.6978,	loss:
1.2344			
i: 325,	target: -84.3410,	prediction: 10.3774,	loss:
1.1230			
i: 326,	target: -34.7210,	prediction: 72.3524,	loss:
3.0838			
i: 327,	target: 176.5490,	prediction: 74.9480,	loss:
0.5755			
i: 328,	target: 199.0640,	prediction: 117.5122,	loss:
0.4097			
i: 329,	target: 115.4030,	prediction: 101.7749,	loss:
0.1181			
i: 330,	target: -53.6870,	prediction: 7.4956,	loss:
1.1396			
i: 331,	target: -71.4310,	prediction: 4.7190,	loss:
1.0661			
i: 332,	target: 125.5050,	prediction: 45.5383,	loss:
0.6372			
i: 333,	target: -99.3920,	prediction: -20.0909,	loss:
0.7979			
i: 334,	target: 91.1090,	prediction: 75.8042,	loss:
0.1680			
i: 335,	target: 179.3980,	prediction: 127.1306,	loss:
0.2913			
i: 336,	target: -41.2870,	prediction: 33.6289,	loss:
1.8145			
i: 337,	target: 46.3030,	prediction: 11.2675,	loss:
0.7567			
i: 338,	target: 113.9330,	prediction: 91.5758,	loss:
0.1962			
i: 339,	target: 230.8920,	prediction: 64.4248,	loss:
0.7210			
i: 340,	target: -92.6800,	prediction: 11.1253,	loss:
1.1200			
i: 341,	target: -51.7080,	prediction: 80.7577,	loss:
2.5618			
i: 342,	target: -76.1880,	prediction: -20.4198,	loss:
0.7320			
i: 343,	target: -107.3090,	prediction: 21.8671,	loss:

1.2038			
i: 344,	target: -41.5360,	prediction: -30.8887,	loss:
0.2563			
i: 345,	target: 153.2570,	prediction: 155.5945,	loss:
0.0153			
i: 346,	target: 134.4870,	prediction: 46.9126,	loss:
0.6512			
i: 347,	target: -80.1440,	prediction: 99.6166,	loss:
2.2430			
i: 348,	target: -48.8910,	prediction: 26.3134,	loss:
1.5382			
i: 349,	target: 182.0120,	prediction: 14.7291,	loss:
0.9191			
i: 350,	target: 210.1540,	prediction: 51.1863,	loss:
0.7564			
i: 351,	target: -32.3820,	prediction: 120.0178,	loss:
4.7063			
i: 352,	target: 201.8810,	prediction: 103.8503,	loss:
0.4856			
i: 353,	target: 10.9110,	prediction: 122.8091,	loss:
10.2555			
i: 354,	target: -73.0970,	prediction: 53.5364,	loss:
1.7324			
i: 355,	target: -64.8800,	prediction: 25.3350,	loss:
1.3905			
i: 356,	target: -103.8060,	prediction: 7.2419,	loss:
1.0698			
i: 357,	target: -16.6320,	prediction: 146.0719,	loss:
9.7826			
i: 358,	target: 73.7890,	prediction: 124.1311,	loss:
0.6822			
i: 359,	target: -55.8740,	prediction: 28.9048,	loss:
1.5173			
i: 360,	target: -78.5910,	prediction: 41.5029,	loss:
1.5281			
i: 361,	target: -48.7520,	prediction: 54.0831,	loss:
2.1094			
i: 362,	target: 91.8910,	prediction: -4.1731,	loss:
1.0454			
i: 363,	target: -79.1450,	prediction: -29.4100,	loss:
0.6284			
i: 364,	target: -35.1370,	prediction: 27.2226,	loss:
1.7748			
i: 365,	target: 253.1070,	prediction: 36.5306,	loss:
0.8557			
i: 366,	target: 144.3610,	prediction: 117.3301,	loss:
0.1872			
i: 367,	target: -74.4630,	prediction: 56.6326,	loss:

1.7605			
i: 368,	target: 62.0560,	prediction: 50.3690,	loss:
0.1883			
i: 369,	target: 219.4170,	prediction: 101.6806,	loss:
0.5366			
i: 370,	target: -45.5860,	prediction: 51.6965,	loss:
2.1340			
i: 371,	target: -41.0360,	prediction: 8.0938,	loss:
1.1972			
i: 372,	target: -68.2450,	prediction: -52.2510,	loss:
0.2344			
i: 373,	target: -66.8730,	prediction: 60.9799,	loss:
1.9119			
i: 374,	target: -23.9090,	prediction: 31.9907,	loss:
2.3380			
i: 375,	target: 345.4230,	prediction: 96.9046,	loss:
0.7195			
i: 376,	target: 190.2660,	prediction: 58.7404,	loss:
0.6913			
i: 377,	target: -52.7170,	prediction: -0.7087,	loss:
0.9866			
i: 378,	target: -87.5290,	prediction: 40.8991,	loss:
1.4673			
i: 379,	target: -90.2810,	prediction: 16.0886,	loss:
1.1782			
i: 380,	target: -72.8340,	prediction: -49.6456,	loss:
0.3184			
i: 381,	target: 212.5180,	prediction: 146.0797,	loss:
0.3126			
i: 382,	target: -72.5260,	prediction: -25.3272,	loss:
0.6508			
i: 383,	target: -70.0790,	prediction: 4.3772,	loss:
1.0625			
i: 384,	target: -86.3140,	prediction: -31.6010,	loss:
0.6339			
i: 385,	target: 214.6510,	prediction: 46.9494,	loss:
0.7813			
i: 386,	target: 14.1460,	prediction: 73.1420,	loss:
4.1705			
i: 387,	target: -53.8240,	prediction: -2.7186,	loss:
0.9495			
i: 388,	target: 173.0400,	prediction: 83.7481,	loss:
0.5160			
i: 389,	target: 136.4440,	prediction: 145.5770,	loss:
0.0669			
i: 390,	target: -10.4280,	prediction: 0.8705,	loss:
1.0835			
i: 391,	target: 188.1020,	prediction: 120.8426,	loss:

0.3576			
i: 392,	target: -58.5850,	prediction: 9.7403,	loss:
1.1663			
i: 393,	target: 22.1340,	prediction: 108.6361,	loss:
3.9081			
i: 394,	target: 0.2740,	prediction: 28.8874,	loss:
104.4285			
i: 395,	target: -71.1370,	prediction: -15.4980,	loss:
0.7821			
i: 396,	target: 60.0450,	prediction: -4.2230,	loss:
1.0703			
i: 397,	target: 207.0410,	prediction: 124.8831,	loss:
0.3968			
i: 398,	target: -77.6760,	prediction: 64.7334,	loss:
1.8334			
i: 399,	target: 129.9730,	prediction: 103.2188,	loss:
0.2058			
i: 400,	target: 218.6340,	prediction: -27.2540,	loss:
1.1247			
i: 401,	target: -103.1240,	prediction: -4.3429,	loss:
0.9579			
i: 402,	target: -45.4760,	prediction: 63.4931,	loss:
2.3962			
i: 403,	target: 121.5870,	prediction: 110.4927,	loss:
0.0912			
i: 404,	target: 82.3260,	prediction: 100.7901,	loss:
0.2243			
i: 405,	target: 177.8440,	prediction: 136.7910,	loss:
0.2308			
i: 406,	target: 130.1850,	prediction: 139.8587,	loss:
0.0743			
i: 407,	target: 14.2030,	prediction: 32.4565,	loss:
1.2852			
i: 408,	target: -37.3100,	prediction: 108.9157,	loss:
3.9192			
i: 409,	target: -66.4770,	prediction: -20.3883,	loss:
0.6933			
i: 410,	target: -43.6060,	prediction: 54.0526,	loss:
2.2396			
i: 411,	target: 94.8230,	prediction: 86.8179,	loss:
0.0844			
i: 412,	target: -80.4090,	prediction: 99.9860,	loss:
2.2435			
i: 413,	target: 208.0660,	prediction: 78.4896,	loss:
0.6228			
i: 414,	target: 75.4330,	prediction: 86.0581,	loss:
0.1409			
i: 415,	target: -73.6560,	prediction: 76.7651,	loss:

2.0422			
i: 416,	target: -75.5850,	prediction: -7.0638,	loss:
0.9065			
i: 417,	target: -72.2780,	prediction: -38.7933,	loss:
0.4633			
i: 418,	target: -52.6650,	prediction: 9.7147,	loss:
1.1845			
i: 419,	target: 203.9810,	prediction: 2.1596,	loss:
0.9894			
i: 420,	target: -60.7040,	prediction: 53.2431,	loss:
1.8771			
i: 421,	target: -73.0490,	prediction: -3.6257,	loss:
0.9504			
i: 422,	target: 104.2270,	prediction: 69.6467,	loss:
0.3318			
i: 423,	target: -67.4110,	prediction: 12.9475,	loss:
1.1921			
i: 424,	target: 26.8800,	prediction: 11.8883,	loss:
0.5577			
i: 425,	target: -73.4310,	prediction: 15.4796,	loss:
1.2108			
i: 426,	target: -93.0970,	prediction: 35.2233,	loss:
1.3784			
i: 427,	target: 111.3770,	prediction: 107.8639,	loss:
0.0315			
i: 428,	target: 133.4730,	prediction: 75.0820,	loss:
0.4375			
i: 429,	target: -69.7720,	prediction: 63.8364,	loss:
1.9149			
i: 430,	target: -79.9150,	prediction: 28.1190,	loss:
1.3519			
i: 431,	target: 107.0780,	prediction: 94.1602,	loss:
0.1206			
i: 432,	target: -71.7930,	prediction: 132.0450,	loss:
2.8392			
i: 433,	target: -24.4250,	prediction: 154.3710,	loss:
7.3202			
i: 434,	target: 35.4880,	prediction: -65.1940,	loss:
2.8371			
i: 435,	target: -76.2760,	prediction: 28.8294,	loss:
1.3780			
i: 436,	target: 79.2510,	prediction: 35.7843,	loss:
0.5485			
i: 437,	target: -42.2410,	prediction: 14.8823,	loss:
1.3523			
i: 438,	target: -61.5070,	prediction: -31.8776,	loss:
0.4817			
i: 439,	target: -94.9420,	prediction: -45.7978,	loss:

0.5176			
i: 440,	target: -56.0330,	prediction: -48.8852,	loss:
0.1276			
i: 441,	target: 304.5930,	prediction: 136.7676,	loss:
0.5510			
i: 442,	target: 69.7840,	prediction: 6.6699,	loss:
0.9044			
i: 443,	target: 193.2920,	prediction: 9.9321,	loss:
0.9486			
i: 444,	target: -72.7110,	prediction: 70.4054,	loss:
1.9683			
i: 445,	target: -76.9900,	prediction: 18.0191,	loss:
1.2340			
i: 446,	target: -23.8230,	prediction: -37.7770,	loss:
0.5857			
i: 447,	target: -55.6700,	prediction: -22.8857,	loss:
0.5889			
i: 448,	target: -57.4820,	prediction: -43.5423,	loss:
0.2425			
i: 449,	target: -51.2740,	prediction: -11.6127,	loss:
0.7735			
i: 450,	target: -60.9020,	prediction: 56.2678,	loss:
1.9239			
i: 451,	target: -79.2220,	prediction: -17.7052,	loss:
0.7765			
i: 452,	target: -90.3440,	prediction: 50.4164,	loss:
1.5580			
i: 453,	target: -63.7830,	prediction: -59.0024,	loss:
0.0750			
i: 454,	target: -65.2620,	prediction: -31.9035,	loss:
0.5111			
i: 455,	target: -28.4770,	prediction: 29.4217,	loss:
2.0332			
i: 456,	target: 82.6320,	prediction: -11.9602,	loss:
1.1447			
i: 457,	target: -68.7130,	prediction: 63.2943,	loss:
1.9211			
i: 458,	target: -84.8740,	prediction: 56.9836,	loss:
1.6714			
i: 459,	target: 23.7200,	prediction: 91.0339,	loss:
2.8379			
i: 460,	target: 2.8870,	prediction: 7.3772,	loss:
1.5553			
i: 461,	target: -51.3620,	prediction: 16.6438,	loss:
1.3240			
i: 462,	target: 118.5730,	prediction: 109.5070,	loss:
0.0765			
i: 463,	target: -79.9120,	prediction: 107.8716,	loss:

2.3499			
i: 464,	target: -54.2040,	prediction: 3.6595,	loss:
1.0675			
i: 465,	target: 109.6410,	prediction: 75.3458,	loss:
0.3128			
i: 466,	target: 231.5590,	prediction: 12.7115,	loss:
0.9451			
i: 467,	target: -87.2590,	prediction: 61.5980,	loss:
1.7059			
i: 468,	target: 14.6160,	prediction: 63.7064,	loss:
3.3587			
i: 469,	target: -114.1410,	prediction: 47.7282,	loss:
1.4182			
i: 470,	target: -52.1950,	prediction: 51.3788,	loss:
1.9844			
i: 471,	target: -38.6830,	prediction: 15.4835,	loss:
1.4003			
i: 472,	target: -58.6630,	prediction: 54.3189,	loss:
1.9259			
i: 473,	target: -55.3700,	prediction: -4.7536,	loss:
0.9141			
i: 474,	target: 102.4800,	prediction: 173.1888,	loss:
0.6900			
i: 475,	target: 83.0280,	prediction: 43.1902,	loss:
0.4798			
i: 476,	target: 176.9250,	prediction: 115.0952,	loss:
0.3495			
i: 477,	target: -43.1440,	prediction: 68.7687,	loss:
2.5939			
i: 478,	target: 208.4940,	prediction: 55.6525,	loss:
0.7331			
i: 479,	target: 222.7900,	prediction: 22.0147,	loss:
0.9012			
i: 480,	target: -55.3130,	prediction: -15.7175,	loss:
0.7158			
i: 481,	target: 39.3780,	prediction: 37.4733,	loss:
0.0484			
i: 482,	target: -58.3820,	prediction: 9.8699,	loss:
1.1691			
i: 483,	target: 137.3830,	prediction: 69.4890,	loss:
0.4942			
i: 484,	target: -59.7180,	prediction: 19.4162,	loss:
1.3251			
i: 485,	target: 180.1440,	prediction: 35.5299,	loss:
0.8028			
i: 486,	target: 119.7780,	prediction: 142.8410,	loss:
0.1925			
i: 487,	target: 192.5920,	prediction: 81.3450,	loss:

0.5776			
i: 488,	target: 164.4760,	prediction: -19.9242,	loss:
1.1211			
i: 489,	target: -50.1880,	prediction: 115.9129,	loss:
3.3096			
i: 490,	target: 147.0140,	prediction: 132.2941,	loss:
0.1001			
i: 491,	target: -98.1630,	prediction: 35.3612,	loss:
1.3602			
i: 492,	target: 189.0640,	prediction: 98.0981,	loss:
0.4811			
i: 493,	target: 193.4560,	prediction: -33.8998,	loss:
1.1752			
i: 494,	target: 108.1120,	prediction: 111.4658,	loss:
0.0310			
i: 495,	target: -52.2920,	prediction: 38.8604,	loss:
1.7431			
i: 496,	target: -43.0210,	prediction: 47.1005,	loss:
2.0948			
i: 497,	target: -110.5020,	prediction: 58.0792,	loss:
1.5256			
i: 498,	target: -65.6320,	prediction: 68.0212,	loss:
2.0364			
i: 499,	target: -81.4380,	prediction: 56.1912,	loss:
1.6900			
i: 500,	target: -72.1720,	prediction: 127.0559,	loss:
2.7605			
i: 501,	target: 354.0360,	prediction: 59.8176,	loss:
0.8310			
i: 502,	target: 303.4470,	prediction: 70.7267,	loss:
0.7669			
i: 503,	target: -71.0320,	prediction: 76.1736,	loss:
2.0724			
i: 504,	target: -92.9330,	prediction: 50.0632,	loss:
1.5387			
i: 505,	target: -109.0180,	prediction: 40.7630,	loss:
1.3739			
i: 506,	target: -29.2260,	prediction: -12.5664,	loss:
0.5700			
i: 507,	target: -72.3010,	prediction: 20.9508,	loss:
1.2898			
i: 508,	target: -64.6980,	prediction: 93.7462,	loss:
2.4490			
i: 509,	target: -21.9620,	prediction: 85.9968,	loss:
4.9157			
i: 510,	target: 28.2890,	prediction: -19.3277,	loss:
1.6832			
i: 511,	target: -77.6670,	prediction: -18.0615,	loss:



0.7674			
i: 512,	target: -44.3460,	prediction: -14.0970,	loss:
0.6821			
i: 513,	target: 191.4360,	prediction: 99.7291,	loss:
0.4790			
i: 514,	target: 157.9800,	prediction: 48.8906,	loss:
0.6905			
i: 515,	target: -75.3000,	prediction: 74.9134,	loss:
1.9949			
i: 516,	target: 147.1480,	prediction: 104.5403,	loss:
0.2896			
i: 517,	target: -43.6130,	prediction: 88.5444,	loss:
3.0302			
i: 518,	target: -76.3660,	prediction: 51.0000,	loss:
1.6678			
i: 519,	target: -65.8930,	prediction: 49.6444,	loss:
1.7534			
i: 520,	target: 36.0250,	prediction: 12.7161,	loss:
0.6470			
i: 521,	target: -86.5200,	prediction: 100.2898,	loss:
2.1592			
i: 522,	target: -28.3900,	prediction: 5.0774,	loss:
1.1788			
i: 523,	target: -17.8000,	prediction: -2.1795,	loss:
0.8776			
i: 524,	target: -67.9520,	prediction: 98.1435,	loss:
2.4443			
i: 525,	target: 46.9790,	prediction: 37.4790,	loss:
0.2022			
i: 526,	target: 142.1650,	prediction: 96.4522,	loss:
0.3215			
i: 527,	target: 59.8680,	prediction: 68.0586,	loss:
0.1368			
i: 528,	target: -58.1990,	prediction: 37.8119,	loss:
1.6497			
i: 529,	target: 109.3270,	prediction: 123.1467,	loss:
0.1264			
i: 530,	target: -74.6420,	prediction: 37.4802,	loss:
1.5021			
i: 531,	target: 167.3540,	prediction: 139.1840,	loss:
0.1683			
i: 532,	target: -81.4640,	prediction: 20.3344,	loss:
1.2496			
i: 533,	target: -83.8230,	prediction: 59.5148,	loss:
1.7100			
i: 534,	target: -50.6790,	prediction: 5.6277,	loss:
1.1110			
i: 535,	target: -79.3280,	prediction: 9.6143,	loss:

1.1212			
i: 536,	target: -52.3680,	prediction: 27.6840,	loss:
1.5286			
i: 537,	target: -88.3730,	prediction: -46.7132,	loss:
0.4714			
i: 538,	target: -35.0000,	prediction: 53.3277,	loss:
2.5236			
i: 539,	target: 49.3610,	prediction: -16.4072,	loss:
1.3324			
i: 540,	target: 64.4680,	prediction: 65.9899,	loss:
0.0236			
i: 541,	target: -52.5910,	prediction: 45.3644,	loss:
1.8626			
i: 542,	target: 137.7260,	prediction: 0.4775,	loss:
0.9965			
i: 543,	target: 238.7970,	prediction: 11.1128,	loss:
0.9535			
i: 544,	target: -72.3730,	prediction: 39.3712,	loss:
1.5440			
i: 545,	target: -69.8770,	prediction: 7.3324,	loss:
1.1049			
i: 546,	target: 140.0050,	prediction: 56.9962,	loss:
0.5929			
i: 547,	target: 2.3570,	prediction: 34.9129,	loss:
13.8125			
i: 548,	target: -32.5490,	prediction: 98.7871,	loss:
4.0350			
i: 549,	target: -37.4460,	prediction: 10.0688,	loss:
1.2689			
i: 550,	target: 135.8270,	prediction: 99.4347,	loss:
0.2679			
i: 551,	target: 113.6900,	prediction: 91.7095,	loss:
0.1933			
i: 552,	target: 128.0010,	prediction: 95.1176,	loss:
0.2569			
i: 553,	target: 36.1350,	prediction: -24.5556,	loss:
1.6796			
i: 554,	target: -52.9150,	prediction: 83.5721,	loss:
2.5794			
i: 555,	target: -81.7550,	prediction: 82.5802,	loss:
2.0101			
i: 556,	target: -81.5190,	prediction: 6.0684,	loss:
1.0744			
i: 557,	target: -65.5200,	prediction: 29.1879,	loss:
1.4455			
i: 558,	target: -74.5360,	prediction: -54.2253,	loss:
0.2725			
i: 559,	target: -65.0120,	prediction: 40.0274,	loss:

1.6157			
i: 560,	target: -13.8370,	prediction: 130.5199,	loss:
10.4327			
i: 561,	target: -62.1180,	prediction: 26.9635,	loss:
1.4341			
i: 562,	target: -76.7450,	prediction: 50.2002,	loss:
1.6541			
i: 563,	target: -57.5680,	prediction: 32.4680,	loss:
1.5640			
i: 564,	target: -45.0180,	prediction: 65.8822,	loss:
2.4635			
i: 565,	target: 270.2010,	prediction: 35.5394,	loss:
0.8685			
i: 566,	target: 146.9260,	prediction: 88.9855,	loss:
0.3944			
i: 567,	target: 170.2960,	prediction: 108.3900,	loss:
0.3635			
i: 568,	target: -72.6130,	prediction: 39.6856,	loss:
1.5465			
i: 569,	target: -75.1970,	prediction: -23.9275,	loss:
0.6818			
i: 570,	target: -40.6320,	prediction: -61.1216,	loss:
0.5043			
i: 571,	target: -71.6350,	prediction: -44.6542,	loss:
0.3766			
i: 572,	target: 4.9810,	prediction: 78.4014,	loss:
14.7401			
i: 573,	target: 220.0580,	prediction: 68.3136,	loss:
0.6896			
i: 574,	target: -67.1580,	prediction: 27.2972,	loss:
1.4065			
i: 575,	target: -57.4530,	prediction: 6.3742,	loss:
1.1109			
i: 576,	target: -78.0700,	prediction: 130.6926,	loss:
2.6740			
i: 577,	target: -56.0340,	prediction: 46.6603,	loss:
1.8327			
i: 578,	target: -51.6610,	prediction: 77.9356,	loss:
2.5086			
i: 579,	target: 110.2090,	prediction: 26.2501,	loss:
0.7618			
i: 580,	target: 94.9510,	prediction: 77.6198,	loss:
0.1825			
i: 581,	target: -77.1540,	prediction: 66.5530,	loss:
1.8626			
i: 582,	target: 198.7740,	prediction: 110.7056,	loss:
0.4431			
i: 583,	target: 185.0520,	prediction: 112.6321,	loss:

0.3913			
i: 584,	target: -62.7040,	prediction: 42.6645,	loss:
1.6804			
i: 585,	target: -63.1570,	prediction: -2.2593,	loss:
0.9642			
i: 586,	target: 34.8410,	prediction: 16.3537,	loss:
0.5306			
i: 587,	target: 354.6880,	prediction: 160.6485,	loss:
0.5471			
i: 588,	target: 192.7810,	prediction: 63.8568,	loss:
0.6688			
i: 589,	target: -38.1080,	prediction: 43.4330,	loss:
2.1397			
i: 590,	target: -93.1370,	prediction: 53.6002,	loss:
1.5755			
i: 591,	target: 77.3340,	prediction: 80.2494,	loss:
0.0377			
i: 592,	target: -64.7830,	prediction: 23.2711,	loss:
1.3592			
i: 593,	target: 146.3010,	prediction: 108.1273,	loss:
0.2609			
i: 594,	target: -31.9420,	prediction: -0.3769,	loss:
0.9882			
i: 595,	target: -76.5330,	prediction: 28.0642,	loss:
1.3667			
i: 596,	target: -41.1510,	prediction: -6.5270,	loss:
0.8414			
i: 597,	target: 87.5190,	prediction: 52.0432,	loss:
0.4053			
i: 598,	target: -50.5130,	prediction: 16.5723,	loss:
1.3281			
i: 599,	target: -37.1100,	prediction: 73.4169,	loss:
2.9784			
i: 600,	target: -47.6250,	prediction: 66.0677,	loss:
2.3872			
i: 601,	target: 27.1830,	prediction: 79.9023,	loss:
1.9394			
i: 602,	target: -67.7240,	prediction: -72.4873,	loss:
0.0703			
i: 603,	target: -58.1990,	prediction: 73.5612,	loss:
2.2640			
i: 604,	target: 191.8100,	prediction: 27.7371,	loss:
0.8554			
i: 605,	target: 204.5740,	prediction: 71.2620,	loss:
0.6517			
i: 606,	target: -15.6430,	prediction: 3.6952,	loss:
1.2362			
i: 607,	target: 304.9640,	prediction: 31.3435,	loss:

0.8972			
i: 608,	target: -52.9760,	prediction: 100.5901,	loss:
2.8988			
i: 609,	target: 99.7320,	prediction: 81.5441,	loss:
0.1824			
i: 610,	target: 85.0670,	prediction: 44.6693,	loss:
0.4749			
i: 611,	target: 395.5400,	prediction: 109.1634,	loss:
0.7240			
i: 612,	target: -84.7130,	prediction: -67.5654,	loss:
0.2024			
i: 613,	target: 190.7740,	prediction: 107.3214,	loss:
0.4374			
i: 614,	target: 3.0590,	prediction: -24.2322,	loss:
8.9216			
i: 615,	target: -67.0230,	prediction: 24.1422,	loss:
1.3602			
i: 616,	target: 460.1250,	prediction: 69.2111,	loss:
0.8496			
i: 617,	target: -56.8410,	prediction: 79.5500,	loss:
2.3995			
i: 618,	target: 44.7760,	prediction: -6.7818,	loss:
1.1515			
i: 619,	target: -85.6340,	prediction: -5.4161,	loss:
0.9368			
i: 620,	target: -52.6770,	prediction: -15.6295,	loss:
0.7033			
i: 621,	target: -64.7520,	prediction: 49.9710,	loss:
1.7717			
i: 622,	target: -57.9160,	prediction: 71.8216,	loss:
2.2401			
i: 623,	target: 170.6550,	prediction: 52.4037,	loss:
0.6929			
i: 624,	target: -93.4100,	prediction: 79.3462,	loss:
1.8494			
i: 625,	target: 229.2730,	prediction: 98.0342,	loss:
0.5724			
i: 626,	target: -75.9110,	prediction: -61.4255,	loss:
0.1908			
i: 627,	target: 104.4500,	prediction: 70.2372,	loss:
0.3276			
i: 628,	target: -104.3790,	prediction: 31.7218,	loss:
1.3039			
i: 629,	target: 196.8090,	prediction: 103.2732,	loss:
0.4753			
i: 630,	target: 185.5110,	prediction: 128.3802,	loss:
0.3080			
i: 631,	target: 119.9690,	prediction: 149.6667,	loss:

0.2475			
i: 632,	target: 0.2140,	prediction: 64.0958,	loss:
298.5132			
i: 633,	target: -72.9590,	prediction: 4.1886,	loss:
1.0574			
i: 634,	target: -76.6860,	prediction: 31.0628,	loss:
1.4051			
i: 635,	target: 72.0240,	prediction: 58.3077,	loss:
0.1904			
i: 636,	target: 154.8910,	prediction: 29.6215,	loss:
0.8088			
i: 637,	target: -58.0540,	prediction: -28.9846,	loss:
0.5007			
i: 638,	target: -61.2160,	prediction: 13.7953,	loss:
1.2254			
i: 639,	target: 220.3470,	prediction: 24.7719,	loss:
0.8876			
i: 640,	target: 93.9290,	prediction: 56.1520,	loss:
0.4022			
i: 641,	target: -76.9320,	prediction: -37.1134,	loss:
0.5176			
i: 642,	target: -14.4270,	prediction: 86.7268,	loss:
7.0114			
i: 643,	target: -86.2710,	prediction: 91.3049,	loss:
2.0583			
i: 644,	target: -60.7420,	prediction: 29.8021,	loss:
1.4906			
i: 645,	target: -76.2750,	prediction: -34.6486,	loss:
0.5457			
i: 646,	target: 195.5950,	prediction: -26.4931,	loss:
1.1354			
i: 647,	target: 3.3490,	prediction: -18.7286,	loss:
6.5923			
i: 648,	target: 113.6770,	prediction: 45.7610,	loss:
0.5974			
i: 649,	target: 243.0330,	prediction: 139.9395,	loss:
0.4242			
i: 650,	target: -13.8650,	prediction: -19.7911,	loss:
0.4274			
i: 651,	target: 2.3590,	prediction: 165.7132,	loss:
69.2472			
i: 652,	target: 95.3880,	prediction: 156.2302,	loss:
0.6378			
i: 653,	target: 171.4390,	prediction: 4.5236,	loss:
0.9736			
i: 654,	target: -78.4040,	prediction: -10.0251,	loss:
0.8721			
i: 655,	target: -93.1520,	prediction: 11.2978,	loss:

1.1213			
i: 656,	target: 202.1120,	prediction: 86.6707,	loss:
0.5712			
i: 657,	target: -70.0690,	prediction: 8.9586,	loss:
1.1279			
i: 658,	target: -72.1250,	prediction: 57.0238,	loss:
1.7906			
i: 659,	target: -64.0620,	prediction: 39.0379,	loss:
1.6094			
i: 660,	target: -84.0910,	prediction: -23.5864,	loss:
0.7195			
i: 661,	target: -74.2260,	prediction: 75.0598,	loss:
2.0112			
i: 662,	target: 143.8850,	prediction: 104.6048,	loss:
0.2730			
i: 663,	target: -75.3080,	prediction: 22.7251,	loss:
1.3018			
i: 664,	target: -84.3030,	prediction: 51.9090,	loss:
1.6157			
i: 665,	target: -90.2860,	prediction: -14.2122,	loss:
0.8426			
i: 666,	target: -68.8200,	prediction: -51.8437,	loss:
0.2467			
i: 667,	target: 104.0850,	prediction: 23.2957,	loss:
0.7762			
i: 668,	target: 24.7570,	prediction: 93.2029,	loss:
2.7647			
i: 669,	target: -66.0360,	prediction: 9.9407,	loss:
1.1505			
i: 670,	target: 27.5220,	prediction: 86.0332,	loss:
2.1260			
i: 671,	target: -5.8850,	prediction: 42.3992,	loss:
8.2046			
i: 672,	target: -51.0990,	prediction: -18.8132,	loss:
0.6318			
i: 673,	target: 190.7940,	prediction: 92.0371,	loss:
0.5176			
i: 674,	target: -49.2650,	prediction: -64.8181,	loss:
0.3157			
i: 675,	target: -65.3480,	prediction: 8.2390,	loss:
1.1261			
i: 676,	target: -51.0170,	prediction: -14.9675,	loss:
0.7066			
i: 677,	target: 113.5140,	prediction: -2.0869,	loss:
1.0184			
i: 678,	target: -69.6150,	prediction: -12.4231,	loss:
0.8215			
i: 679,	target: -48.8980,	prediction: 91.4570,	loss:

2.8704			
i: 680,	target: -75.5320,	prediction: 73.9205,	loss:
1.9787			
i: 681,	target: -63.7750,	prediction: 39.4917,	loss:
1.6192			
i: 682,	target: 187.9790,	prediction: 154.4474,	loss:
0.1784			
i: 683,	target: 0.3530,	prediction: 55.4051,	loss:
155.9550			
i: 684,	target: 10.7880,	prediction: 13.1696,	loss:
0.2208			
i: 685,	target: -62.0490,	prediction: 34.6304,	loss:
1.5581			
i: 686,	target: -72.0870,	prediction: 37.2793,	loss:
1.5171			
i: 687,	target: -46.2880,	prediction: -61.5470,	loss:
0.3297			
i: 688,	target: 8.3800,	prediction: 47.9583,	loss:
4.7229			
i: 689,	target: -91.8880,	prediction: 60.4124,	loss:
1.6575			
i: 690,	target: -79.4910,	prediction: 40.2565,	loss:
1.5064			
i: 691,	target: 26.7690,	prediction: 119.5578,	loss:
3.4663			
i: 692,	target: 185.9260,	prediction: 78.0777,	loss:
0.5801			
i: 693,	target: -68.2220,	prediction: 12.3864,	loss:
1.1816			
i: 694,	target: 37.3950,	prediction: 128.2953,	loss:
2.4308			
i: 695,	target: -98.0430,	prediction: 50.7233,	loss:
1.5174			
i: 696,	target: 190.4240,	prediction: 119.1074,	loss:
0.3745			
i: 697,	target: -52.6740,	prediction: 23.9767,	loss:
1.4552			
i: 698,	target: 87.2450,	prediction: 7.5632,	loss:
0.9133			
i: 699,	target: -81.1380,	prediction: 129.3657,	loss:
2.5944			
i: 700,	target: 132.5940,	prediction: 82.1866,	loss:
0.3802			
i: 701,	target: 178.0450,	prediction: 77.1813,	loss:
0.5665			
i: 702,	target: -70.6010,	prediction: 10.0157,	loss:
1.1419			
i: 703,	target: 12.2650,	prediction: 118.6249,	loss:



8.6718			
i: 704,	target: 173.6350,	prediction: 109.3287,	loss:
0.3704			
i: 705,	target: -66.0460,	prediction: 51.8099,	loss:
1.7845			
i: 706,	target: 26.6730,	prediction: 7.8458,	loss:
0.7059			
i: 707,	target: -70.0280,	prediction: 28.9117,	loss:
1.4129			
i: 708,	target: -29.2670,	prediction: 37.8559,	loss:
2.2935			
i: 709,	target: -70.1390,	prediction: 80.3262,	loss:
2.1452			
i: 710,	target: 184.5760,	prediction: 55.7574,	loss:
0.6979			
i: 711,	target: -50.4210,	prediction: -43.6441,	loss:
0.1344			
i: 712,	target: 207.6330,	prediction: 107.5323,	loss:
0.4821			
i: 713,	target: -50.9610,	prediction: 100.2888,	loss:
2.9680			
i: 714,	target: 24.2920,	prediction: 96.4234,	loss:
2.9693			
i: 715,	target: 131.2590,	prediction: 93.3592,	loss:
0.2887			
i: 716,	target: -77.8590,	prediction: -19.0201,	loss:
0.7557			
i: 717,	target: -55.8630,	prediction: -15.2218,	loss:
0.7275			
i: 718,	target: -48.4000,	prediction: 69.3152,	loss:
2.4321			
i: 719,	target: -71.3690,	prediction: 18.0801,	loss:
1.2533			
i: 720,	target: 252.6980,	prediction: 75.8453,	loss:
0.6999			
i: 721,	target: -69.9230,	prediction: -28.9691,	loss:
0.5857			
i: 722,	target: -64.6950,	prediction: 26.1756,	loss:
1.4046			
i: 723,	target: 41.9760,	prediction: 16.8054,	loss:
0.5996			
i: 724,	target: 172.0020,	prediction: 48.4892,	loss:
0.7181			
i: 725,	target: -90.9360,	prediction: 123.3225,	loss:
2.3561			
i: 726,	target: 94.2720,	prediction: 17.2822,	loss:
0.8167			
i: 727,	target: -71.3670,	prediction: 32.4182,	loss:

1.4542			
i: 728,	target: -71.8380,	prediction: 64.5894,	loss:
1.8991			
i: 729,	target: -55.3620,	prediction: -23.0579,	loss:
0.5835			
i: 730,	target: 35.9910,	prediction: 58.1813,	loss:
0.6166			
i: 731,	target: -95.6130,	prediction: 83.8048,	loss:
1.8765			
i: 732,	target: -50.0570,	prediction: -5.5681,	loss:
0.8888			
i: 733,	target: -30.0770,	prediction: 67.5814,	loss:
3.2469			
i: 734,	target: 205.5380,	prediction: 118.1451,	loss:
0.4252			
i: 735,	target: -69.9340,	prediction: -23.0386,	loss:
0.6706			
i: 736,	target: 186.7950,	prediction: 29.3802,	loss:
0.8427			
i: 737,	target: -73.3110,	prediction: -4.0830,	loss:
0.9443			
i: 738,	target: -44.8990,	prediction: 141.7940,	loss:
4.1581			
i: 739,	target: -74.2880,	prediction: 4.6708,	loss:
1.0629			
i: 740,	target: 47.9320,	prediction: 20.9792,	loss:
0.5623			
i: 741,	target: -82.7740,	prediction: 7.0067,	loss:
1.0846			
i: 742,	target: 228.3920,	prediction: 99.4474,	loss:
0.5646			
i: 743,	target: -61.8250,	prediction: 10.2348,	loss:
1.1655			
i: 744,	target: -78.7270,	prediction: -34.7605,	loss:
0.5585			
i: 745,	target: -23.9000,	prediction: 141.6505,	loss:
6.9268			
i: 746,	target: 27.8760,	prediction: -9.0262,	loss:
1.3238			
i: 747,	target: -58.3720,	prediction: -0.3094,	loss:
0.9947			
i: 748,	target: -37.1630,	prediction: -10.9389,	loss:
0.7057			
i: 749,	target: -89.6800,	prediction: 21.9052,	loss:
1.2443			
i: 750,	target: -72.7730,	prediction: -41.5445,	loss:
0.4291			
i: 751,	target: -70.1670,	prediction: -22.9109,	loss:

0.6735			
i: 752,	target: 69.6040,	prediction: 106.2780,	loss:
0.5269			
i: 753,	target: 2.8210,	prediction: -5.3121,	loss:
2.8831			
i: 754,	target: -47.8690,	prediction: -3.9326,	loss:
0.9178			
i: 755,	target: 253.5370,	prediction: 46.1656,	loss:
0.8179			
i: 756,	target: 214.4820,	prediction: 15.7008,	loss:
0.9268			
i: 757,	target: 191.8340,	prediction: 41.2050,	loss:
0.7852			
i: 758,	target: 410.0220,	prediction: 65.7685,	loss:
0.8396			
i: 759,	target: -33.5260,	prediction: 13.2034,	loss:
1.3938			
i: 760,	target: 458.5770,	prediction: 203.9000,	loss:
0.5554			
i: 761,	target: -80.9290,	prediction: 11.0841,	loss:
1.1370			
i: 762,	target: 102.0850,	prediction: 7.0410,	loss:
0.9310			
i: 763,	target: -81.2650,	prediction: 55.4874,	loss:
1.6828			
i: 764,	target: 198.6120,	prediction: 41.9657,	loss:
0.7887			
i: 765,	target: -41.9830,	prediction: 114.7916,	loss:
3.7342			
i: 766,	target: 194.1060,	prediction: 10.4159,	loss:
0.9463			
i: 767,	target: -79.7440,	prediction: 6.3172,	loss:
1.0792			
i: 768,	target: -66.3400,	prediction: 13.3431,	loss:
1.2011			
i: 769,	target: 194.1540,	prediction: 51.7806,	loss:
0.7333			
i: 770,	target: -75.4850,	prediction: 34.7921,	loss:
1.4609			
i: 771,	target: -68.5730,	prediction: 2.4590,	loss:
1.0359			
i: 772,	target: -67.2500,	prediction: 108.3266,	loss:
2.6108			
i: 773,	target: 38.7200,	prediction: 19.8847,	loss:
0.4864			
i: 774,	target: 190.8020,	prediction: 93.6866,	loss:
0.5090			
i: 775,	target: -77.6810,	prediction: 51.1106,	loss:

1.6580			
i: 776,	target: 126.4180,	prediction: 131.2094,	loss:
0.0379			
i: 777,	target: 28.9580,	prediction: 93.8489,	loss:
2.2409			
i: 778,	target: -98.1920,	prediction: 12.5065,	loss:
1.1274			
i: 779,	target: 221.5800,	prediction: 12.0086,	loss:
0.9458			
i: 780,	target: -27.8310,	prediction: 17.8963,	loss:
1.6430			
i: 781,	target: -53.9520,	prediction: 13.7372,	loss:
1.2546			
i: 782,	target: -80.9910,	prediction: 64.9591,	loss:
1.8021			
i: 783,	target: -34.8870,	prediction: -10.2157,	loss:
0.7072			
i: 784,	target: 46.6190,	prediction: 48.1759,	loss:
0.0334			
i: 785,	target: -74.0340,	prediction: -42.9760,	loss:
0.4195			
i: 786,	target: -86.9730,	prediction: -17.9615,	loss:
0.7935			
i: 787,	target: 178.1260,	prediction: 41.2301,	loss:
0.7685			
i: 788,	target: 29.7620,	prediction: -74.6106,	loss:
3.5069			
i: 789,	target: -68.4240,	prediction: 41.6583,	loss:
1.6088			
i: 790,	target: 20.5940,	prediction: 122.0671,	loss:
4.9273			
i: 791,	target: 134.9500,	prediction: 112.6803,	loss:
0.1650			
i: 792,	target: 137.5190,	prediction: 63.1302,	loss:
0.5409			
i: 793,	target: 223.4950,	prediction: 63.6593,	loss:
0.7152			
i: 794,	target: 111.9290,	prediction: 32.9325,	loss:
0.7058			
i: 795,	target: -74.1260,	prediction: 94.7975,	loss:
2.2789			
i: 796,	target: 197.8870,	prediction: 113.8410,	loss:
0.4247			
i: 797,	target: 43.2530,	prediction: 40.0455,	loss:
0.0742			
i: 798,	target: -72.3670,	prediction: 39.8686,	loss:
1.5509			
i: 799,	target: -110.6630,	prediction: 62.6775,	loss:

1.5664			
i: 800,	target: 394.2210,	prediction: -25.6945,	loss:
1.0652			
i: 801,	target: 118.4380,	prediction: 59.0470,	loss:
0.5015			
i: 802,	target: 10.2060,	prediction: 148.0686,	loss:
13.5080			
i: 803,	target: 4.5860,	prediction: 46.7294,	loss:
9.1896			
i: 804,	target: 192.6480,	prediction: 144.2223,	loss:
0.2514			
i: 805,	target: 195.3360,	prediction: 113.2901,	loss:
0.4200			
i: 806,	target: -80.9060,	prediction: -7.1625,	loss:
0.9115			
i: 807,	target: -61.5850,	prediction: 114.0528,	loss:
2.8520			
i: 808,	target: -49.4240,	prediction: 141.2953,	loss:
3.8588			
i: 809,	target: -88.4000,	prediction: -0.4270,	loss:
0.9952			
i: 810,	target: 131.5930,	prediction: 155.0780,	loss:
0.1785			
i: 811,	target: -43.2570,	prediction: 98.0818,	loss:
3.2674			
i: 812,	target: 50.6370,	prediction: -13.6381,	loss:
1.2693			
i: 813,	target: -83.7210,	prediction: 33.5068,	loss:
1.4002			
i: 814,	target: 59.1300,	prediction: 5.9695,	loss:
0.8990			
i: 815,	target: -71.1060,	prediction: -38.2978,	loss:
0.4614			
i: 816,	target: 99.8080,	prediction: 101.7688,	loss:
0.0196			
i: 817,	target: 215.7750,	prediction: -49.8810,	loss:
1.2312			
i: 818,	target: 135.9930,	prediction: -14.1587,	loss:
1.1041			
i: 819,	target: -93.7270,	prediction: 68.3129,	loss:
1.7289			
i: 820,	target: 184.8010,	prediction: 83.4386,	loss:
0.5485			
i: 821,	target: -55.8560,	prediction: 55.6247,	loss:
1.9959			
i: 822,	target: -68.4870,	prediction: 70.3994,	loss:
2.0279			
i: 823,	target: 135.8860,	prediction: -14.4056,	loss:

1.1060			
i: 824,	target: -68.6910,	prediction: 96.8545,	loss:
2.4100			
i: 825,	target: -90.3510,	prediction: 15.0557,	loss:
1.1666			
i: 826,	target: -76.3280,	prediction: 37.5943,	loss:
1.4925			
i: 827,	target: -41.3430,	prediction: 7.4078,	loss:
1.1792			
i: 828,	target: -74.3510,	prediction: -18.0405,	loss:
0.7574			
i: 829,	target: 194.4240,	prediction: 136.9803,	loss:
0.2955			
i: 830,	target: -96.0430,	prediction: -16.1428,	loss:
0.8319			
i: 831,	target: -68.8110,	prediction: -29.1283,	loss:
0.5767			
i: 832,	target: 190.3440,	prediction: 118.6762,	loss:
0.3765			
i: 833,	target: -97.6290,	prediction: 63.4048,	loss:
1.6494			
i: 834,	target: 367.7810,	prediction: 88.7556,	loss:
0.7587			
i: 835,	target: -61.1700,	prediction: 99.4909,	loss:
2.6265			
i: 836,	target: 190.4240,	prediction: 137.0977,	loss:
0.2800			
i: 837,	target: -35.1990,	prediction: 121.9820,	loss:
4.4655			
i: 838,	target: -47.3680,	prediction: -47.5010,	loss:
0.0028			
i: 839,	target: 6.2640,	prediction: 112.1890,	loss:
16.9101			
i: 840,	target: -62.9970,	prediction: 1.6600,	loss:
1.0264			
i: 841,	target: 40.5130,	prediction: 5.5735,	loss:
0.8624			
i: 842,	target: 32.1280,	prediction: 39.4933,	loss:
0.2292			
i: 843,	target: -83.3390,	prediction: 31.4314,	loss:
1.3772			
i: 844,	target: 48.1180,	prediction: 152.8859,	loss:
2.1773			
i: 845,	target: -54.0350,	prediction: 112.6495,	loss:
3.0848			
i: 846,	target: -82.6770,	prediction: 91.4868,	loss:
2.1066			
i: 847,	target: -93.1940,	prediction: 36.2471,	loss:

1.3889			
i: 848,	target: 5.1520,	prediction: -18.9874,	loss:
4.6854			
i: 849,	target: 181.1110,	prediction: 39.8058,	loss:
0.7802			
i: 850,	target: 173.3570,	prediction: 51.6685,	loss:
0.7020			
i: 851,	target: 97.2620,	prediction: 61.1764,	loss:
0.3710			
i: 852,	target: -70.8290,	prediction: 67.5305,	loss:
1.9534			
i: 853,	target: 175.4270,	prediction: 68.2060,	loss:
0.6112			
i: 854,	target: -85.1180,	prediction: 56.3388,	loss:
1.6619			
i: 855,	target: -79.6720,	prediction: 13.1655,	loss:
1.1652			
i: 856,	target: -55.0500,	prediction: -14.5431,	loss:
0.7358			
i: 857,	target: 173.8930,	prediction: 66.6387,	loss:
0.6168			
i: 858,	target: -52.3070,	prediction: 63.1582,	loss:
2.2075			
i: 859,	target: -63.0480,	prediction: 48.9888,	loss:
1.7770			
i: 860,	target: -64.1090,	prediction: -21.4279,	loss:
0.6658			
i: 861,	target: 42.9500,	prediction: 57.4823,	loss:
0.3384			
i: 862,	target: -45.2080,	prediction: -34.4812,	loss:
0.2373			
i: 863,	target: 93.7600,	prediction: 71.7565,	loss:
0.2347			
i: 864,	target: 187.2310,	prediction: 62.7327,	loss:
0.6649			
i: 865,	target: 10.2650,	prediction: 27.4657,	loss:
1.6757			
i: 866,	target: -76.4970,	prediction: 68.3948,	loss:
1.8941			
i: 867,	target: 476.2500,	prediction: 98.5631,	loss:
0.7930			
i: 868,	target: -109.3280,	prediction: -0.7896,	loss:
0.9928			
i: 869,	target: -79.5520,	prediction: 16.2306,	loss:
1.2040			
i: 870,	target: -68.7830,	prediction: 17.1076,	loss:
1.2487			
i: 871,	target: -44.1830,	prediction: -53.6742,	loss:

0.2148			
i: 872,	target: -75.2140,	prediction: -1.2823,	loss:
0.9830			
i: 873,	target: 194.6200,	prediction: 65.8886,	loss:
0.6615			
i: 874,	target: 242.0520,	prediction: -7.6943,	loss:
1.0318			
i: 875,	target: -81.4240,	prediction: 106.5140,	loss:
2.3081			
i: 876,	target: -28.1020,	prediction: 66.6811,	loss:
3.3728			
i: 877,	target: -48.1350,	prediction: 14.9761,	loss:
1.3111			
i: 878,	target: -95.2030,	prediction: 55.0744,	loss:
1.5785			
i: 879,	target: 46.2600,	prediction: -65.2581,	loss:
2.4107			
i: 880,	target: -78.4910,	prediction: -8.5096,	loss:
0.8916			
i: 881,	target: -81.0490,	prediction: -48.2354,	loss:
0.4049			
i: 882,	target: -74.9330,	prediction: -23.5055,	loss:
0.6863			
i: 883,	target: -87.2460,	prediction: 12.5926,	loss:
1.1443			
i: 884,	target: -60.5510,	prediction: 28.3224,	loss:
1.4677			
i: 885,	target: 153.4990,	prediction: 154.8083,	loss:
0.0085			
i: 886,	target: -67.4370,	prediction: 74.1483,	loss:
2.0995			
i: 887,	target: 118.5920,	prediction: 108.2373,	loss:
0.0873			
i: 888,	target: 163.1140,	prediction: 142.2062,	loss:
0.1282			
i: 889,	target: 248.0520,	prediction: 44.7837,	loss:
0.8195			
i: 890,	target: -86.7260,	prediction: 10.6039,	loss:
1.1223			
i: 891,	target: -68.9690,	prediction: 20.0322,	loss:
1.2905			
i: 892,	target: 28.9020,	prediction: 120.7259,	loss:
3.1771			
i: 893,	target: -32.2860,	prediction: 96.9476,	loss:
4.0028			
i: 894,	target: 163.4350,	prediction: -11.3775,	loss:
1.0696			
i: 895,	target: -59.6110,	prediction: 43.8588,	loss:



1.7357			
i: 896,	target: 184.5370,	prediction: 65.1435,	loss:
0.6470			
i: 897,	target: 196.3760,	prediction: 108.4415,	loss:
0.4478			
i: 898,	target: -76.3880,	prediction: 25.8941,	loss:
1.3390			
i: 899,	target: 214.9010,	prediction: 80.8203,	loss:
0.6239			
i: 900,	target: -57.8990,	prediction: 2.3221,	loss:
1.0401			
i: 901,	target: -90.7620,	prediction: 46.8281,	loss:
1.5159			
i: 902,	target: -66.8650,	prediction: 68.0397,	loss:
2.0176			
i: 903,	target: -97.3460,	prediction: 118.7067,	loss:
2.2194			
i: 904,	target: 48.4310,	prediction: 131.9487,	loss:
1.7245			
i: 905,	target: 112.3030,	prediction: 146.9842,	loss:
0.3088			
i: 906,	target: -44.6000,	prediction: 64.9363,	loss:
2.4560			
i: 907,	target: -32.2080,	prediction: 62.4194,	loss:
2.9380			
i: 908,	target: -81.2600,	prediction: -26.3189,	loss:
0.6761			
i: 909,	target: -78.7070,	prediction: 96.8084,	loss:
2.2300			
i: 910,	target: -80.4220,	prediction: -2.3727,	loss:
0.9705			
i: 911,	target: -83.4970,	prediction: 101.8418,	loss:
2.2197			
i: 912,	target: 49.6550,	prediction: 18.5203,	loss:
0.6270			
i: 913,	target: -52.9170,	prediction: -28.2253,	loss:
0.4666			
i: 914,	target: 180.7210,	prediction: -10.3812,	loss:
1.0574			
i: 915,	target: -50.3660,	prediction: 106.9149,	loss:
3.1228			
i: 916,	target: -67.9780,	prediction: 10.1587,	loss:
1.1494			
i: 917,	target: -48.7600,	prediction: 10.3148,	loss:
1.2115			
i: 918,	target: -83.5510,	prediction: -13.7790,	loss:
0.8351			
i: 919,	target: -76.2000,	prediction: -30.8247,	loss:

0.5955			
i: 920,	target: -66.2600,	prediction: 51.0681,	loss:
1.7707			
i: 921,	target: -16.4920,	prediction: 19.0196,	loss:
2.1533			
i: 922,	target: -89.8440,	prediction: 70.8103,	loss:
1.7881			
i: 923,	target: 197.9490,	prediction: 63.1488,	loss:
0.6810			
i: 924,	target: 189.0340,	prediction: 88.4937,	loss:
0.5319			
i: 925,	target: -56.4240,	prediction: -16.3743,	loss:
0.7098			
i: 926,	target: 158.8430,	prediction: 23.7991,	loss:
0.8502			
i: 927,	target: -76.4070,	prediction: 45.6245,	loss:
1.5971			
i: 928,	target: -76.3710,	prediction: 78.6789,	loss:
2.0302			
i: 929,	target: 26.3460,	prediction: 29.4996,	loss:
0.1197			
i: 930,	target: 33.9070,	prediction: 113.1596,	loss:
2.3374			
i: 931,	target: -91.2080,	prediction: 100.6980,	loss:
2.1040			
i: 932,	target: -56.6350,	prediction: 30.7728,	loss:
1.5434			
i: 933,	target: -47.7910,	prediction: 79.4596,	loss:
2.6626			
i: 934,	target: -18.1180,	prediction: 45.7705,	loss:
3.5262			
i: 935,	target: -25.7460,	prediction: 45.3605,	loss:
2.7618			
i: 936,	target: -69.9210,	prediction: 114.1372,	loss:
2.6324			
i: 937,	target: -73.3060,	prediction: -65.9945,	loss:
0.0997			
i: 938,	target: 227.5990,	prediction: -0.5062,	loss:
1.0022			
i: 939,	target: 26.4470,	prediction: 135.9804,	loss:
4.1416			
i: 940,	target: -33.2670,	prediction: -51.0843,	loss:
0.5356			
i: 941,	target: -61.5950,	prediction: 37.0684,	loss:
1.6018			
i: 942,	target: 162.7760,	prediction: 124.4538,	loss:
0.2354			
i: 943,	target: 208.7910,	prediction: 77.9875,	loss:

0.6265			
i: 944,	target: 215.6070,	prediction: 21.1458,	loss:
0.9019			
i: 945,	target: -89.7840,	prediction: 167.1718,	loss:
2.8619			
i: 946,	target: 441.5490,	prediction: 41.4743,	loss:
0.9061			
i: 947,	target: -57.8970,	prediction: 56.7332,	loss:
1.9799			
i: 948,	target: 165.0750,	prediction: 146.6444,	loss:
0.1116			
i: 949,	target: -70.8440,	prediction: -16.7600,	loss:
0.7634			
i: 950,	target: 255.5480,	prediction: 122.3017,	loss:
0.5214			
i: 951,	target: 170.5180,	prediction: 28.4422,	loss:
0.8332			
i: 952,	target: -14.8550,	prediction: 87.1891,	loss:
6.8693			
i: 953,	target: -79.5830,	prediction: 62.7582,	loss:
1.7886			
i: 954,	target: 98.3170,	prediction: 93.9742,	loss:
0.0442			
i: 955,	target: 212.0060,	prediction: 47.6480,	loss:
0.7753			
i: 956,	target: -105.0160,	prediction: 83.9379,	loss:
1.7993			
i: 957,	target: -84.2340,	prediction: -5.7062,	loss:
0.9323			
i: 958,	target: 239.1320,	prediction: -0.9692,	loss:
1.0041			
i: 959,	target: -74.8200,	prediction: -6.0843,	loss:
0.9187			
i: 960,	target: 114.2280,	prediction: 95.2821,	loss:
0.1659			
i: 961,	target: 193.3740,	prediction: 61.2151,	loss:
0.6834			
i: 962,	target: -55.1940,	prediction: 60.3267,	loss:
2.0930			
i: 963,	target: 464.1120,	prediction: 68.2819,	loss:
0.8529			
i: 964,	target: -68.8150,	prediction: 55.4472,	loss:
1.8057			
i: 965,	target: -45.6850,	prediction: -18.9844,	loss:
0.5845			
i: 966,	target: -107.4220,	prediction: 90.4057,	loss:
1.8416			
i: 967,	target: 201.5040,	prediction: 20.6066,	loss:

0.8977			
i: 968,	target: -61.4460,	prediction: 64.9034,	loss:
2.0563			
i: 969,	target: 242.9050,	prediction: 59.5831,	loss:
0.7547			
i: 970,	target: 83.2440,	prediction: 130.4906,	loss:
0.5676			
i: 971,	target: -51.8890,	prediction: 73.3449,	loss:
2.4135			
i: 972,	target: 44.6010,	prediction: -1.7319,	loss:
1.0388			
i: 973,	target: 223.8240,	prediction: 15.0977,	loss:
0.9325			
i: 974,	target: 159.8650,	prediction: 124.9847,	loss:
0.2182			
i: 975,	target: -55.9800,	prediction: 12.8992,	loss:
1.2304			
i: 976,	target: 44.7000,	prediction: 85.6158,	loss:
0.9153			
i: 977,	target: -36.2000,	prediction: 55.6108,	loss:
2.5362			
i: 978,	target: -69.7620,	prediction: -7.2493,	loss:
0.8961			
i: 979,	target: 70.5350,	prediction: 46.6727,	loss:
0.3383			
i: 980,	target: -25.2650,	prediction: 111.8955,	loss:
5.4289			
i: 981,	target: 202.0760,	prediction: 133.0912,	loss:
0.3414			
i: 982,	target: -62.0390,	prediction: -36.1107,	loss:
0.4179			
i: 983,	target: -20.9030,	prediction: 56.6156,	loss:
3.7085			
i: 984,	target: 194.9080,	prediction: 124.1712,	loss:
0.3629			
i: 985,	target: 63.9040,	prediction: 20.7123,	loss:
0.6759			
i: 986,	target: -75.5770,	prediction: 112.9339,	loss:
2.4943			
i: 987,	target: -52.0090,	prediction: 17.3193,	loss:
1.3330			
i: 988,	target: -60.8800,	prediction: 108.6336,	loss:
2.7844			
i: 989,	target: -74.1160,	prediction: 27.1369,	loss:
1.3661			
i: 990,	target: 231.4670,	prediction: 35.5010,	loss:
0.8466			
i: 991,	target: -75.2920,	prediction: 65.8344,	loss:

1.8744			
i: 992,	target: -54.7550,	prediction: -30.9590,	loss:
0.4346			
i: 993,	target: 209.0050,	prediction: 73.2108,	loss:
0.6497			
i: 994,	target: -66.3140,	prediction: -2.0433,	loss:
0.9692			
i: 995,	target: 175.0030,	prediction: 24.8614,	loss:
0.8579			
i: 996,	target: 108.6440,	prediction: 44.8637,	loss:
0.5871			
i: 997,	target: -67.3900,	prediction: -19.4144,	loss:
0.7119			
i: 998,	target: 186.9540,	prediction: 134.7314,	loss:
0.2793			
i: 999,	target: -94.7180,	prediction: -2.1888,	loss:
0.9769			

Average loss: 2.4301

Saved in: peptide-QML/checkpoints/0810/txts/0810-sh\_em\_1qm\_v2\_validation\_6.txt

i: 977,	target: -36.2000,	prediction: 55.6108,	loss:
2.5362			
i: 978,	target: -69.7620,	prediction: -7.2493,	loss:
0.8961			
i: 979,	target: 70.5350,	prediction: 46.6727,	loss:
0.3383			
i: 980,	target: -25.2650,	prediction: 111.8955,	loss:
5.4289			
i: 981,	target: 202.0760,	prediction: 133.0912,	loss:
0.3414			
i: 982,	target: -62.0390,	prediction: -36.1107,	loss:
0.4179			
i: 983,	target: -20.9030,	prediction: 56.6156,	loss:
3.7085			
i: 984,	target: 194.9080,	prediction: 124.1712,	loss:
0.3629			
i: 985,	target: 63.9040,	prediction: 20.7123,	loss:
0.6759			
i: 986,	target: -75.5770,	prediction: 112.9339,	loss:
2.4943			
i: 987,	target: -52.0090,	prediction: 17.3193,	loss:
1.3330			
i: 988,	target: -60.8800,	prediction: 108.6336,	loss:
2.7844			
i: 989,	target: -74.1160,	prediction: 27.1369,	loss:
1.3661			
i: 990,	target: 231.4670,	prediction: 35.5010,	loss:
0.8466			

i: 991,	target: -75.2920,	prediction: 65.8344,	loss:
1.8744			
i: 992,	target: -54.7550,	prediction: -30.9590,	loss:
0.4346			
i: 993,	target: 209.0050,	prediction: 73.2108,	loss:
0.6497			
i: 994,	target: -66.3140,	prediction: -2.0433,	loss:
0.9692			
i: 995,	target: 175.0030,	prediction: 24.8614,	loss:
0.8579			
i: 996,	target: 108.6440,	prediction: 44.8637,	loss:
0.5871			
i: 997,	target: -67.3900,	prediction: -19.4144,	loss:
0.7119			
i: 998,	target: 186.9540,	prediction: 134.7314,	loss:
0.2793			
i: 999,	target: -94.7180,	prediction: -2.1888,	loss:
0.9769			

Average loss: 2.4301

Saved in: peptide-QML/checkpoints/0810/txts/0810-sh\_em\_1qm\_v2\_validation\_6.txt

```
[ ]: # push changes to git
if initial_path != '../':
    !cd peptide-QML && git add . && git commit -m "data trained model" && git_
    ↪push
```

```
[main a3aaaaa7] data trained model
14 files changed, 1044 insertions(+), 1 deletion(-)
create mode 100644 checkpoints/0810/models/0810-sh_em_1qm_v2_6.pth
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_losses_batches_6.png
create mode 100644 checkpoints/0810/plots/0810-sh_em_1qm_v2_losses_epoch_6.png
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_losses_epoch_validation_6.png
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_parameter_0.weight_None_6.png
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_parameter_2.block_weights_None_6.png
create mode 100644 checkpoints/0810/plots/0810-
sh_em_1qm_v2_parameter_2.embedding_weights_None_6.png
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_parameter_3.bias_None_6.png
create mode 100644
checkpoints/0810/plots/0810-sh_em_1qm_v2_parameter_3.weight_None_6.png
create mode 100644 checkpoints/0810/plots/0810-sh_em_1qm_v2_validation_6.png
create mode 100644 checkpoints/0810/txts/0810-sh_em_1qm_v2_model_str_6.txt
create mode 100644 checkpoints/0810/txts/0810-sh_em_1qm_v2_validation_6.txt
create mode 100644 checkpoints/0810/versions/0810-nh_em_1qm.version
```

```
Enumerating objects: 29, done.  
Counting objects: 100% (29/29), done.  
Delta compression using up to 24 threads  
Compressing objects: 100% (20/20), done.  
Writing objects: 100% (21/21), 224.14 KiB | 8.00 MiB/s, done.  
Total 21 (delta 2), reused 0 (delta 0)  
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.  
To github.com:raulconchello/peptide-QML.git  
    10a053e4..a3aaaaa7  main -> main
```

[ ]: