

0809-sh_e_1qm_v2

August 10, 2023

```
[ ]: initial_path = 'peptide-QML/'  
# initial_path = '../'
```

```
[ ]: day = "0809"  
name_notebook = day + "-sh_e_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
```

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 = False,
    block_n_layers = 50,
    # wrapper_qlayer = pw.QLayer,
    wrapper_qlayer = None,
)

[ ]: quantum_layer.weights_shape, quantum_layer.input_shape

[ ]: ({'block_weights': (600,)}, (4,))

[ ]: 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'

```

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]

```

3 Hybrid model

```
[ ]: 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)]

```

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[ ]: # 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 = model.model[0](input_data[0:2])
print(x, x.shape)

x = model.model[1](x)
print(x, x.shape)

x = model.model[2](x)
print(x)

```

```

tensor([[[ 1.2578],
          [-0.1031],
          [-0.0697],
          [ 0.5138]],

        [[ 1.2578],
          [ 0.2743],
          [ 0.3109],

```

```

        [-1.4168]]], grad_fn=<EmbeddingBackward>) torch.Size([2, 4, 1])
tensor([[ 1.2578, -0.1031, -0.0697,  0.5138],
        [ 1.2578,  0.2743,  0.3109, -1.4168]], grad_fn=<SqueezeBackward0>)
torch.Size([2, 4])
tensor([[0.0728],
        [0.0755]], grad_fn=<ViewBackward>)

```

```

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

    x = model.model[1](x)
    print(x, x.shape)

    x = model.model[2](x)
    print(i, x)

```

```

tensor([[ 1.2578],
        [-0.1031],
        [-0.0697],
        [ 0.5138]], grad_fn=<EmbeddingBackward>) torch.Size([4, 1])
tensor([ 1.2578, -0.1031, -0.0697,  0.5138], grad_fn=<SqueezeBackward0>)
torch.Size([4])
0 tensor([0.0728], grad_fn=<CatBackward>)
tensor([[ 1.2578],
        [ 0.2743],
        [ 0.3109],
        [-1.4168]], grad_fn=<EmbeddingBackward>) torch.Size([4, 1])
tensor([ 1.2578,  0.2743,  0.3109, -1.4168], grad_fn=<SqueezeBackward0>)
torch.Size([4])
1 tensor([0.0755], grad_fn=<CatBackward>)

```

```

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

```

```

tensor([[0.2431],
        [0.2438]], grad_fn=<AddmmBackward>)
tensor([0.2438], grad_fn=<AddBackward0>)

```

```

[ ]: model.keep_track_params=True,

```

```

[ ]: 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.Adam,
    optimizer_options={'lr': 0.05},
    num_epochs = 50,
    batch_size = 32,
)

```

Epoch [0/50], Loss: 0.9997, Loss validation: 0.9995

/usr/lib/python3/dist-packages/torch/autograd/__init__.py:147: UserWarning: CUDA initialization: Unexpected error from cudaGetDeviceCount(). Did you run some cuda functions before calling NumCudaDevices() that might have already set an error? Error 804: forward compatibility was attempted on non supported HW (Triggered internally at ../c10/cuda/CUDAFuncions.cpp:115.)

Variable._execution_engine.run_backward(

Validation string,	i: 0;	prediction: 24.6563,	target:
169.8080,	loss: 0.8548		

Validation string,	i: 1;	prediction: -3.5038,	target:
227.1110,	loss: 1.0154		

Validation string,	i: 2;	prediction: 0.6896,	target:
-89.3500,	loss: 1.0077		

Epoch [1/50], Loss: 0.9622, Loss validation: 0.9105, Time remaining: ~1.0h 36.0m 52s

Validation string,	i: 0;	prediction: 34.4815,	target:
169.8080,	loss: 0.7969		

Validation string,	i: 1;	prediction: 13.8205,	target:
227.1110,	loss: 0.9391		

Validation string,	i: 2;	prediction: 6.9553,	target:
-89.3500,	loss: 1.0778		

Epoch [2/50], Loss: 0.9008, Loss validation: 0.8898, Time remaining: ~1.0h 28.0m 42s

Validation string,	i: 0;	prediction: 59.8102,	target:
169.8080,	loss: 0.6478		

Validation string,	i: 1;	prediction: -11.6560,	target:
227.1110,	loss: 1.0513		

Validation string,	i: 2;	prediction: -12.5133,	target:
-89.3500,	loss: 0.8600		

Epoch [3/50], Loss: 0.8535, Loss validation: 0.7841, Time remaining: ~1.0h 25.0m 1s

Validation string,	i: 0;	prediction: 69.7360,	target:
169.8080,	loss: 0.5893		

Validation string,	i: 1;	prediction: -15.1739,	target:
227.1110,	loss: 1.0668		

Validation string,	i: 2;	prediction: -16.7633,	target:
-89.3500,	loss: 0.8124		

Epoch [4/50], Loss: 0.8038, Loss validation: 0.7480, Time remaining: ~1.0h 22.0m 25s

Validation string,	i: 0;	prediction: 93.2339,	target:
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169.8080,      loss: 0.4509
      Validation string,      i: 1;  prediction: -12.8165,  target:
227.1110,      loss: 1.0564
      Validation string,      i: 2;  prediction: -21.1246,  target:
-89.3500,      loss: 0.7636
Epoch [5/50], Loss: 0.7586, Loss validation: 0.6845, Time remaining: ~1.0h 20.0m
8s
      Validation string,      i: 0;  prediction: 91.8270,  target:
169.8080,      loss: 0.4592
      Validation string,      i: 1;  prediction: -28.2767,  target:
227.1110,      loss: 1.1245
      Validation string,      i: 2;  prediction: -32.5470,  target:
-89.3500,      loss: 0.6357
Epoch [6/50], Loss: 0.7292, Loss validation: 0.7073, Time remaining: ~1.0h 18.0m
2s
      Validation string,      i: 0;  prediction: 120.9209,  target:
169.8080,      loss: 0.2879
      Validation string,      i: 1;  prediction: -6.0711,  target:
227.1110,      loss: 1.0267
      Validation string,      i: 2;  prediction: -31.6772,  target:
-89.3500,      loss: 0.6455
Epoch [7/50], Loss: 0.7170, Loss validation: 0.6361, Time remaining: ~1.0h 16.0m
3s
      Validation string,      i: 0;  prediction: 120.2018,  target:
169.8080,      loss: 0.2921
      Validation string,      i: 1;  prediction: -14.8864,  target:
227.1110,      loss: 1.0655
      Validation string,      i: 2;  prediction: -8.5322,  target:
-89.3500,      loss: 0.9045
Epoch [8/50], Loss: 0.6850, Loss validation: 0.6741, Time remaining: ~1.0h 14.0m
10s
      Validation string,      i: 0;  prediction: 121.4943,  target:
169.8080,      loss: 0.2845
      Validation string,      i: 1;  prediction: -36.6259,  target:
227.1110,      loss: 1.1613
      Validation string,      i: 2;  prediction: -27.1018,  target:
-89.3500,      loss: 0.6967
Epoch [9/50], Loss: 0.6782, Loss validation: 0.6488, Time remaining: ~1.0h 12.0m
16s
      Validation string,      i: 0;  prediction: 142.2757,  target:
169.8080,      loss: 0.1621
      Validation string,      i: 1;  prediction: -5.4553,  target:
227.1110,      loss: 1.0240
      Validation string,      i: 2;  prediction: -45.5132,  target:
-89.3500,      loss: 0.4906
Epoch [10/50], Loss: 0.6705, Loss validation: 0.6174, Time remaining: ~1.0h
10.0m 26s
      Validation string,      i: 0;  prediction: 146.1756,  target:

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169.8080,      loss: 0.1392
      Validation string,      i: 1;  prediction: -51.9042,  target:
227.1110,      loss: 1.2285
      Validation string,      i: 2;  prediction: -62.4664,  target:
-89.3500,      loss: 0.3009
Epoch [11/50], Loss: 0.6669, Loss validation: 0.6030, Time remaining: ~1.0h 8.0m
38s
      Validation string,      i: 0;  prediction: 155.1513,  target:
169.8080,      loss: 0.0863
      Validation string,      i: 1;  prediction: -33.9797,  target:
227.1110,      loss: 1.1496
      Validation string,      i: 2;  prediction: -43.6527,  target:
-89.3500,      loss: 0.5114
Epoch [12/50], Loss: 0.6463, Loss validation: 0.5957, Time remaining: ~1.0h 6.0m
50s
      Validation string,      i: 0;  prediction: 126.9525,  target:
169.8080,      loss: 0.2524
      Validation string,      i: 1;  prediction: -36.8501,  target:
227.1110,      loss: 1.1623
      Validation string,      i: 2;  prediction: -43.6151,  target:
-89.3500,      loss: 0.5119
Epoch [13/50], Loss: 0.6425, Loss validation: 0.5817, Time remaining: ~1.0h 5.0m
4s
      Validation string,      i: 0;  prediction: 164.4917,  target:
169.8080,      loss: 0.0313
      Validation string,      i: 1;  prediction: 27.6083,  target:
227.1110,      loss: 0.8784
      Validation string,      i: 2;  prediction: -59.1079,  target:
-89.3500,      loss: 0.3385
Epoch [14/50], Loss: 0.6344, Loss validation: 0.5959, Time remaining: ~1.0h 3.0m
19s
      Validation string,      i: 0;  prediction: 155.1615,  target:
169.8080,      loss: 0.0863
      Validation string,      i: 1;  prediction: -55.7606,  target:
227.1110,      loss: 1.2455
      Validation string,      i: 2;  prediction: -50.5073,  target:
-89.3500,      loss: 0.4347
Epoch [15/50], Loss: 0.6427, Loss validation: 0.5541, Time remaining: ~1.0h 1.0m
34s
      Validation string,      i: 0;  prediction: 150.4020,  target:
169.8080,      loss: 0.1143
      Validation string,      i: 1;  prediction: -17.4022,  target:
227.1110,      loss: 1.0766
      Validation string,      i: 2;  prediction: -63.2522,  target:
-89.3500,      loss: 0.2921
Epoch [16/50], Loss: 0.6344, Loss validation: 0.6045, Time remaining: ~0.0h
59.0m 49s
      Validation string,      i: 0;  prediction: 95.4974,  target:

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169.8080,      loss: 0.4376
      Validation string,      i: 1;  prediction: -37.3641,  target:
227.1110,      loss: 1.1645
      Validation string,      i: 2;  prediction: -77.3818,  target:
-89.3500,      loss: 0.1339
Epoch [17/50], Loss: 0.6362, Loss validation: 0.6059, Time remaining: ~0.0h
58.0m 3s
      Validation string,      i: 0;  prediction: 148.5119,  target:
169.8080,      loss: 0.1254
      Validation string,      i: 1;  prediction: -29.7726,  target:
227.1110,      loss: 1.1311
      Validation string,      i: 2;  prediction: -43.3158,  target:
-89.3500,      loss: 0.5152
Epoch [18/50], Loss: 0.6368, Loss validation: 0.6034, Time remaining: ~0.0h
56.0m 18s
      Validation string,      i: 0;  prediction: 164.9503,  target:
169.8080,      loss: 0.0286
      Validation string,      i: 1;  prediction: -51.0575,  target:
227.1110,      loss: 1.2248
      Validation string,      i: 2;  prediction: -77.5418,  target:
-89.3500,      loss: 0.1322
Epoch [19/50], Loss: 0.6357, Loss validation: 0.5595, Time remaining: ~0.0h
54.0m 33s
      Validation string,      i: 0;  prediction: 132.9489,  target:
169.8080,      loss: 0.2171
      Validation string,      i: 1;  prediction: 6.4964,  target:
227.1110,      loss: 0.9714
      Validation string,      i: 2;  prediction: -50.2362,  target:
-89.3500,      loss: 0.4378
Epoch [20/50], Loss: 0.6300, Loss validation: 0.6466, Time remaining: ~0.0h
52.0m 48s
      Validation string,      i: 0;  prediction: 173.8118,  target:
169.8080,      loss: 0.0236
      Validation string,      i: 1;  prediction: -31.7912,  target:
227.1110,      loss: 1.1400
      Validation string,      i: 2;  prediction: -27.3390,  target:
-89.3500,      loss: 0.6940
Epoch [21/50], Loss: 0.6324, Loss validation: 0.6383, Time remaining: ~0.0h
51.0m 3s
      Validation string,      i: 0;  prediction: 200.1225,  target:
169.8080,      loss: 0.1785
      Validation string,      i: 1;  prediction: 29.1846,  target:
227.1110,      loss: 0.8715
      Validation string,      i: 2;  prediction: -78.8190,  target:
-89.3500,      loss: 0.1179
Epoch [22/50], Loss: 0.6291, Loss validation: 0.6843, Time remaining: ~0.0h
49.0m 17s
      Validation string,      i: 0;  prediction: 99.0147,  target:

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169.8080,      loss: 0.4169
    Validation string,      i: 1;  prediction: 95.4924,  target:
227.1110,      loss: 0.5795
    Validation string,      i: 2;  prediction: -34.2951,  target:
-89.3500,      loss: 0.6162
Epoch [23/50], Loss: 0.6278, Loss validation: 0.5561, Time remaining: ~0.0h
47.0m 33s
    Validation string,      i: 0;  prediction: 127.8549,  target:
169.8080,      loss: 0.2471
    Validation string,      i: 1;  prediction: -66.7733,  target:
227.1110,      loss: 1.2940
    Validation string,      i: 2;  prediction: -62.6035,  target:
-89.3500,      loss: 0.2993
Epoch [24/50], Loss: 0.6364, Loss validation: 0.6220, Time remaining: ~0.0h
45.0m 48s
    Validation string,      i: 0;  prediction: 199.2456,  target:
169.8080,      loss: 0.1734
    Validation string,      i: 1;  prediction: -42.5410,  target:
227.1110,      loss: 1.1873
    Validation string,      i: 2;  prediction: -28.3200,  target:
-89.3500,      loss: 0.6830
Epoch [25/50], Loss: 0.6240, Loss validation: 0.5583, Time remaining: ~0.0h
44.0m 2s
    Validation string,      i: 0;  prediction: 146.3538,  target:
169.8080,      loss: 0.1381
    Validation string,      i: 1;  prediction: -29.0383,  target:
227.1110,      loss: 1.1279
    Validation string,      i: 2;  prediction: -50.2461,  target:
-89.3500,      loss: 0.4376
Epoch [26/50], Loss: 0.6268, Loss validation: 0.7102, Time remaining: ~0.0h
42.0m 17s
    Validation string,      i: 0;  prediction: 161.7971,  target:
169.8080,      loss: 0.0472
    Validation string,      i: 1;  prediction: -33.6821,  target:
227.1110,      loss: 1.1483
    Validation string,      i: 2;  prediction: -83.6606,  target:
-89.3500,      loss: 0.0637
Epoch [27/50], Loss: 0.6307, Loss validation: 0.5464, Time remaining: ~0.0h
40.0m 32s
    Validation string,      i: 0;  prediction: 180.5260,  target:
169.8080,      loss: 0.0631
    Validation string,      i: 1;  prediction: 33.9364,  target:
227.1110,      loss: 0.8506
    Validation string,      i: 2;  prediction: -56.2055,  target:
-89.3500,      loss: 0.3710
Epoch [28/50], Loss: 0.6353, Loss validation: 0.6341, Time remaining: ~0.0h
38.0m 47s
    Validation string,      i: 0;  prediction: 137.2264,  target:

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169.8080,      loss: 0.1919
      Validation string,      i: 1;  prediction: 7.8609,      target:
227.1110,      loss: 0.9654
      Validation string,      i: 2;  prediction: -52.8087,      target:
-89.3500,      loss: 0.4090
Epoch [29/50], Loss: 0.6391, Loss validation: 0.5703, Time remaining: ~0.0h
37.0m 2s
      Validation string,      i: 0;  prediction: 181.6166,      target:
169.8080,      loss: 0.0695
      Validation string,      i: 1;  prediction: 84.6846,      target:
227.1110,      loss: 0.6271
      Validation string,      i: 2;  prediction: -30.2263,      target:
-89.3500,      loss: 0.6617
Epoch [30/50], Loss: 0.6322, Loss validation: 0.6412, Time remaining: ~0.0h
35.0m 17s
      Validation string,      i: 0;  prediction: 150.6140,      target:
169.8080,      loss: 0.1130
      Validation string,      i: 1;  prediction: 36.4301,      target:
227.1110,      loss: 0.8396
      Validation string,      i: 2;  prediction: -73.1607,      target:
-89.3500,      loss: 0.1812
Epoch [31/50], Loss: 0.6238, Loss validation: 0.6315, Time remaining: ~0.0h
33.0m 32s
      Validation string,      i: 0;  prediction: 207.2665,      target:
169.8080,      loss: 0.2206
      Validation string,      i: 1;  prediction: 91.1142,      target:
227.1110,      loss: 0.5988
      Validation string,      i: 2;  prediction: -60.6007,      target:
-89.3500,      loss: 0.3218
Epoch [32/50], Loss: 0.6298, Loss validation: 0.6123, Time remaining: ~0.0h
31.0m 46s
      Validation string,      i: 0;  prediction: 223.0176,      target:
169.8080,      loss: 0.3134
      Validation string,      i: 1;  prediction: -33.0162,      target:
227.1110,      loss: 1.1454
      Validation string,      i: 2;  prediction: -41.6469,      target:
-89.3500,      loss: 0.5339
Epoch [33/50], Loss: 0.6344, Loss validation: 0.5586, Time remaining: ~0.0h
30.0m 1s
      Validation string,      i: 0;  prediction: 175.8427,      target:
169.8080,      loss: 0.0355
      Validation string,      i: 1;  prediction: -65.9299,      target:
227.1110,      loss: 1.2903
      Validation string,      i: 2;  prediction: -32.3980,      target:
-89.3500,      loss: 0.6374
Epoch [34/50], Loss: 0.6262, Loss validation: 0.6375, Time remaining: ~0.0h
28.0m 16s
      Validation string,      i: 0;  prediction: 135.2860,      target:

```

```

169.8080,      loss: 0.2033
      Validation string,      i: 1;  prediction: 62.0193,  target:
227.1110,      loss: 0.7269
      Validation string,      i: 2;  prediction: -72.4954,  target:
-89.3500,      loss: 0.1886
Epoch [35/50], Loss: 0.6211, Loss validation: 0.6267, Time remaining: ~0.0h
26.0m 30s
      Validation string,      i: 0;  prediction: 180.9763,  target:
169.8080,      loss: 0.0658
      Validation string,      i: 1;  prediction: -11.8122,  target:
227.1110,      loss: 1.0520
      Validation string,      i: 2;  prediction: -12.0222,  target:
-89.3500,      loss: 0.8654
Epoch [36/50], Loss: 0.6248, Loss validation: 0.8310, Time remaining: ~0.0h
24.0m 45s
      Validation string,      i: 0;  prediction: 190.6608,  target:
169.8080,      loss: 0.1228
      Validation string,      i: 1;  prediction: -33.7341,  target:
227.1110,      loss: 1.1485
      Validation string,      i: 2;  prediction: -40.2913,  target:
-89.3500,      loss: 0.5491
Epoch [37/50], Loss: 0.6370, Loss validation: 0.6044, Time remaining: ~0.0h
22.0m 59s
      Validation string,      i: 0;  prediction: 185.5488,  target:
169.8080,      loss: 0.0927
      Validation string,      i: 1;  prediction: 14.0230,  target:
227.1110,      loss: 0.9383
      Validation string,      i: 2;  prediction: -68.6192,  target:
-89.3500,      loss: 0.2320
Epoch [38/50], Loss: 0.6198, Loss validation: 0.5893, Time remaining: ~0.0h
21.0m 13s
      Validation string,      i: 0;  prediction: 92.9746,  target:
169.8080,      loss: 0.4525
      Validation string,      i: 1;  prediction: 6.0657,  target:
227.1110,      loss: 0.9733
      Validation string,      i: 2;  prediction: -77.2146,  target:
-89.3500,      loss: 0.1358
Epoch [39/50], Loss: 0.6221, Loss validation: 0.6418, Time remaining: ~0.0h
19.0m 27s
      Validation string,      i: 0;  prediction: 175.8302,  target:
169.8080,      loss: 0.0355
      Validation string,      i: 1;  prediction: -43.8098,  target:
227.1110,      loss: 1.1929
      Validation string,      i: 2;  prediction: -75.1319,  target:
-89.3500,      loss: 0.1591
Epoch [40/50], Loss: 0.6347, Loss validation: 0.5832, Time remaining: ~0.0h
17.0m 41s
      Validation string,      i: 0;  prediction: 166.8615,  target:

```

```

169.8080,      loss: 0.0174
      Validation string,      i: 1;  prediction: 52.5719,  target:
227.1110,      loss: 0.7685
      Validation string,      i: 2;  prediction: -60.1611,  target:
-89.3500,      loss: 0.3267
Epoch [41/50], Loss: 0.6258, Loss validation: 0.5752, Time remaining: ~0.0h
15.0m 56s
      Validation string,      i: 0;  prediction: 134.6648,  target:
169.8080,      loss: 0.2070
      Validation string,      i: 1;  prediction: -7.5715,  target:
227.1110,      loss: 1.0333
      Validation string,      i: 2;  prediction: -16.5094,  target:
-89.3500,      loss: 0.8152
Epoch [42/50], Loss: 0.6270, Loss validation: 0.6426, Time remaining: ~0.0h
14.0m 10s
      Validation string,      i: 0;  prediction: 187.8090,  target:
169.8080,      loss: 0.1060
      Validation string,      i: 1;  prediction: 34.7273,  target:
227.1110,      loss: 0.8471
      Validation string,      i: 2;  prediction: -50.7284,  target:
-89.3500,      loss: 0.4323
Epoch [43/50], Loss: 0.6225, Loss validation: 0.6068, Time remaining: ~0.0h
12.0m 24s
      Validation string,      i: 0;  prediction: 142.2178,  target:
169.8080,      loss: 0.1625
      Validation string,      i: 1;  prediction: 44.1073,  target:
227.1110,      loss: 0.8058
      Validation string,      i: 2;  prediction: -36.2791,  target:
-89.3500,      loss: 0.5940
Epoch [44/50], Loss: 0.6228, Loss validation: 0.5665, Time remaining: ~0.0h
10.0m 38s
      Validation string,      i: 0;  prediction: 210.8493,  target:
169.8080,      loss: 0.2417
      Validation string,      i: 1;  prediction: 64.8002,  target:
227.1110,      loss: 0.7147
      Validation string,      i: 2;  prediction: -56.0077,  target:
-89.3500,      loss: 0.3732
Epoch [45/50], Loss: 0.6277, Loss validation: 0.6290, Time remaining: ~0.0h 8.0m
51s
      Validation string,      i: 0;  prediction: 187.6227,  target:
169.8080,      loss: 0.1049
      Validation string,      i: 1;  prediction: 72.0052,  target:
227.1110,      loss: 0.6830
      Validation string,      i: 2;  prediction: -19.8721,  target:
-89.3500,      loss: 0.7776
Epoch [46/50], Loss: 0.6216, Loss validation: 0.5982, Time remaining: ~0.0h 7.0m
5s
      Validation string,      i: 0;  prediction: 136.9735,  target:

```

```

169.8080,      loss: 0.1934
      Validation string,      i: 1;  prediction: 52.6877,      target:
227.1110,      loss: 0.7680
      Validation string,      i: 2;  prediction: -47.9331,      target:
-89.3500,      loss: 0.4635
Epoch [47/50], Loss: 0.6209, Loss validation: 0.5716, Time remaining: ~0.0h 5.0m
19s
      Validation string,      i: 0;  prediction: 174.4602,      target:
169.8080,      loss: 0.0274
      Validation string,      i: 1;  prediction: 82.2145,      target:
227.1110,      loss: 0.6380
      Validation string,      i: 2;  prediction: -64.5867,      target:
-89.3500,      loss: 0.2771
Epoch [48/50], Loss: 0.6242, Loss validation: 0.7262, Time remaining: ~0.0h 3.0m
33s
      Validation string,      i: 0;  prediction: 90.6298,      target:
169.8080,      loss: 0.4663
      Validation string,      i: 1;  prediction: 124.9349,      target:
227.1110,      loss: 0.4499
      Validation string,      i: 2;  prediction: -6.8485,      target:
-89.3500,      loss: 0.9234
Epoch [49/50], Loss: 0.6200, Loss validation: 0.6330, Time remaining: ~0.0h 1.0m
46s
      Validation string,      i: 0;  prediction: 198.1978,      target:
169.8080,      loss: 0.1672
      Validation string,      i: 1;  prediction: -34.2547,      target:
227.1110,      loss: 1.1508
      Validation string,      i: 2;  prediction: -92.2134,      target:
-89.3500,      loss: 0.0320
Epoch [50/50], Loss: 0.6247, Loss validation: 0.6140, Time remaining: ~0.0h 0.0m
0s

```

```

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

```

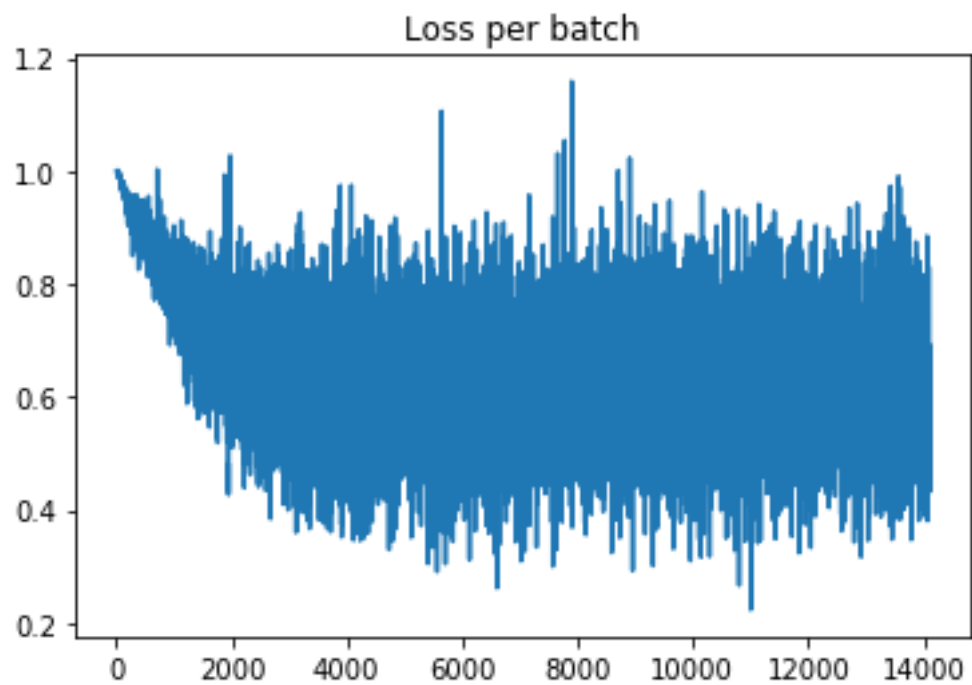
Saved in: peptide-QML/checkpoints/0809/txts/0809-sh_e_1qm_v2_model_str_1.txt

```

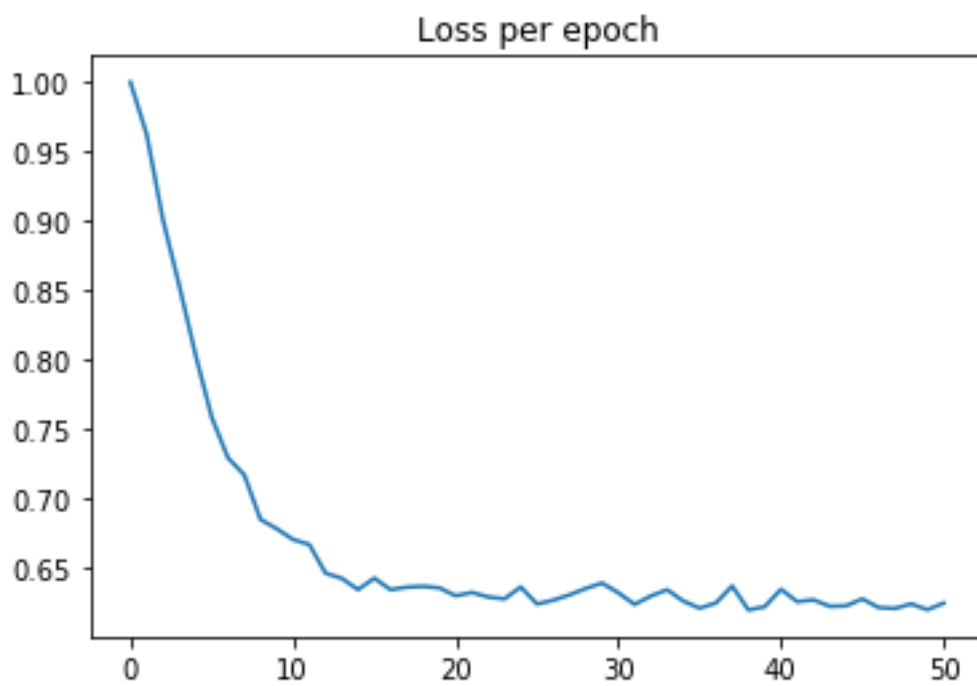
[ ]: # plot the losses of the training loop and save the figures
model.plot_losses(save=True)

```

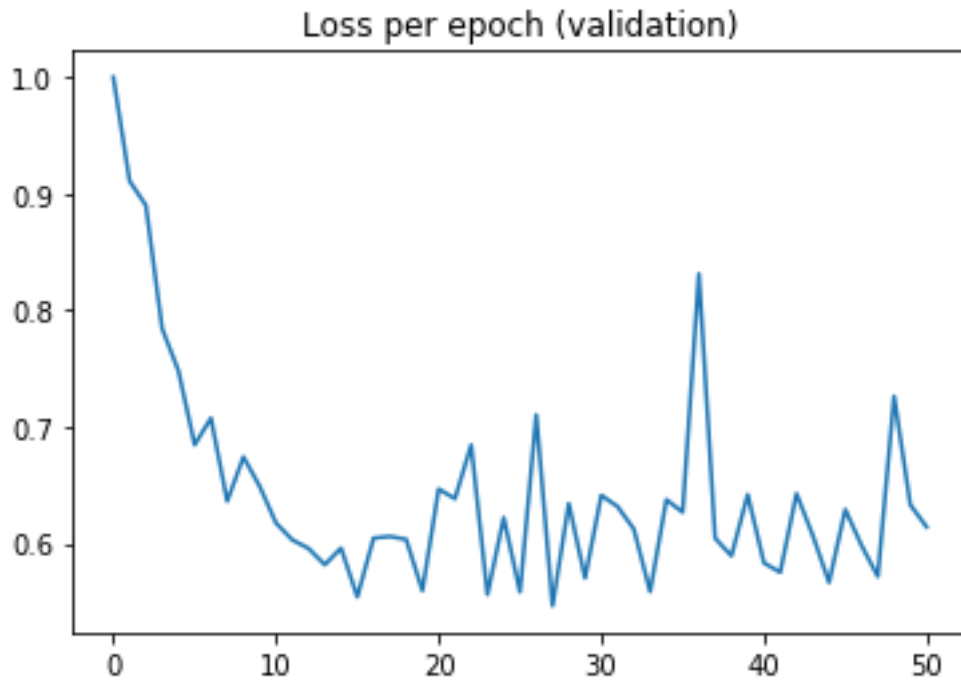
Saved in: peptide-QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_losses_batches_1.png



Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_losses_epoch_1.png

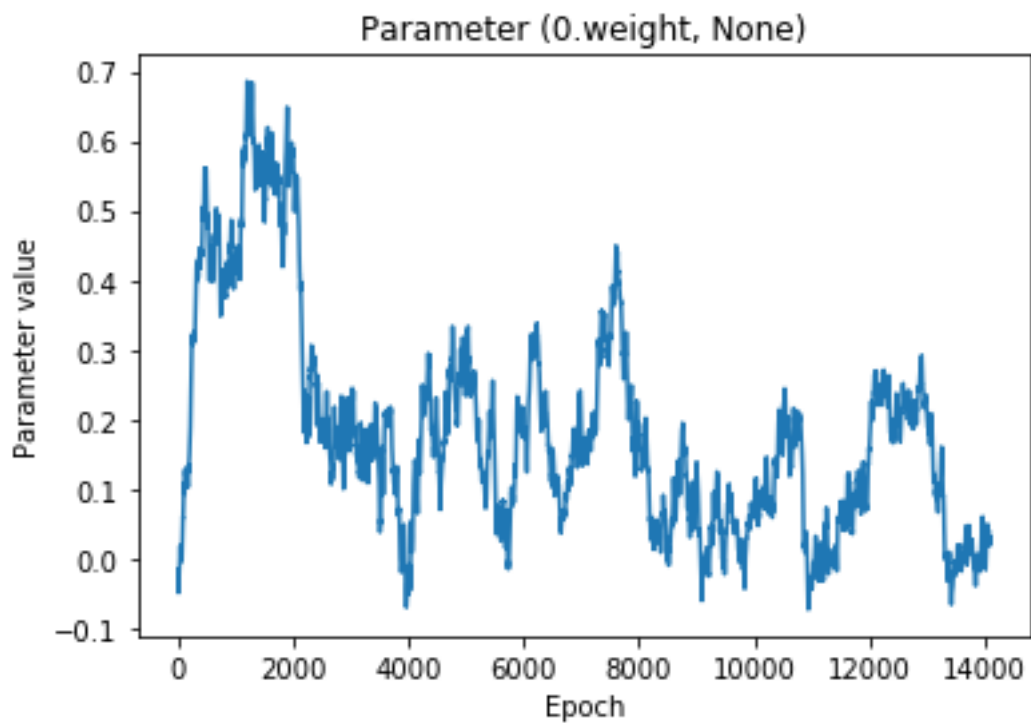


Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_losses_epoch_validation_1.png

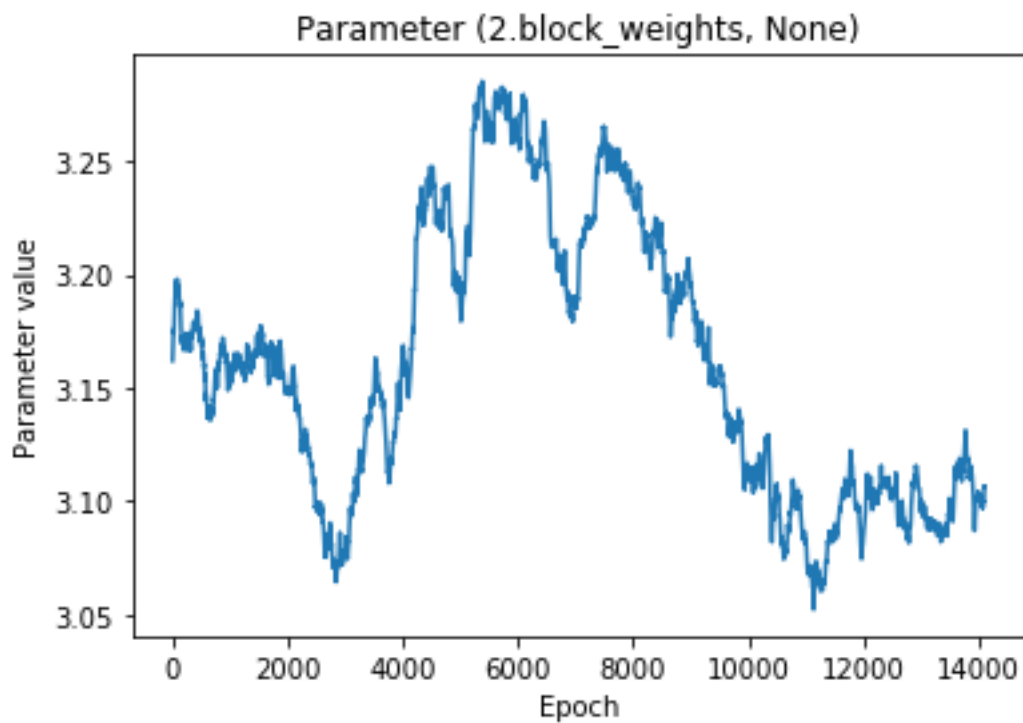


```
[ ]: # plot how the average of the parameters in each layer changes over time, and
      ↪ save that
for layer in model.model.state_dict().keys():
    model.plot_parameter(layer=layer, save=True)
```

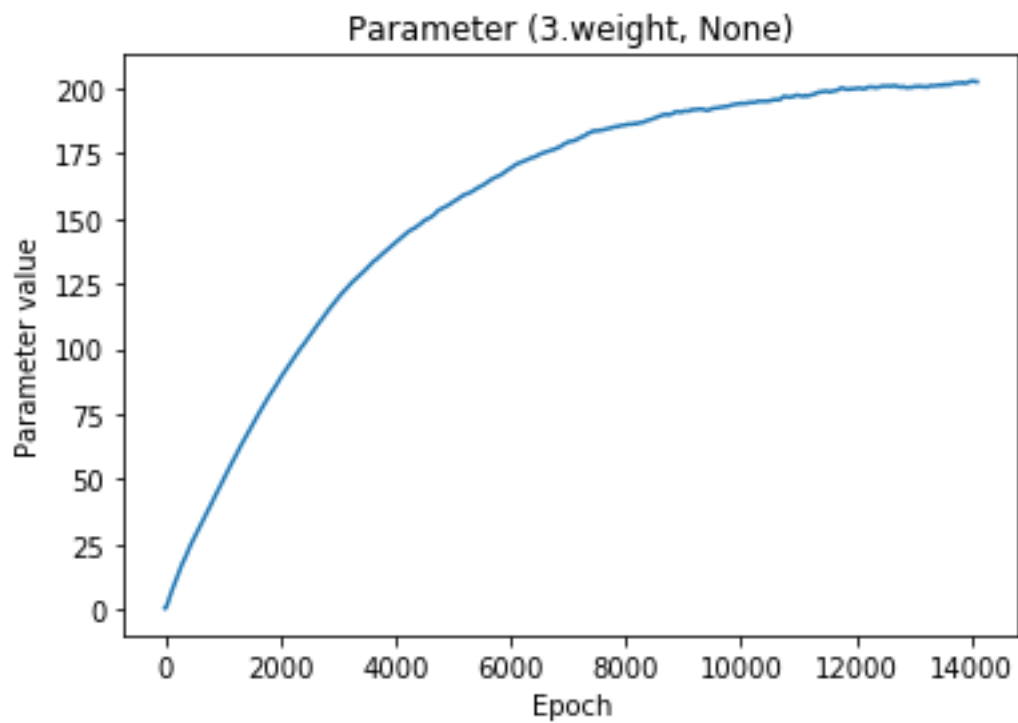
Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_parameter_0.weight_None_1.png



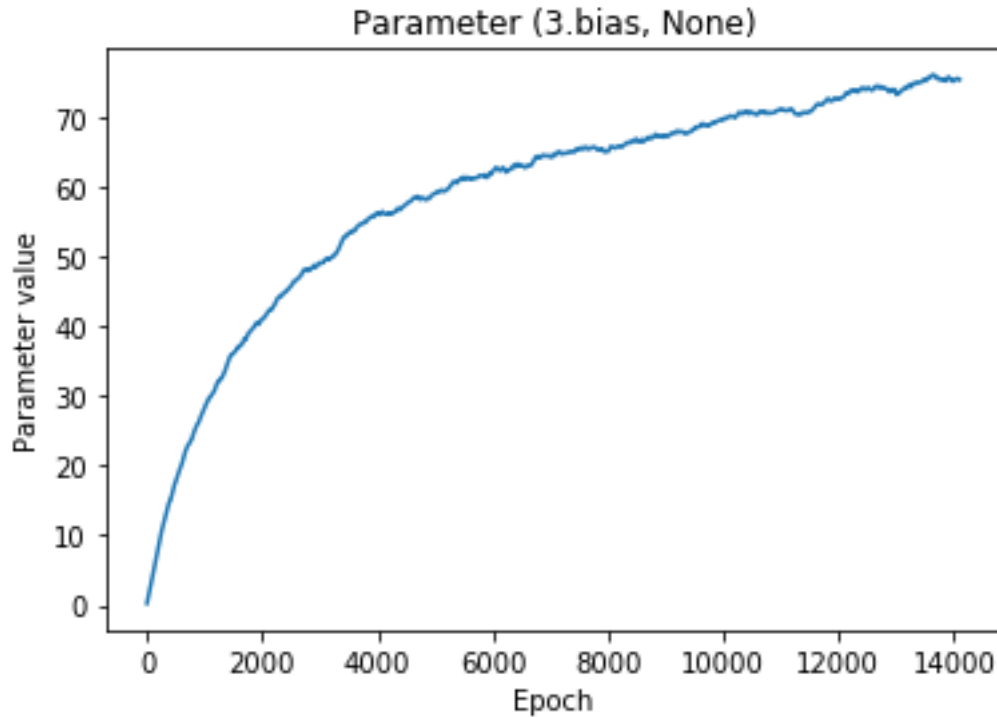
Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_parameter_2.block_weights_None_1.png



Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_parameter_3.weight_None_1.png



Saved in: peptide-
QML/checkpoints/0809/plots/0809-sh_e_1qm_v2_parameter_3.bias_None_1.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/0809/models/0809-sh_e_1qm_v2_1.pth

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

i: 0,	target: 169.8080,	output: 198.1978,	loss: 0.1672
i: 1,	target: -52.7040,	output: -29.7698,	loss: 0.4352
i: 2,	target: -74.2360,	output: -33.0750,	loss: 0.5545
i: 3,	target: 213.0630,	output: 208.4830,	loss: 0.0215
i: 4,	target: 140.6040,	output: 192.3190,	loss: 0.3678
i: 5,	target: -71.6000,	output: -37.6350,	loss: 0.4744
i: 6,	target: -19.1950,	output: -55.6193,	loss: 1.8976
i: 7,	target: 221.6500,	output: 150.1072,	loss: 0.3228
i: 8,	target: 135.8860,	output: 145.3873,	loss: 0.0699
i: 9,	target: 101.6440,	output: 142.1937,	loss: 0.3989
i: 10,	target: 227.1110,	output: -34.2547,	loss: 1.1508
i: 11,	target: 132.7560,	output: 184.6843,	loss: 0.3912
i: 12,	target: -86.8630,	output: -71.2279,	loss: 0.1800

i: 13,	target: 32.7150,	output: 8.8555,	loss: 0.7293
i: 14,	target: -20.3410,	output: -63.7713,	loss: 2.1351
i: 15,	target: -61.1210,	output: -40.9435,	loss: 0.3301
i: 16,	target: 140.0050,	output: 186.9458,	loss: 0.3353
i: 17,	target: -97.6970,	output: -59.7413,	loss: 0.3885
i: 18,	target: -13.0160,	output: -26.8318,	loss: 1.0615
i: 19,	target: 221.2620,	output: 201.3727,	loss: 0.0899
i: 20,	target: -89.3500,	output: -92.2134,	loss: 0.0320
i: 21,	target: -82.3970,	output: -62.5385,	loss: 0.2410
i: 22,	target: -83.5640,	output: -59.3734,	loss: 0.2895
i: 23,	target: -48.7370,	output: -93.3631,	loss: 0.9157
i: 24,	target: -39.5000,	output: -81.3418,	loss: 1.0593
i: 25,	target: -96.1660,	output: -60.2411,	loss: 0.3736
i: 26,	target: -101.1470,	output: -67.9651,	loss: 0.3281
i: 27,	target: 57.9990,	output: 139.9665,	loss: 1.4133
i: 28,	target: -52.9990,	output: -56.9181,	loss: 0.0739
i: 29,	target: -48.8170,	output: -8.0451,	loss: 0.8352
i: 30,	target: -63.1410,	output: -72.6897,	loss: 0.1512
i: 31,	target: -68.6900,	output: -56.4411,	loss: 0.1783
i: 32,	target: 179.3980,	output: 174.8424,	loss: 0.0254
i: 33,	target: 215.8670,	output: 222.3047,	loss: 0.0298
i: 34,	target: -71.2400,	output: -55.7657,	loss: 0.2172
i: 35,	target: 194.8990,	output: 214.6029,	loss: 0.1011
i: 36,	target: -74.3880,	output: -59.3171,	loss: 0.2026
i: 37,	target: -63.7470,	output: -34.4790,	loss: 0.4591
i: 38,	target: 117.2110,	output: 186.1908,	loss: 0.5885
i: 39,	target: 214.8070,	output: 147.4542,	loss: 0.3136
i: 40,	target: 32.8980,	output: 57.1395,	loss: 0.7369
i: 41,	target: 49.0420,	output: -48.2118,	loss: 1.9831
i: 42,	target: -60.6220,	output: -40.9486,	loss: 0.3245
i: 43,	target: 4.9810,	output: 57.3622,	loss: 10.5162
i: 44,	target: -30.3340,	output: -50.5838,	loss: 0.6676
i: 45,	target: -79.8020,	output: -69.8100,	loss: 0.1252
i: 46,	target: -72.6240,	output: -52.9861,	loss: 0.2704
i: 47,	target: 117.1700,	output: 156.1824,	loss: 0.3330
i: 48,	target: -30.6310,	output: -27.9874,	loss: 0.0863
i: 49,	target: -70.7320,	output: -61.9762,	loss: 0.1238
i: 50,	target: -65.8730,	output: -54.5873,	loss: 0.1713
i: 51,	target: 139.3290,	output: 137.8293,	loss: 0.0108
i: 52,	target: 162.1850,	output: 209.6130,	loss: 0.2924
i: 53,	target: -8.6210,	output: -9.7472,	loss: 0.1306
i: 54,	target: -16.4830,	output: 74.0252,	loss: 5.4910
i: 55,	target: 113.5140,	output: 136.2578,	loss: 0.2004
i: 56,	target: -68.5820,	output: -34.4619,	loss: 0.4975
i: 57,	target: -17.2830,	output: 58.7387,	loss: 4.3986
i: 58,	target: 145.6810,	output: 179.8337,	loss: 0.2344
i: 59,	target: 92.6010,	output: 133.4865,	loss: 0.4415
i: 60,	target: 305.2590,	output: 172.4335,	loss: 0.4351

i: 61,	target: -36.8180,	output: 3.5010,	loss: 1.0951
i: 62,	target: -71.3400,	output: -84.0730,	loss: 0.1785
i: 63,	target: -67.6170,	output: 14.6022,	loss: 1.2160
i: 64,	target: -58.9610,	output: -19.4100,	loss: 0.6708
i: 65,	target: 39.5290,	output: -12.7896,	loss: 1.3235
i: 66,	target: 209.1160,	output: 185.3632,	loss: 0.1136
i: 67,	target: -81.2960,	output: -50.8365,	loss: 0.3747
i: 68,	target: 139.1440,	output: 197.1464,	loss: 0.4169
i: 69,	target: -53.2750,	output: -42.6653,	loss: 0.1991
i: 70,	target: 195.2580,	output: 207.6537,	loss: 0.0635
i: 71,	target: -41.6800,	output: -65.2900,	loss: 0.5665
i: 72,	target: -46.6140,	output: 57.2811,	loss: 2.2288
i: 73,	target: -19.6620,	output: -34.9693,	loss: 0.7785
i: 74,	target: -98.9020,	output: -52.8889,	loss: 0.4652
i: 75,	target: -71.1370,	output: -63.4980,	loss: 0.1074
i: 76,	target: -53.2730,	output: -46.5520,	loss: 0.1262
i: 77,	target: 149.1460,	output: 87.5979,	loss: 0.4127
i: 78,	target: -96.8170,	output: -61.0588,	loss: 0.3693
i: 79,	target: -68.0360,	output: -50.0433,	loss: 0.2645
i: 80,	target: 36.4900,	output: 64.9543,	loss: 0.7801
i: 81,	target: 95.4360,	output: 100.8593,	loss: 0.0568
i: 82,	target: -80.0970,	output: -66.6711,	loss: 0.1676
i: 83,	target: -62.3930,	output: -46.2424,	loss: 0.2589
i: 84,	target: -18.9970,	output: -0.0423,	loss: 0.9978
i: 85,	target: -46.7740,	output: 33.7127,	loss: 1.7208
i: 86,	target: -62.6040,	output: -56.9377,	loss: 0.0905
i: 87,	target: 95.6960,	output: -3.4342,	loss: 1.0359
i: 88,	target: 44.5650,	output: -46.6944,	loss: 2.0478
i: 89,	target: -63.0150,	output: -69.4487,	loss: 0.1021
i: 90,	target: 223.5070,	output: 196.6711,	loss: 0.1201
i: 91,	target: -53.1940,	output: -86.4294,	loss: 0.6248
i: 92,	target: -75.9110,	output: -64.2835,	loss: 0.1532
i: 93,	target: -16.7990,	output: -70.9995,	loss: 3.2264
i: 94,	target: 96.7380,	output: 191.5561,	loss: 0.9802
i: 95,	target: -61.3310,	output: -48.3859,	loss: 0.2111
i: 96,	target: 42.9860,	output: 13.9626,	loss: 0.6752
i: 97,	target: -79.6790,	output: -61.3927,	loss: 0.2295
i: 98,	target: -74.4390,	output: -48.5307,	loss: 0.3480
i: 99,	target: 161.9860,	output: 189.8453,	loss: 0.1720
i: 100,	target: -28.5280,	output: 57.6555,	loss:
3.0210			
i: 101,	target: -97.1160,	output: -19.0387,	loss:
0.8040			
i: 102,	target: 51.2980,	output: 132.2803,	loss:
1.5787			
i: 103,	target: 86.4420,	output: 175.9300,	loss:
1.0352			
i: 104,	target: -76.6440,	output: -13.6338,	loss:

0.8221			
i: 105,	target: -82.8310,	output: -62.3834,	loss:
0.2469			
i: 106,	target: -42.5710,	output: -49.8829,	loss:
0.1718			
i: 107,	target: -86.3120,	output: -6.0781,	loss:
0.9296			
i: 108,	target: -57.4850,	output: -59.3466,	loss:
0.0324			
i: 109,	target: 188.2170,	output: 188.6964,	loss:
0.0025			
i: 110,	target: -81.3680,	output: -12.9337,	loss:
0.8410			
i: 111,	target: -74.7820,	output: -64.0625,	loss:
0.1433			
i: 112,	target: -32.3870,	output: 4.7147,	loss:
1.1456			
i: 113,	target: 29.2940,	output: 44.0912,	loss:
0.5051			
i: 114,	target: -34.7310,	output: -55.2480,	loss:
0.5907			
i: 115,	target: -52.6190,	output: -45.3898,	loss:
0.1374			
i: 116,	target: -72.4660,	output: -67.3018,	loss:
0.0713			
i: 117,	target: 245.6560,	output: -42.8265,	loss:
1.1743			
i: 118,	target: -100.1760,	output: -62.8024,	loss:
0.3731			
i: 119,	target: -52.8450,	output: 4.3349,	loss:
1.0820			
i: 120,	target: -81.6580,	output: 45.5829,	loss:
1.5582			
i: 121,	target: -49.2010,	output: -22.6859,	loss:
0.5389			
i: 122,	target: -86.3120,	output: -45.4694,	loss:
0.4732			
i: 123,	target: 39.4350,	output: 229.4741,	loss:
4.8190			
i: 124,	target: 51.4550,	output: 6.1429,	loss:
0.8806			
i: 125,	target: 26.6790,	output: 42.8319,	loss:
0.6055			
i: 126,	target: 123.6110,	output: 185.5430,	loss:
0.5010			
i: 127,	target: 142.6950,	output: 82.2576,	loss:
0.4235			
i: 128,	target: -108.6370,	output: -33.1744,	loss:

0.6946			
i: 129,	target: 66.3850,	output: 71.6376,	loss:
0.0791			
i: 130,	target: 110.3810,	output: 142.6898,	loss:
0.2927			
i: 131,	target: -55.9650,	output: -92.0859,	loss:
0.6454			
i: 132,	target: -90.5670,	output: -62.7580,	loss:
0.3071			
i: 133,	target: 70.2180,	output: 66.1889,	loss:
0.0574			
i: 134,	target: -80.0940,	output: -50.0419,	loss:
0.3752			
i: 135,	target: -67.3060,	output: -64.2364,	loss:
0.0456			
i: 136,	target: -51.0800,	output: -57.6891,	loss:
0.1294			
i: 137,	target: 103.4930,	output: 191.9848,	loss:
0.8551			
i: 138,	target: 87.2450,	output: 96.6259,	loss:
0.1075			
i: 139,	target: -57.9260,	output: -57.1643,	loss:
0.0131			
i: 140,	target: 44.3960,	output: 30.3101,	loss:
0.3173			
i: 141,	target: 194.9270,	output: 53.2724,	loss:
0.7267			
i: 142,	target: -81.3990,	output: -47.1758,	loss:
0.4204			
i: 143,	target: -66.2980,	output: -55.3553,	loss:
0.1651			
i: 144,	target: 38.2230,	output: -45.6532,	loss:
2.1944			
i: 145,	target: 162.6740,	output: 142.4873,	loss:
0.1241			
i: 146,	target: -31.8380,	output: -45.6480,	loss:
0.4338			
i: 147,	target: 305.0150,	output: -9.7003,	loss:
1.0318			
i: 148,	target: -114.4690,	output: -67.4875,	loss:
0.4104			
i: 149,	target: -57.6510,	output: -35.7030,	loss:
0.3807			
i: 150,	target: 33.6360,	output: -28.9529,	loss:
1.8608			
i: 151,	target: 327.1620,	output: 2.6489,	loss:
0.9919			
i: 152,	target: 246.0800,	output: 51.3606,	loss:

0.7913			
i: 153,	target: -31.7800,	output: -21.4941,	loss:
0.3237			
i: 154,	target: 12.3530,	output: -38.8203,	loss:
4.1426			
i: 155,	target: -87.3910,	output: -58.1843,	loss:
0.3342			
i: 156,	target: -49.7210,	output: 13.7156,	loss:
1.2759			
i: 157,	target: -72.8730,	output: -57.1746,	loss:
0.2154			
i: 158,	target: -108.4920,	output: -58.7193,	loss:
0.4588			
i: 159,	target: 181.0310,	output: 84.8165,	loss:
0.5315			
i: 160,	target: -71.3040,	output: -61.6434,	loss:
0.1355			
i: 161,	target: -87.1870,	output: -64.1630,	loss:
0.2641			
i: 162,	target: 175.9170,	output: 193.6990,	loss:
0.1011			
i: 163,	target: -59.4300,	output: -88.4808,	loss:
0.4888			
i: 164,	target: -80.5540,	output: -62.7040,	loss:
0.2216			
i: 165,	target: -3.0510,	output: -4.4807,	loss:
0.4686			
i: 166,	target: 291.0160,	output: -18.6753,	loss:
1.0642			
i: 167,	target: -36.5670,	output: -28.1855,	loss:
0.2292			
i: 168,	target: 173.7680,	output: 212.8580,	loss:
0.2250			
i: 169,	target: -69.1950,	output: -60.1675,	loss:
0.1305			
i: 170,	target: 20.6980,	output: 15.3402,	loss:
0.2589			
i: 171,	target: 25.0070,	output: -49.9181,	loss:
2.9962			
i: 172,	target: 90.5570,	output: 112.0912,	loss:
0.2378			
i: 173,	target: -78.6680,	output: -62.2669,	loss:
0.2085			
i: 174,	target: -56.4060,	output: -59.8921,	loss:
0.0618			
i: 175,	target: -44.2140,	output: -32.6930,	loss:
0.2606			
i: 176,	target: 207.0170,	output: 54.6728,	loss:

0.7359			
i: 177,	target: 1.7710,	output: -6.3936,	loss:
4.6102			
i: 178,	target: -57.9160,	output: -29.6789,	loss:
0.4876			
i: 179,	target: 154.8910,	output: 84.2742,	loss:
0.4559			
i: 180,	target: 177.8090,	output: 213.0539,	loss:
0.1982			
i: 181,	target: 14.2250,	output: 16.6056,	loss:
0.1674			
i: 182,	target: 218.1370,	output: 82.4632,	loss:
0.6220			
i: 183,	target: -83.1950,	output: -13.0972,	loss:
0.8426			
i: 184,	target: 14.9900,	output: 65.4766,	loss:
3.3680			
i: 185,	target: 145.8220,	output: 187.8925,	loss:
0.2885			
i: 186,	target: -101.8830,	output: 66.9980,	loss:
1.6576			
i: 187,	target: -36.7790,	output: -27.9059,	loss:
0.2413			
i: 188,	target: 185.5060,	output: 128.7378,	loss:
0.3060			
i: 189,	target: -88.4700,	output: -59.9574,	loss:
0.3223			
i: 190,	target: -95.2470,	output: -69.6691,	loss:
0.2685			
i: 191,	target: -40.4160,	output: -44.8248,	loss:
0.1091			
i: 192,	target: -83.0370,	output: -45.4141,	loss:
0.4531			
i: 193,	target: 39.9280,	output: -24.7230,	loss:
1.6192			
i: 194,	target: 192.6290,	output: 2.5272,	loss:
0.9869			
i: 195,	target: -47.6110,	output: -54.5231,	loss:
0.1452			
i: 196,	target: 327.6940,	output: -12.4260,	loss:
1.0379			
i: 197,	target: 197.9290,	output: 118.1621,	loss:
0.4030			
i: 198,	target: -74.4460,	output: -28.4329,	loss:
0.6181			
i: 199,	target: 187.1730,	output: 150.8660,	loss:
0.1940			
i: 200,	target: -77.3500,	output: -27.5753,	loss:

0.6435			
i: 201,	target: 100.1670,	output: 184.3399,	loss:
0.8403			
i: 202,	target: 122.2670,	output: 131.6312,	loss:
0.0766			
i: 203,	target: -81.1280,	output: -45.2366,	loss:
0.4424			
i: 204,	target: -43.1500,	output: -1.4248,	loss:
0.9670			
i: 205,	target: -52.5300,	output: -27.4341,	loss:
0.4777			
i: 206,	target: 191.0760,	output: 187.9000,	loss:
0.0166			
i: 207,	target: -68.5370,	output: -89.2870,	loss:
0.3028			
i: 208,	target: -74.5580,	output: -85.0168,	loss:
0.1403			
i: 209,	target: -78.3770,	output: -5.6407,	loss:
0.9280			
i: 210,	target: 144.0260,	output: 35.4780,	loss:
0.7537			
i: 211,	target: 234.3380,	output: 181.7662,	loss:
0.2243			
i: 212,	target: 93.7030,	output: 171.1495,	loss:
0.8265			
i: 213,	target: 140.6810,	output: 174.3112,	loss:
0.2391			
i: 214,	target: 203.3740,	output: 134.8741,	loss:
0.3368			
i: 215,	target: -80.2500,	output: -34.2336,	loss:
0.5734			
i: 216,	target: -70.8000,	output: -85.8868,	loss:
0.2131			
i: 217,	target: -56.7020,	output: 6.6003,	loss:
1.1164			
i: 218,	target: -46.8670,	output: -73.2216,	loss:
0.5623			
i: 219,	target: 175.7530,	output: 209.7655,	loss:
0.1935			
i: 220,	target: 216.6280,	output: 52.5485,	loss:
0.7574			
i: 221,	target: 89.4850,	output: 150.6136,	loss:
0.6831			
i: 222,	target: -71.1310,	output: -29.8957,	loss:
0.5797			
i: 223,	target: -55.9730,	output: -34.5864,	loss:
0.3821			
i: 224,	target: 206.4430,	output: 53.9669,	loss:

0.7386			
i: 225,	target: 72.1240,	output: 34.1781,	loss:
0.5261			
i: 226,	target: -51.6390,	output: -51.9298,	loss:
0.0056			
i: 227,	target: 226.7530,	output: 29.7777,	loss:
0.8687			
i: 228,	target: -43.1440,	output: -28.9791,	loss:
0.3283			
i: 229,	target: -26.9100,	output: -44.4820,	loss:
0.6530			
i: 230,	target: 177.5000,	output: 192.2629,	loss:
0.0832			
i: 231,	target: 191.9740,	output: 165.2235,	loss:
0.1393			
i: 232,	target: -78.2890,	output: -10.2193,	loss:
0.8695			
i: 233,	target: -59.5540,	output: -59.0240,	loss:
0.0089			
i: 234,	target: 86.0730,	output: 175.4238,	loss:
1.0381			
i: 235,	target: 128.3910,	output: 190.8862,	loss:
0.4868			
i: 236,	target: 230.3890,	output: 220.0609,	loss:
0.0448			
i: 237,	target: -74.8740,	output: -59.8198,	loss:
0.2011			
i: 238,	target: -70.5550,	output: -52.7366,	loss:
0.2525			
i: 239,	target: 61.1730,	output: 44.8988,	loss:
0.2660			
i: 240,	target: 129.1500,	output: 5.4892,	loss:
0.9575			
i: 241,	target: -18.1960,	output: -30.3360,	loss:
0.6672			
i: 242,	target: 2.7380,	output: 58.4953,	loss:
20.3642			
i: 243,	target: 97.5150,	output: 160.5880,	loss:
0.6468			
i: 244,	target: -67.3980,	output: -67.6914,	loss:
0.0044			
i: 245,	target: 4.9200,	output: -0.9665,	loss:
1.1964			
i: 246,	target: -69.3470,	output: -60.8218,	loss:
0.1229			
i: 247,	target: -18.7670,	output: -19.6474,	loss:
0.0469			
i: 248,	target: 240.2550,	output: -22.4627,	loss:

1.0935			
i: 249,	target: -86.1330,	output: -29.9665,	loss:
0.6521			
i: 250,	target: -55.4580,	output: 11.8654,	loss:
1.2140			
i: 251,	target: 177.6510,	output: 153.6902,	loss:
0.1349			
i: 252,	target: -61.5700,	output: -6.1896,	loss:
0.8995			
i: 253,	target: 170.6550,	output: 171.0846,	loss:
0.0025			
i: 254,	target: 160.0070,	output: 196.3615,	loss:
0.2272			
i: 255,	target: 190.4240,	output: 174.5792,	loss:
0.0832			
i: 256,	target: 484.5010,	output: 217.5068,	loss:
0.5511			
i: 257,	target: -89.4220,	output: 65.2193,	loss:
1.7293			
i: 258,	target: -75.6810,	output: -39.8645,	loss:
0.4733			
i: 259,	target: 37.0630,	output: 74.6908,	loss:
1.0152			
i: 260,	target: -32.2610,	output: -54.1508,	loss:
0.6785			
i: 261,	target: 36.9260,	output: -43.9505,	loss:
2.1902			
i: 262,	target: -23.0260,	output: 33.7929,	loss:
2.4676			
i: 263,	target: -65.5200,	output: -49.9892,	loss:
0.2370			
i: 264,	target: 311.1930,	output: 93.0174,	loss:
0.7011			
i: 265,	target: -109.8100,	output: -59.0088,	loss:
0.4626			
i: 266,	target: 6.0320,	output: 3.0472,	loss:
0.4948			
i: 267,	target: -17.5000,	output: -31.5517,	loss:
0.8030			
i: 268,	target: 169.6460,	output: 190.3284,	loss:
0.1219			
i: 269,	target: -69.7610,	output: -20.0803,	loss:
0.7122			
i: 270,	target: 166.7920,	output: 224.2254,	loss:
0.3443			
i: 271,	target: 234.9060,	output: -48.8645,	loss:
1.2080			
i: 272,	target: -103.8910,	output: -64.2249,	loss:

0.3818			
i: 273,	target: 91.6250,	output: 140.3905,	loss:
0.5322			
i: 274,	target: -50.1650,	output: -89.7176,	loss:
0.7885			
i: 275,	target: -69.9860,	output: -57.4041,	loss:
0.1798			
i: 276,	target: -66.2370,	output: -61.4847,	loss:
0.0717			
i: 277,	target: 213.2000,	output: 113.5985,	loss:
0.4672			
i: 278,	target: -47.5810,	output: 1.4224,	loss:
1.0299			
i: 279,	target: -55.6630,	output: -62.3125,	loss:
0.1195			
i: 280,	target: -58.7770,	output: -24.3245,	loss:
0.5862			
i: 281,	target: 159.5830,	output: 142.0982,	loss:
0.1096			
i: 282,	target: -30.5910,	output: -68.5840,	loss:
1.2420			
i: 283,	target: -68.2980,	output: -43.3628,	loss:
0.3651			
i: 284,	target: 37.9050,	output: -83.7670,	loss:
3.2099			
i: 285,	target: -35.1990,	output: -65.4746,	loss:
0.8601			
i: 286,	target: 3.4470,	output: -11.8542,	loss:
4.4390			
i: 287,	target: -72.5380,	output: -59.5850,	loss:
0.1786			
i: 288,	target: 160.9510,	output: 128.4077,	loss:
0.2022			
i: 289,	target: -55.1550,	output: -61.5768,	loss:
0.1164			
i: 290,	target: -72.0920,	output: -44.8043,	loss:
0.3785			
i: 291,	target: 175.2310,	output: 175.3194,	loss:
0.0005			
i: 292,	target: -78.8240,	output: -84.9407,	loss:
0.0776			
i: 293,	target: -16.3930,	output: 3.2189,	loss:
1.1964			
i: 294,	target: 184.8130,	output: 196.9497,	loss:
0.0657			
i: 295,	target: 189.1060,	output: -35.7157,	loss:
1.1889			
i: 296,	target: -80.1290,	output: -31.2422,	loss:

0.6101			
i: 297,	target: 45.5910,	output: -57.8331,	loss:
2.2685			
i: 298,	target: -55.8560,	output: -49.7006,	loss:
0.1102			
i: 299,	target: -65.1780,	output: -44.4507,	loss:
0.3180			
i: 300,	target: -98.4020,	output: -68.2616,	loss:
0.3063			
i: 301,	target: 62.0270,	output: 26.1891,	loss:
0.5778			
i: 302,	target: 130.6000,	output: 64.4896,	loss:
0.5062			
i: 303,	target: 60.6640,	output: 135.3190,	loss:
1.2306			
i: 304,	target: -76.5540,	output: -65.8737,	loss:
0.1395			
i: 305,	target: 354.6880,	output: 57.8153,	loss:
0.8370			
i: 306,	target: 123.9810,	output: 78.2846,	loss:
0.3686			
i: 307,	target: -54.0390,	output: -65.1999,	loss:
0.2065			
i: 308,	target: -48.3990,	output: 2.7241,	loss:
1.0563			
i: 309,	target: 195.8570,	output: 220.5389,	loss:
0.1260			
i: 310,	target: 233.9420,	output: 184.1716,	loss:
0.2127			
i: 311,	target: -52.4900,	output: 127.0041,	loss:
3.4196			
i: 312,	target: 253.5370,	output: -8.7209,	loss:
1.0344			
i: 313,	target: -32.4500,	output: -55.5533,	loss:
0.7120			
i: 314,	target: -72.1720,	output: -53.5904,	loss:
0.2575			
i: 315,	target: 34.2760,	output: 157.6205,	loss:
3.5986			
i: 316,	target: -67.7240,	output: -21.0040,	loss:
0.6899			
i: 317,	target: 99.9890,	output: 193.3821,	loss:
0.9340			
i: 318,	target: 346.9670,	output: -37.8669,	loss:
1.1091			
i: 319,	target: 196.7760,	output: 210.1055,	loss:
0.0677			
i: 320,	target: -100.3580,	output: -63.9779,	loss:

0.3625			
i: 321,	target: 293.4190,	output: 209.3138,	loss:
0.2866			
i: 322,	target: 163.4190,	output: 229.5550,	loss:
0.4047			
i: 323,	target: -69.0240,	output: -52.5446,	loss:
0.2387			
i: 324,	target: 96.4940,	output: 176.5308,	loss:
0.8294			
i: 325,	target: -71.7930,	output: -48.8925,	loss:
0.3190			
i: 326,	target: -80.7960,	output: -64.2706,	loss:
0.2045			
i: 327,	target: 48.5360,	output: 142.3568,	loss:
1.9330			
i: 328,	target: -71.5450,	output: -56.4124,	loss:
0.2115			
i: 329,	target: 42.4570,	output: 50.6136,	loss:
0.1921			
i: 330,	target: -73.6200,	output: -57.9073,	loss:
0.2134			
i: 331,	target: 226.6530,	output: -61.5872,	loss:
1.2717			
i: 332,	target: 145.8890,	output: 136.9848,	loss:
0.0610			
i: 333,	target: -68.4480,	output: -84.6651,	loss:
0.2369			
i: 334,	target: -55.9170,	output: -67.5685,	loss:
0.2084			
i: 335,	target: 110.8360,	output: 114.8217,	loss:
0.0360			
i: 336,	target: 195.2250,	output: 19.8222,	loss:
0.8985			
i: 337,	target: 217.9570,	output: 51.1306,	loss:
0.7654			
i: 338,	target: 212.6390,	output: 209.9150,	loss:
0.0128			
i: 339,	target: -95.0200,	output: -29.0805,	loss:
0.6940			
i: 340,	target: -36.8330,	output: 123.2044,	loss:
4.3449			
i: 341,	target: -54.5040,	output: -68.9111,	loss:
0.2643			
i: 342,	target: -25.3100,	output: 35.6934,	loss:
2.4102			
i: 343,	target: -70.0290,	output: 26.2482,	loss:
1.3748			
i: 344,	target: -78.0700,	output: -42.1994,	loss:

0.4595			
i: 345,	target: 153.7130,	output: 155.8395,	loss:
0.0138			
i: 346,	target: -14.0070,	output: 20.6799,	loss:
2.4764			
i: 347,	target: 244.8770,	output: 177.0417,	loss:
0.2770			
i: 348,	target: 194.1900,	output: 137.4843,	loss:
0.2920			
i: 349,	target: 250.2320,	output: -29.4914,	loss:
1.1179			
i: 350,	target: 96.1500,	output: 173.5861,	loss:
0.8054			
i: 351,	target: 79.2200,	output: 38.7558,	loss:
0.5108			
i: 352,	target: 39.0180,	output: -47.9329,	loss:
2.2285			
i: 353,	target: -53.7000,	output: -31.9532,	loss:
0.4050			
i: 354,	target: 100.3710,	output: 129.6399,	loss:
0.2916			
i: 355,	target: -57.2220,	output: -49.8162,	loss:
0.1294			
i: 356,	target: -82.2240,	output: -88.8391,	loss:
0.0805			
i: 357,	target: 198.4440,	output: 43.4503,	loss:
0.7810			
i: 358,	target: 137.5400,	output: 207.6278,	loss:
0.5096			
i: 359,	target: -38.8860,	output: -57.8472,	loss:
0.4876			
i: 360,	target: 170.3880,	output: 205.0416,	loss:
0.2034			
i: 361,	target: 9.2630,	output: 47.4705,	loss:
4.1247			
i: 362,	target: 89.9920,	output: 174.8436,	loss:
0.9429			
i: 363,	target: 135.1870,	output: 155.4276,	loss:
0.1497			
i: 364,	target: -70.9550,	output: -56.0492,	loss:
0.2101			
i: 365,	target: 94.3930,	output: 194.9479,	loss:
1.0653			
i: 366,	target: -0.7320,	output: -19.4786,	loss:
25.6100			
i: 367,	target: 86.5800,	output: 193.4798,	loss:
1.2347			
i: 368,	target: -28.4970,	output: 84.2812,	loss:

3.9575			
i: 369,	target: -86.0650,	output: -64.1714,	loss:
0.2544			
i: 370,	target: -84.5080,	output: -15.3430,	loss:
0.8184			
i: 371,	target: -21.2460,	output: -58.5436,	loss:
1.7555			
i: 372,	target: -69.9060,	output: -61.7939,	loss:
0.1160			
i: 373,	target: 159.3310,	output: 39.9199,	loss:
0.7495			
i: 374,	target: 194.3770,	output: 142.8153,	loss:
0.2653			
i: 375,	target: -72.9550,	output: -69.1883,	loss:
0.0516			
i: 376,	target: 169.7450,	output: 208.4751,	loss:
0.2282			
i: 377,	target: 114.2620,	output: 205.9787,	loss:
0.8027			
i: 378,	target: -66.0360,	output: -37.2160,	loss:
0.4364			
i: 379,	target: 172.1060,	output: 126.6352,	loss:
0.2642			
i: 380,	target: -59.4370,	output: -34.3459,	loss:
0.4221			
i: 381,	target: 135.0240,	output: 149.1260,	loss:
0.1044			
i: 382,	target: -74.7260,	output: -69.0502,	loss:
0.0760			
i: 383,	target: -75.9420,	output: -67.4921,	loss:
0.1113			
i: 384,	target: -79.7780,	output: -62.9957,	loss:
0.2104			
i: 385,	target: -33.8110,	output: 16.5340,	loss:
1.4890			
i: 386,	target: -71.9910,	output: 9.3813,	loss:
1.1303			
i: 387,	target: -80.8490,	output: -51.1714,	loss:
0.3671			
i: 388,	target: 95.1370,	output: 131.3561,	loss:
0.3807			
i: 389,	target: -50.5530,	output: -58.8151,	loss:
0.1634			
i: 390,	target: -74.4630,	output: -65.6587,	loss:
0.1182			
i: 391,	target: 172.7450,	output: 194.3232,	loss:
0.1249			
i: 392,	target: -101.2670,	output: -12.6248,	loss:

0.8753			
i: 393,	target: -54.8470,	output: -42.3906,	loss:
0.2271			
i: 394,	target: 174.4730,	output: 220.4147,	loss:
0.2633			
i: 395,	target: 26.3370,	output: 50.5038,	loss:
0.9176			
i: 396,	target: 304.8310,	output: 166.0702,	loss:
0.4552			
i: 397,	target: 44.7000,	output: 17.9137,	loss:
0.5992			
i: 398,	target: -87.7340,	output: -26.7613,	loss:
0.6950			
i: 399,	target: 216.9750,	output: 219.8984,	loss:
0.0135			
i: 400,	target: -47.7670,	output: -58.4043,	loss:
0.2227			
i: 401,	target: 163.0990,	output: 88.0344,	loss:
0.4602			
i: 402,	target: -40.2120,	output: -92.8910,	loss:
1.3100			
i: 403,	target: -48.5450,	output: -42.7467,	loss:
0.1194			
i: 404,	target: 204.2850,	output: 182.8589,	loss:
0.1049			
i: 405,	target: -67.3900,	output: -62.0258,	loss:
0.0796			
i: 406,	target: -73.1380,	output: -54.9210,	loss:
0.2491			
i: 407,	target: -64.3700,	output: 6.9237,	loss:
1.1076			
i: 408,	target: 168.9800,	output: 207.9625,	loss:
0.2307			
i: 409,	target: 90.4310,	output: 31.5246,	loss:
0.6514			
i: 410,	target: -75.8280,	output: -36.2223,	loss:
0.5223			
i: 411,	target: -48.0110,	output: -56.2500,	loss:
0.1716			
i: 412,	target: -91.0230,	output: -64.3130,	loss:
0.2934			
i: 413,	target: 257.9690,	output: 77.6720,	loss:
0.6989			
i: 414,	target: 98.9310,	output: -21.9898,	loss:
1.2223			
i: 415,	target: 19.0460,	output: -52.8311,	loss:
3.7739			
i: 416,	target: -66.0710,	output: -54.3554,	loss:

0.1773			
i: 417,	target: 16.1420,	output: 16.2826,	loss:
0.0087			
i: 418,	target: -65.4800,	output: -91.7706,	loss:
0.4015			
i: 419,	target: -59.9180,	output: -68.2380,	loss:
0.1389			
i: 420,	target: -62.8230,	output: 41.2204,	loss:
1.6561			
i: 421,	target: 185.9210,	output: 191.6137,	loss:
0.0306			
i: 422,	target: -68.9530,	output: -65.1926,	loss:
0.0545			
i: 423,	target: -48.2620,	output: 31.3072,	loss:
1.6487			
i: 424,	target: -69.9580,	output: -30.6034,	loss:
0.5625			
i: 425,	target: -92.8190,	output: -41.0845,	loss:
0.5574			
i: 426,	target: 59.5270,	output: -50.4007,	loss:
1.8467			
i: 427,	target: -101.1320,	output: -90.5300,	loss:
0.1048			
i: 428,	target: -87.3960,	output: -44.9535,	loss:
0.4856			
i: 429,	target: -43.6540,	output: -82.1303,	loss:
0.8814			
i: 430,	target: -40.0100,	output: -30.2197,	loss:
0.2447			
i: 431,	target: -36.2710,	output: 41.7696,	loss:
2.1516			
i: 432,	target: -61.6440,	output: -67.6313,	loss:
0.0971			
i: 433,	target: 44.4060,	output: 16.3331,	loss:
0.6322			
i: 434,	target: -44.2640,	output: -24.2006,	loss:
0.4533			
i: 435,	target: -61.1010,	output: -12.0924,	loss:
0.8021			
i: 436,	target: 327.6830,	output: 31.0824,	loss:
0.9051			
i: 437,	target: -109.6150,	output: -56.2414,	loss:
0.4869			
i: 438,	target: -64.6870,	output: -73.8854,	loss:
0.1422			
i: 439,	target: 222.7900,	output: 207.3743,	loss:
0.0692			
i: 440,	target: 206.6730,	output: 35.9258,	loss:

0.8262			
i: 441,	target: -58.6010,	output: 12.7103,	loss:
1.2169			
i: 442,	target: 152.7790,	output: 178.0288,	loss:
0.1653			
i: 443,	target: -53.8330,	output: -95.3963,	loss:
0.7721			
i: 444,	target: -77.0480,	output: -63.5259,	loss:
0.1755			
i: 445,	target: 170.0950,	output: 202.1112,	loss:
0.1882			
i: 446,	target: 189.2520,	output: 207.4895,	loss:
0.0964			
i: 447,	target: 141.3390,	output: 202.4552,	loss:
0.4324			
i: 448,	target: 31.2610,	output: 53.6110,	loss:
0.7149			
i: 449,	target: 38.0800,	output: -61.3334,	loss:
2.6106			
i: 450,	target: -74.2260,	output: -56.8419,	loss:
0.2342			
i: 451,	target: -101.7070,	output: -11.2979,	loss:
0.8889			
i: 452,	target: -72.2080,	output: -75.8467,	loss:
0.0504			
i: 453,	target: 335.7470,	output: -14.6325,	loss:
1.0436			
i: 454,	target: -21.2210,	output: -31.2016,	loss:
0.4703			
i: 455,	target: 313.3110,	output: 58.6344,	loss:
0.8129			
i: 456,	target: -66.7540,	output: -33.4851,	loss:
0.4984			
i: 457,	target: -87.2340,	output: -41.9844,	loss:
0.5187			
i: 458,	target: 143.5980,	output: 204.0007,	loss:
0.4206			
i: 459,	target: -54.9580,	output: -47.5982,	loss:
0.1339			
i: 460,	target: -89.3180,	output: -31.0324,	loss:
0.6526			
i: 461,	target: -62.6420,	output: -56.2691,	loss:
0.1017			
i: 462,	target: -73.6980,	output: -61.8183,	loss:
0.1612			
i: 463,	target: 96.4200,	output: 158.3783,	loss:
0.6426			
i: 464,	target: 471.5580,	output: 246.4772,	loss:

0.4773			
i: 465,	target: 476.7050,	output: 177.7823,	loss:
0.6271			
i: 466,	target: -25.7460,	output: -32.7337,	loss:
0.2714			
i: 467,	target: -43.1860,	output: -54.9852,	loss:
0.2732			
i: 468,	target: 135.7210,	output: -1.0514,	loss:
1.0077			
i: 469,	target: 63.1190,	output: 77.3635,	loss:
0.2257			
i: 470,	target: -74.8060,	output: -55.3965,	loss:
0.2595			
i: 471,	target: -95.4660,	output: -61.0919,	loss:
0.3601			
i: 472,	target: -29.6720,	output: 27.2100,	loss:
1.9170			
i: 473,	target: 476.2500,	output: 232.7871,	loss:
0.5112			
i: 474,	target: 139.2560,	output: 199.4465,	loss:
0.4322			
i: 475,	target: -33.1680,	output: -21.4357,	loss:
0.3537			
i: 476,	target: -36.5310,	output: -43.9542,	loss:
0.2032			
i: 477,	target: 603.8990,	output: 198.7750,	loss:
0.6708			
i: 478,	target: -76.7860,	output: -63.0384,	loss:
0.1790			
i: 479,	target: -70.5460,	output: -50.2805,	loss:
0.2873			
i: 480,	target: -57.5470,	output: -91.3894,	loss:
0.5881			
i: 481,	target: -79.4220,	output: -50.7215,	loss:
0.3614			
i: 482,	target: -86.4270,	output: -13.2805,	loss:
0.8463			
i: 483,	target: -48.9140,	output: 47.6502,	loss:
1.9742			
i: 484,	target: -79.1360,	output: -36.0010,	loss:
0.5451			
i: 485,	target: 93.3190,	output: -4.1134,	loss:
1.0441			
i: 486,	target: -75.1970,	output: -36.5743,	loss:
0.5136			
i: 487,	target: -47.9140,	output: -67.3010,	loss:
0.4046			
i: 488,	target: -64.2190,	output: -64.0781,	loss:

0.0022			
i: 489,	target: -32.3630,	output: 54.8450,	loss:
2.6947			
i: 490,	target: 200.8050,	output: 239.5551,	loss:
0.1930			
i: 491,	target: -64.0620,	output: -2.5856,	loss:
0.9596			
i: 492,	target: -84.8170,	output: -91.6734,	loss:
0.0808			
i: 493,	target: 41.8200,	output: 29.1006,	loss:
0.3041			
i: 494,	target: 221.4800,	output: 61.6433,	loss:
0.7217			
i: 495,	target: 170.8200,	output: 205.0686,	loss:
0.2005			
i: 496,	target: -57.6630,	output: -53.5530,	loss:
0.0713			
i: 497,	target: 228.1440,	output: -74.8915,	loss:
1.3283			
i: 498,	target: -58.4700,	output: -58.1121,	loss:
0.0061			
i: 499,	target: -52.4900,	output: 127.0041,	loss:
3.4196			
i: 500,	target: -55.8700,	output: 86.2370,	loss:
2.5435			
i: 501,	target: -70.7030,	output: -66.3118,	loss:
0.0621			
i: 502,	target: 451.5220,	output: 195.2155,	loss:
0.5676			
i: 503,	target: 180.1300,	output: 187.2603,	loss:
0.0396			
i: 504,	target: -68.6640,	output: -72.3461,	loss:
0.0536			
i: 505,	target: 226.6380,	output: 52.1050,	loss:
0.7701			
i: 506,	target: 136.3920,	output: 112.7514,	loss:
0.1733			
i: 507,	target: -72.6150,	output: -60.9023,	loss:
0.1613			
i: 508,	target: 164.0400,	output: 143.0369,	loss:
0.1280			
i: 509,	target: -58.1430,	output: -53.3792,	loss:
0.0819			
i: 510,	target: 130.7280,	output: 179.0253,	loss:
0.3694			
i: 511,	target: -76.4970,	output: -27.8508,	loss:
0.6359			
i: 512,	target: 232.9490,	output: 175.7097,	loss:

0.2457			
i: 513,	target: -54.2750,	output: -71.6276,	loss:
0.3197			
i: 514,	target: -45.3870,	output: -48.0995,	loss:
0.0598			
i: 515,	target: 201.0060,	output: 147.8172,	loss:
0.2646			
i: 516,	target: -72.9210,	output: -76.5431,	loss:
0.0497			
i: 517,	target: -24.7750,	output: 12.6034,	loss:
1.5087			
i: 518,	target: -68.0430,	output: -51.6295,	loss:
0.2412			
i: 519,	target: 206.3210,	output: 188.2335,	loss:
0.0877			
i: 520,	target: -89.1490,	output: -73.7816,	loss:
0.1724			
i: 521,	target: 178.0520,	output: 212.1819,	loss:
0.1917			
i: 522,	target: 11.8100,	output: 160.9239,	loss:
12.6261			
i: 523,	target: -47.3020,	output: -30.7400,	loss:
0.3501			
i: 524,	target: -97.6290,	output: -26.1084,	loss:
0.7326			
i: 525,	target: -45.9520,	output: -41.8323,	loss:
0.0897			
i: 526,	target: -47.9080,	output: -85.3378,	loss:
0.7813			
i: 527,	target: 203.9810,	output: 163.9872,	loss:
0.1961			
i: 528,	target: 320.4970,	output: 19.1052,	loss:
0.9404			
i: 529,	target: -80.5170,	output: -67.9702,	loss:
0.1558			
i: 530,	target: -68.6850,	output: 0.3074,	loss:
1.0045			
i: 531,	target: 134.1550,	output: 129.2292,	loss:
0.0367			
i: 532,	target: 207.3990,	output: 124.0097,	loss:
0.4021			
i: 533,	target: -40.7610,	output: 14.4458,	loss:
1.3544			
i: 534,	target: -47.6250,	output: 48.1261,	loss:
2.0105			
i: 535,	target: -54.3520,	output: -38.5230,	loss:
0.2912			
i: 536,	target: -95.0830,	output: -68.4380,	loss:

0.2802			
i: 537,	target: 126.6880,	output: 178.1577,	loss:
0.4063			
i: 538,	target: -40.6320,	output: -64.2587,	loss:
0.5815			
i: 539,	target: -83.7080,	output: -60.9775,	loss:
0.2715			
i: 540,	target: 408.2380,	output: 181.0082,	loss:
0.5566			
i: 541,	target: 49.3610,	output: 11.8784,	loss:
0.7594			
i: 542,	target: 79.3180,	output: 195.8933,	loss:
1.4697			
i: 543,	target: -46.2880,	output: -52.6940,	loss:
0.1384			
i: 544,	target: -22.6330,	output: -57.3287,	loss:
1.5330			
i: 545,	target: -85.1180,	output: -29.2555,	loss:
0.6563			
i: 546,	target: -36.2070,	output: -47.7109,	loss:
0.3177			
i: 547,	target: -67.2370,	output: -94.4058,	loss:
0.4041			
i: 548,	target: -81.0470,	output: -44.4049,	loss:
0.4521			
i: 549,	target: -104.2530,	output: -58.6000,	loss:
0.4379			
i: 550,	target: -51.7560,	output: 7.4081,	loss:
1.1431			
i: 551,	target: 186.3230,	output: 113.4839,	loss:
0.3909			
i: 552,	target: -66.5640,	output: 5.4033,	loss:
1.0812			
i: 553,	target: -79.1570,	output: -40.2950,	loss:
0.4909			
i: 554,	target: 152.5540,	output: 206.9222,	loss:
0.3564			
i: 555,	target: 171.3540,	output: 134.8996,	loss:
0.2127			
i: 556,	target: -50.2740,	output: -43.7572,	loss:
0.1296			
i: 557,	target: -65.3650,	output: -62.1842,	loss:
0.0487			
i: 558,	target: 87.4860,	output: 70.5401,	loss:
0.1937			
i: 559,	target: -84.7220,	output: -62.8277,	loss:
0.2584			
i: 560,	target: 94.4410,	output: 162.5489,	loss:

0.7212			
i: 561,	target: 224.8350,	output: -14.8818,	loss:
1.0662			
i: 562,	target: 201.8810,	output: 163.8350,	loss:
0.1885			
i: 563,	target: 127.9870,	output: 176.3580,	loss:
0.3779			
i: 564,	target: -70.9570,	output: -36.8401,	loss:
0.4808			
i: 565,	target: -72.9650,	output: -19.8266,	loss:
0.7283			
i: 566,	target: -47.7780,	output: -58.4792,	loss:
0.2240			
i: 567,	target: 306.9250,	output: -6.5402,	loss:
1.0213			
i: 568,	target: 50.3710,	output: -46.6124,	loss:
1.9254			
i: 569,	target: -27.8310,	output: 8.2552,	loss:
1.2966			
i: 570,	target: -51.1820,	output: -53.3335,	loss:
0.0420			
i: 571,	target: -62.7040,	output: -47.0204,	loss:
0.2501			
i: 572,	target: -88.0690,	output: 7.3219,	loss:
1.0831			
i: 573,	target: -48.1820,	output: 57.1401,	loss:
2.1859			
i: 574,	target: 191.4000,	output: 49.9306,	loss:
0.7391			
i: 575,	target: -76.1530,	output: -69.7126,	loss:
0.0846			
i: 576,	target: 180.6000,	output: 143.2859,	loss:
0.2066			
i: 577,	target: 131.4980,	output: 206.6921,	loss:
0.5718			
i: 578,	target: -82.0020,	output: -10.0596,	loss:
0.8773			
i: 579,	target: -71.6330,	output: -27.2140,	loss:
0.6201			
i: 580,	target: -82.6380,	output: -51.3450,	loss:
0.3787			
i: 581,	target: -70.2380,	output: -61.2021,	loss:
0.1286			
i: 582,	target: 158.0430,	output: 183.3735,	loss:
0.1603			
i: 583,	target: -4.0500,	output: 19.1774,	loss:
5.7352			
i: 584,	target: 14.6260,	output: 37.2341,	loss:

1.5457			
i: 585,	target: 195.7590,	output: 208.6091,	loss:
0.0656			
i: 586,	target: -56.0040,	output: -39.5225,	loss:
0.2943			
i: 587,	target: 198.2490,	output: 176.8074,	loss:
0.1082			
i: 588,	target: -53.6570,	output: -12.5465,	loss:
0.7662			
i: 589,	target: 164.9770,	output: 202.4496,	loss:
0.2271			
i: 590,	target: -77.8840,	output: -50.2508,	loss:
0.3548			
i: 591,	target: 21.6940,	output: 29.4407,	loss:
0.3571			
i: 592,	target: -96.2800,	output: 44.9833,	loss:
1.4672			
i: 593,	target: -42.4260,	output: -26.2612,	loss:
0.3810			
i: 594,	target: 136.5470,	output: 171.3750,	loss:
0.2551			
i: 595,	target: 175.3350,	output: 203.3067,	loss:
0.1595			
i: 596,	target: 5.5500,	output: 23.9750,	loss:
3.3198			
i: 597,	target: 228.0060,	output: 78.6423,	loss:
0.6551			
i: 598,	target: 153.1020,	output: 136.6557,	loss:
0.1074			
i: 599,	target: 54.6660,	output: 64.4266,	loss:
0.1785			
i: 600,	target: 303.6820,	output: -7.9193,	loss:
1.0261			
i: 601,	target: 192.4440,	output: 91.3556,	loss:
0.5253			
i: 602,	target: -30.5150,	output: -33.0074,	loss:
0.0817			
i: 603,	target: 234.1110,	output: 96.8148,	loss:
0.5865			
i: 604,	target: 194.9440,	output: 194.7061,	loss:
0.0012			
i: 605,	target: -17.1860,	output: -7.3536,	loss:
0.5721			
i: 606,	target: -20.4580,	output: -32.9982,	loss:
0.6130			
i: 607,	target: 307.5690,	output: 212.2435,	loss:
0.3099			
i: 608,	target: 208.1290,	output: 153.0819,	loss:

0.2645			
i: 609,	target: -91.0430,	output: -62.8022,	loss:
0.3102			
i: 610,	target: -63.5960,	output: -27.1975,	loss:
0.5723			
i: 611,	target: 63.0970,	output: 46.1776,	loss:
0.2681			
i: 612,	target: -59.5340,	output: -57.9683,	loss:
0.0263			
i: 613,	target: -83.3220,	output: -89.8486,	loss:
0.0783			
i: 614,	target: -39.2750,	output: -88.2998,	loss:
1.2482			
i: 615,	target: -40.5240,	output: -56.5981,	loss:
0.3967			
i: 616,	target: 323.7580,	output: -7.8839,	loss:
1.0244			
i: 617,	target: -66.3120,	output: -78.8836,	loss:
0.1896			
i: 618,	target: 158.8160,	output: 159.6388,	loss:
0.0052			
i: 619,	target: 163.0240,	output: 210.2340,	loss:
0.2896			
i: 620,	target: 73.9960,	output: 53.4685,	loss:
0.2774			
i: 621,	target: -74.1670,	output: -53.8170,	loss:
0.2744			
i: 622,	target: -56.2460,	output: -65.9722,	loss:
0.1729			
i: 623,	target: -60.2920,	output: -51.7481,	loss:
0.1417			
i: 624,	target: 152.6970,	output: 110.8073,	loss:
0.2743			
i: 625,	target: -54.1410,	output: -61.8897,	loss:
0.1431			
i: 626,	target: -73.5950,	output: -58.7437,	loss:
0.2018			
i: 627,	target: 207.1690,	output: 217.7682,	loss:
0.0512			
i: 628,	target: -77.6230,	output: -65.2083,	loss:
0.1599			
i: 629,	target: 126.0450,	output: 219.1884,	loss:
0.7390			
i: 630,	target: 25.2550,	output: 57.5017,	loss:
1.2768			
i: 631,	target: 144.9670,	output: 181.5725,	loss:
0.2525			
i: 632,	target: -69.5770,	output: -64.4438,	loss:

0.0738			
i: 633,	target: 20.4960,	output: 52.1397,	loss:
1.5439			
i: 634,	target: -59.3390,	output: -69.6230,	loss:
0.1733			
i: 635,	target: -65.9960,	output: -54.8101,	loss:
0.1695			
i: 636,	target: 43.6540,	output: -60.4141,	loss:
2.3839			
i: 637,	target: 209.4640,	output: 203.1061,	loss:
0.0304			
i: 638,	target: 171.5670,	output: 56.6952,	loss:
0.6695			
i: 639,	target: -50.8710,	output: -77.2480,	loss:
0.5185			
i: 640,	target: -21.2290,	output: 61.7346,	loss:
3.9080			
i: 641,	target: -55.6640,	output: -17.6205,	loss:
0.6834			
i: 642,	target: -75.8150,	output: -83.8942,	loss:
0.1066			
i: 643,	target: -56.4230,	output: -86.5545,	loss:
0.5340			
i: 644,	target: 208.3310,	output: 123.9822,	loss:
0.4049			
i: 645,	target: 495.9590,	output: 212.4806,	loss:
0.5716			
i: 646,	target: -77.8690,	output: -60.5260,	loss:
0.2227			
i: 647,	target: -39.6280,	output: -83.3501,	loss:
1.1033			
i: 648,	target: -59.5170,	output: -88.9225,	loss:
0.4941			
i: 649,	target: 3.1040,	output: 46.4579,	loss:
13.9671			
i: 650,	target: 198.2380,	output: 211.4035,	loss:
0.0664			
i: 651,	target: -79.4910,	output: -79.6534,	loss:
0.0020			
i: 652,	target: -18.9060,	output: 52.8207,	loss:
3.7939			
i: 653,	target: -26.1920,	output: 10.9817,	loss:
1.4193			
i: 654,	target: 38.8520,	output: 22.7649,	loss:
0.4141			
i: 655,	target: -31.0120,	output: 8.3453,	loss:
1.2691			
i: 656,	target: -78.6060,	output: -66.4146,	loss:

0.1551			
i: 657,	target: 245.5800,	output: 14.8328,	loss:
0.9396			
i: 658,	target: -28.6800,	output: 33.4310,	loss:
2.1657			
i: 659,	target: 141.2640,	output: 164.5686,	loss:
0.1650			
i: 660,	target: -36.7870,	output: -47.2136,	loss:
0.2834			
i: 661,	target: 291.1650,	output: 235.8748,	loss:
0.1899			
i: 662,	target: 91.4960,	output: 189.2330,	loss:
1.0682			
i: 663,	target: 177.3140,	output: 161.1689,	loss:
0.0911			
i: 664,	target: 140.3390,	output: 131.1524,	loss:
0.0655			
i: 665,	target: 193.1860,	output: 207.5469,	loss:
0.0743			
i: 666,	target: -54.1740,	output: -63.1606,	loss:
0.1659			
i: 667,	target: 224.3060,	output: -30.7207,	loss:
1.1370			
i: 668,	target: -60.2940,	output: -34.7404,	loss:
0.4238			
i: 669,	target: 163.4350,	output: 59.7290,	loss:
0.6345			
i: 670,	target: 163.1140,	output: 154.1359,	loss:
0.0550			
i: 671,	target: 9.2230,	output: 18.2998,	loss:
0.9841			
i: 672,	target: 158.2140,	output: 168.9879,	loss:
0.0681			
i: 673,	target: 37.4580,	output: -46.9812,	loss:
2.2542			
i: 674,	target: -41.5060,	output: -50.8271,	loss:
0.2246			
i: 675,	target: 194.6200,	output: 170.5996,	loss:
0.1234			
i: 676,	target: -62.4590,	output: -58.1659,	loss:
0.0687			
i: 677,	target: -54.6830,	output: -32.2996,	loss:
0.4093			
i: 678,	target: 145.0360,	output: 203.0740,	loss:
0.4002			
i: 679,	target: -32.2470,	output: -33.7758,	loss:
0.0474			
i: 680,	target: 28.1000,	output: 83.4627,	loss:

1.9702			
i: 681,	target: 237.1440,	output: 52.8322,	loss:
0.7772			
i: 682,	target: -80.2490,	output: -56.8030,	loss:
0.2922			
i: 683,	target: -71.8460,	output: -63.6695,	loss:
0.1138			
i: 684,	target: 6.9200,	output: 34.0319,	loss:
3.9179			
i: 685,	target: -74.7800,	output: -85.5522,	loss:
0.1441			
i: 686,	target: -78.3580,	output: -38.3449,	loss:
0.5106			
i: 687,	target: 216.6130,	output: 217.7505,	loss:
0.0053			
i: 688,	target: -102.5370,	output: -66.4485,	loss:
0.3520			
i: 689,	target: -44.4370,	output: -3.8730,	loss:
0.9128			
i: 690,	target: -76.5800,	output: -63.1423,	loss:
0.1755			
i: 691,	target: 46.7510,	output: 181.5888,	loss:
2.8842			
i: 692,	target: -71.5930,	output: -90.7108,	loss:
0.2670			
i: 693,	target: 78.4910,	output: -17.3735,	loss:
1.2213			
i: 694,	target: -100.6580,	output: -51.3165,	loss:
0.4902			
i: 695,	target: -81.8690,	output: -45.7055,	loss:
0.4417			
i: 696,	target: -66.5210,	output: -64.4194,	loss:
0.0316			
i: 697,	target: -61.8470,	output: -57.6835,	loss:
0.0673			
i: 698,	target: -83.1650,	output: -60.6945,	loss:
0.2702			
i: 699,	target: 28.2480,	output: -39.1255,	loss:
2.3851			
i: 700,	target: 199.0050,	output: 147.3967,	loss:
0.2593			
i: 701,	target: 183.9860,	output: 199.9572,	loss:
0.0868			
i: 702,	target: 34.7150,	output: -41.5034,	loss:
2.1955			
i: 703,	target: -61.7320,	output: 4.5143,	loss:
1.0731			
i: 704,	target: -80.3800,	output: -46.3513,	loss:

0.4233			
i: 705,	target: -73.7670,	output: -48.7811,	loss:
0.3387			
i: 706,	target: -95.9290,	output: -54.6206,	loss:
0.4306			
i: 707,	target: 248.3460,	output: 3.0051,	loss:
0.9879			
i: 708,	target: -77.8950,	output: -61.2417,	loss:
0.2138			
i: 709,	target: -85.0090,	output: -87.5665,	loss:
0.0301			
i: 710,	target: 36.4450,	output: -55.2674,	loss:
2.5165			
i: 711,	target: 492.7070,	output: 232.8832,	loss:
0.5273			
i: 712,	target: 111.9290,	output: 141.4700,	loss:
0.2639			
i: 713,	target: 267.0160,	output: 77.7264,	loss:
0.7089			
i: 714,	target: 32.7170,	output: 149.5900,	loss:
3.5722			
i: 715,	target: -70.1940,	output: -59.4451,	loss:
0.1531			
i: 716,	target: -93.8320,	output: -49.6455,	loss:
0.4709			
i: 717,	target: -37.9900,	output: -24.4417,	loss:
0.3566			
i: 718,	target: -72.4380,	output: 10.3436,	loss:
1.1428			
i: 719,	target: 190.4070,	output: 77.1905,	loss:
0.5946			
i: 720,	target: 3.9300,	output: 34.8162,	loss:
7.8591			
i: 721,	target: -42.4740,	output: 18.7388,	loss:
1.4412			
i: 722,	target: -44.4290,	output: 14.4247,	loss:
1.3247			
i: 723,	target: 214.3530,	output: 105.2895,	loss:
0.5088			
i: 724,	target: -13.0870,	output: 69.5645,	loss:
6.3155			
i: 725,	target: -64.2260,	output: -55.6220,	loss:
0.1340			
i: 726,	target: 7.7930,	output: 44.9524,	loss:
4.7683			
i: 727,	target: 91.7810,	output: 119.4399,	loss:
0.3014			
i: 728,	target: 248.0150,	output: 60.1477,	loss:

0.7575			
i: 729,	target: -37.1100,	output: -33.8170,	loss:
0.0887			
i: 730,	target: 121.5910,	output: 121.9417,	loss:
0.0029			
i: 731,	target: 222.8480,	output: 75.6923,	loss:
0.6603			
i: 732,	target: -80.4390,	output: -59.3083,	loss:
0.2627			
i: 733,	target: 203.2990,	output: 125.9243,	loss:
0.3806			
i: 734,	target: -58.9450,	output: -49.9106,	loss:
0.1533			
i: 735,	target: 202.0950,	output: 184.8825,	loss:
0.0852			
i: 736,	target: -50.0090,	output: -39.1090,	loss:
0.2180			
i: 737,	target: 65.8960,	output: 47.4719,	loss:
0.2796			
i: 738,	target: 307.2040,	output: 1.9680,	loss:
0.9936			
i: 739,	target: -82.6700,	output: -68.4066,	loss:
0.1725			
i: 740,	target: -61.4920,	output: -38.7709,	loss:
0.3695			
i: 741,	target: -59.7410,	output: -100.8424,	loss:
0.6880			
i: 742,	target: -72.4250,	output: -41.8069,	loss:
0.4228			
i: 743,	target: -41.0590,	output: -30.6545,	loss:
0.2534			
i: 744,	target: 110.9790,	output: 168.4019,	loss:
0.5174			
i: 745,	target: -36.2620,	output: -59.9534,	loss:
0.6533			
i: 746,	target: -51.2670,	output: -83.1514,	loss:
0.6219			
i: 747,	target: -80.7320,	output: -73.4548,	loss:
0.0901			
i: 748,	target: 23.5590,	output: 149.4560,	loss:
5.3439			
i: 749,	target: -73.2990,	output: -45.1728,	loss:
0.3837			
i: 750,	target: -98.8630,	output: -48.2488,	loss:
0.5120			
i: 751,	target: -61.2160,	output: -62.2861,	loss:
0.0175			
i: 752,	target: -90.2410,	output: -67.6934,	loss:

0.2499			
i: 753,	target: 199.0000,	output: 131.2849,	loss:
0.3403			
i: 754,	target: -76.0990,	output: -48.0579,	loss:
0.3685			
i: 755,	target: -101.1460,	output: -61.4679,	loss:
0.3923			
i: 756,	target: -70.2120,	output: -32.5912,	loss:
0.5358			
i: 757,	target: 220.7980,	output: -23.2278,	loss:
1.1052			
i: 758,	target: 95.7530,	output: 125.3196,	loss:
0.3088			
i: 759,	target: -93.5400,	output: -57.4807,	loss:
0.3855			
i: 760,	target: -48.8840,	output: -41.3904,	loss:
0.1533			
i: 761,	target: -77.4740,	output: -57.4142,	loss:
0.2589			
i: 762,	target: 270.3550,	output: 156.1878,	loss:
0.4223			
i: 763,	target: 148.4820,	output: 183.7773,	loss:
0.2377			
i: 764,	target: -76.2150,	output: -77.1085,	loss:
0.0117			
i: 765,	target: 193.6570,	output: 173.4128,	loss:
0.1045			
i: 766,	target: -81.6860,	output: -54.9339,	loss:
0.3275			
i: 767,	target: -80.7850,	output: -51.5095,	loss:
0.3624			
i: 768,	target: -84.0860,	output: -60.2263,	loss:
0.2838			
i: 769,	target: 34.4450,	output: 9.5884,	loss:
0.7216			
i: 770,	target: 115.2740,	output: 152.6284,	loss:
0.3240			
i: 771,	target: -106.6850,	output: -86.4830,	loss:
0.1894			
i: 772,	target: 31.4560,	output: 76.1896,	loss:
1.4221			
i: 773,	target: -110.6630,	output: -61.1697,	loss:
0.4472			
i: 774,	target: 204.2170,	output: 160.1806,	loss:
0.2156			
i: 775,	target: 215.4180,	output: 153.9887,	loss:
0.2852			
i: 776,	target: -56.8200,	output: -4.4361,	loss:

0.9219			
i: 777,	target: -59.8260,	output: -56.9267,	loss:
0.0485			
i: 778,	target: 178.5230,	output: 190.5367,	loss:
0.0673			
i: 779,	target: -77.3060,	output: -58.2427,	loss:
0.2466			
i: 780,	target: 90.0280,	output: 159.0902,	loss:
0.7671			
i: 781,	target: -34.5420,	output: -69.9605,	loss:
1.0254			
i: 782,	target: 29.7620,	output: 26.0130,	loss:
0.1260			
i: 783,	target: 235.8850,	output: 222.8224,	loss:
0.0554			
i: 784,	target: -103.9500,	output: -47.2207,	loss:
0.5457			
i: 785,	target: 196.7240,	output: 214.6724,	loss:
0.0912			
i: 786,	target: -5.5610,	output: -12.7222,	loss:
1.2878			
i: 787,	target: -70.2410,	output: -55.5318,	loss:
0.2094			
i: 788,	target: 78.3600,	output: -73.6419,	loss:
1.9398			
i: 789,	target: -72.4020,	output: -36.0726,	loss:
0.5018			
i: 790,	target: 76.4960,	output: 42.9266,	loss:
0.4388			
i: 791,	target: -65.8040,	output: -5.3641,	loss:
0.9185			
i: 792,	target: 209.9330,	output: 191.7958,	loss:
0.0864			
i: 793,	target: -71.0680,	output: -62.7426,	loss:
0.1171			
i: 794,	target: 26.9090,	output: 84.5561,	loss:
2.1423			
i: 795,	target: -33.3220,	output: 109.9332,	loss:
4.2991			
i: 796,	target: 94.8230,	output: 131.3217,	loss:
0.3849			
i: 797,	target: -74.1320,	output: -69.4034,	loss:
0.0638			
i: 798,	target: 206.1240,	output: -3.3008,	loss:
1.0160			
i: 799,	target: -46.0240,	output: -57.2609,	loss:
0.2442			
i: 800,	target: 160.4950,	output: 184.0402,	loss:

0.1467			
i: 801,	target: -41.5090,	output: -24.9686,	loss:
0.3985			
i: 802,	target: 112.7450,	output: 190.1454,	loss:
0.6865			
i: 803,	target: 93.6410,	output: 196.0228,	loss:
1.0933			
i: 804,	target: 21.5690,	output: -41.1155,	loss:
2.9062			
i: 805,	target: -80.9780,	output: -60.1222,	loss:
0.2575			
i: 806,	target: 107.2720,	output: 186.5326,	loss:
0.7389			
i: 807,	target: -31.0690,	output: -21.7564,	loss:
0.2997			
i: 808,	target: 3.0890,	output: -39.4305,	loss:
13.7648			
i: 809,	target: -15.5800,	output: 6.6129,	loss:
1.4244			
i: 810,	target: -79.9440,	output: -58.9497,	loss:
0.2626			
i: 811,	target: -76.7270,	output: -32.6283,	loss:
0.5747			
i: 812,	target: -72.7320,	output: -64.2817,	loss:
0.1162			
i: 813,	target: 195.2030,	output: 40.4262,	loss:
0.7929			
i: 814,	target: 191.9220,	output: 208.3002,	loss:
0.0853			
i: 815,	target: 14.1460,	output: 31.0007,	loss:
1.1915			
i: 816,	target: 55.6160,	output: 156.2442,	loss:
1.8093			
i: 817,	target: -62.2290,	output: -83.0996,	loss:
0.3354			
i: 818,	target: 191.2670,	output: 46.8655,	loss:
0.7550			
i: 819,	target: 87.2380,	output: 159.5334,	loss:
0.8287			
i: 820,	target: 278.3860,	output: 216.4555,	loss:
0.2225			
i: 821,	target: -47.5080,	output: -45.5148,	loss:
0.0420			
i: 822,	target: -56.4090,	output: -51.4982,	loss:
0.0871			
i: 823,	target: 151.2150,	output: 153.5185,	loss:
0.0152			
i: 824,	target: 202.5830,	output: 187.4237,	loss:

0.0748			
i: 825,	target: -72.1080,	output: -71.0346,	loss:
0.0149			
i: 826,	target: 175.4270,	output: 152.7054,	loss:
0.1295			
i: 827,	target: -101.1830,	output: -38.3654,	loss:
0.6208			
i: 828,	target: -81.9900,	output: -67.0596,	loss:
0.1821			
i: 829,	target: 186.8650,	output: 12.6595,	loss:
0.9323			
i: 830,	target: 199.2800,	output: -13.2958,	loss:
1.0667			
i: 831,	target: -58.0540,	output: -47.4432,	loss:
0.1828			
i: 832,	target: -92.9380,	output: -61.5807,	loss:
0.3374			
i: 833,	target: -41.8880,	output: -35.5847,	loss:
0.1505			
i: 834,	target: -58.7490,	output: -67.6254,	loss:
0.1511			
i: 835,	target: -64.2190,	output: -79.2130,	loss:
0.2335			
i: 836,	target: 207.0650,	output: 198.3397,	loss:
0.0421			
i: 837,	target: -78.7840,	output: -61.7634,	loss:
0.2160			
i: 838,	target: 195.1230,	output: 177.2541,	loss:
0.0916			
i: 839,	target: 152.4760,	output: 142.6330,	loss:
0.0646			
i: 840,	target: -101.8700,	output: -16.6745,	loss:
0.8363			
i: 841,	target: -92.6970,	output: -68.9455,	loss:
0.2562			
i: 842,	target: 310.6920,	output: 191.5537,	loss:
0.3835			
i: 843,	target: -73.2960,	output: -70.1354,	loss:
0.0431			
i: 844,	target: -80.2990,	output: -97.8918,	loss:
0.2191			
i: 845,	target: -74.1260,	output: -66.9827,	loss:
0.0964			
i: 846,	target: -27.6980,	output: -27.2546,	loss:
0.0160			
i: 847,	target: -90.7620,	output: -62.7327,	loss:
0.3088			
i: 848,	target: 113.6770,	output: 46.0979,	loss:

0.5945			
i: 849,	target: -102.6840,	output: -17.8226,	loss:
0.8264			
i: 850,	target: -25.4360,	output: -41.8401,	loss:
0.6449			
i: 851,	target: -69.4390,	output: -62.0641,	loss:
0.1062			
i: 852,	target: -75.1020,	output: -65.2800,	loss:
0.1308			
i: 853,	target: -72.2970,	output: -62.7794,	loss:
0.1316			
i: 854,	target: -74.7870,	output: -18.1607,	loss:
0.7572			
i: 855,	target: -49.5350,	output: -25.8468,	loss:
0.4782			
i: 856,	target: -38.2200,	output: 71.6346,	loss:
2.8743			
i: 857,	target: -58.3050,	output: -45.5212,	loss:
0.2193			
i: 858,	target: -78.7210,	output: -61.4318,	loss:
0.2196			
i: 859,	target: 12.3670,	output: -53.6848,	loss:
5.3410			
i: 860,	target: -50.9910,	output: -4.8096,	loss:
0.9057			
i: 861,	target: 243.9540,	output: -58.2828,	loss:
1.2389			
i: 862,	target: -82.1550,	output: -55.6437,	loss:
0.3227			
i: 863,	target: -59.3190,	output: -66.9741,	loss:
0.1290			
i: 864,	target: -82.1200,	output: -59.5696,	loss:
0.2746			
i: 865,	target: -87.0810,	output: -88.0056,	loss:
0.0106			
i: 866,	target: -97.7950,	output: -85.1586,	loss:
0.1292			
i: 867,	target: 33.9740,	output: 33.6409,	loss:
0.0098			
i: 868,	target: -53.7340,	output: -47.9554,	loss:
0.1075			
i: 869,	target: 123.0220,	output: 11.0939,	loss:
0.9098			
i: 870,	target: 166.9770,	output: 108.7928,	loss:
0.3485			
i: 871,	target: -69.2750,	output: -49.5892,	loss:
0.2842			
i: 872,	target: 152.0050,	output: 155.3345,	loss:

0.0219			
i: 873,	target: 478.5480,	output: 234.8613,	loss:
0.5092			
i: 874,	target: -54.5110,	output: -72.9981,	loss:
0.3391			
i: 875,	target: 242.5820,	output: 190.1522,	loss:
0.2161			
i: 876,	target: -79.7920,	output: -52.4536,	loss:
0.3426			
i: 877,	target: -82.6100,	output: -78.6465,	loss:
0.0480			
i: 878,	target: 314.9420,	output: 48.2192,	loss:
0.8469			
i: 879,	target: 186.7170,	output: 189.7680,	loss:
0.0163			
i: 880,	target: -95.3540,	output: -63.2970,	loss:
0.3362			
i: 881,	target: -77.8010,	output: -43.3785,	loss:
0.4424			
i: 882,	target: -46.8220,	output: -96.2836,	loss:
1.0564			
i: 883,	target: -94.0320,	output: -63.4313,	loss:
0.3254			
i: 884,	target: 164.2750,	output: 153.9319,	loss:
0.0630			
i: 885,	target: 40.8730,	output: -31.0617,	loss:
1.7600			
i: 886,	target: -63.5220,	output: -52.2804,	loss:
0.1770			
i: 887,	target: 143.3290,	output: 121.1713,	loss:
0.1546			
i: 888,	target: 142.4130,	output: 134.0755,	loss:
0.0585			
i: 889,	target: 6.1520,	output: -8.7499,	loss:
2.4223			
i: 890,	target: -48.6370,	output: 7.5738,	loss:
1.1557			
i: 891,	target: -60.5610,	output: -12.2263,	loss:
0.7981			
i: 892,	target: 143.5880,	output: 56.2067,	loss:
0.6086			
i: 893,	target: 8.2650,	output: 32.7975,	loss:
2.9682			
i: 894,	target: -60.9810,	output: -26.0512,	loss:
0.5728			
i: 895,	target: 275.2880,	output: 203.1026,	loss:
0.2622			
i: 896,	target: -52.3030,	output: -31.3953,	loss:

0.3997			
i: 897,	target: 47.7200,	output: -60.6381,	loss:
2.2707			
i: 898,	target: 6.6710,	output: 62.3129,	loss:
8.3409			
i: 899,	target: 81.2870,	output: 5.0435,	loss:
0.9380			
i: 900,	target: -52.8420,	output: -58.1910,	loss:
0.1012			
i: 901,	target: 119.8140,	output: 154.5685,	loss:
0.2901			
i: 902,	target: -55.4090,	output: -64.5691,	loss:
0.1653			
i: 903,	target: -50.7820,	output: -41.4120,	loss:
0.1845			
i: 904,	target: 201.3840,	output: 202.1865,	loss:
0.0040			
i: 905,	target: -68.7890,	output: -55.6379,	loss:
0.1912			
i: 906,	target: 21.9100,	output: 106.0209,	loss:
3.8389			
i: 907,	target: 121.8370,	output: 182.1861,	loss:
0.4953			
i: 908,	target: -62.0390,	output: -29.3829,	loss:
0.5264			
i: 909,	target: 247.3570,	output: 51.9928,	loss:
0.7898			
i: 910,	target: 199.5590,	output: 88.7158,	loss:
0.5554			
i: 911,	target: -40.4660,	output: -52.8185,	loss:
0.3053			
i: 912,	target: -77.1860,	output: -74.2447,	loss:
0.0381			
i: 913,	target: -56.0280,	output: -47.7279,	loss:
0.1481			
i: 914,	target: 110.8250,	output: 37.4128,	loss:
0.6624			
i: 915,	target: -64.1160,	output: -61.9791,	loss:
0.0333			
i: 916,	target: -48.5070,	output: -40.1069,	loss:
0.1732			
i: 917,	target: -15.8370,	output: -45.9744,	loss:
1.9030			
i: 918,	target: -65.8490,	output: -51.8627,	loss:
0.2124			
i: 919,	target: 218.2460,	output: 183.7472,	loss:
0.1581			
i: 920,	target: -67.7070,	output: 47.5376,	loss:

1.7021			
i: 921,	target: -72.9590,	output: -19.3923,	loss:
0.7342			
i: 922,	target: -84.7130,	output: -56.8967,	loss:
0.3284			
i: 923,	target: 242.3930,	output: 160.8470,	loss:
0.3364			
i: 924,	target: 90.0480,	output: 144.8703,	loss:
0.6088			
i: 925,	target: -57.5680,	output: 13.0699,	loss:
1.2270			
i: 926,	target: -71.6590,	output: -48.5700,	loss:
0.3222			
i: 927,	target: -64.5990,	output: -61.1347,	loss:
0.0536			
i: 928,	target: -26.4280,	output: -61.2386,	loss:
1.3172			
i: 929,	target: 346.2550,	output: -27.0053,	loss:
1.0780			
i: 930,	target: -67.7020,	output: -5.8418,	loss:
0.9137			
i: 931,	target: 199.0140,	output: 29.1362,	loss:
0.8536			
i: 932,	target: -70.0720,	output: -68.8592,	loss:
0.0173			
i: 933,	target: 132.5940,	output: 60.1300,	loss:
0.5465			
i: 934,	target: -41.5930,	output: -53.4809,	loss:
0.2858			
i: 935,	target: 43.7730,	output: -50.2330,	loss:
2.1476			
i: 936,	target: -72.9550,	output: -69.1883,	loss:
0.0516			
i: 937,	target: 29.6670,	output: 133.8682,	loss:
3.5124			
i: 938,	target: 189.6530,	output: 206.6994,	loss:
0.0899			
i: 939,	target: 322.5680,	output: 21.2554,	loss:
0.9341			
i: 940,	target: 41.7360,	output: -72.5290,	loss:
2.7378			
i: 941,	target: -50.9050,	output: -30.2469,	loss:
0.4058			
i: 942,	target: -37.4900,	output: -58.2297,	loss:
0.5532			
i: 943,	target: 198.4550,	output: 132.9264,	loss:
0.3302			
i: 944,	target: -38.3210,	output: -65.6907,	loss:

0.7142			
i: 945,	target: -72.5260,	output: -54.1720,	loss:
0.2531			
i: 946,	target: 74.0080,	output: -1.7256,	loss:
1.0233			
i: 947,	target: 137.7260,	output: 177.4864,	loss:
0.2887			
i: 948,	target: -75.5320,	output: -63.6536,	loss:
0.1573			
i: 949,	target: 484.7230,	output: 170.0333,	loss:
0.6492			
i: 950,	target: 147.1480,	output: 197.2247,	loss:
0.3403			
i: 951,	target: 236.5820,	output: 19.3930,	loss:
0.9180			
i: 952,	target: 50.6370,	output: -58.4395,	loss:
2.1541			
i: 953,	target: -62.1870,	output: -29.4676,	loss:
0.5261			
i: 954,	target: -46.3160,	output: -52.8697,	loss:
0.1415			
i: 955,	target: 212.6600,	output: 51.5899,	loss:
0.7574			
i: 956,	target: -60.1740,	output: -62.4273,	loss:
0.0374			
i: 957,	target: -61.0050,	output: -61.6728,	loss:
0.0109			
i: 958,	target: -80.8870,	output: -68.9569,	loss:
0.1475			
i: 959,	target: 12.4010,	output: -4.6327,	loss:
1.3736			
i: 960,	target: 199.8870,	output: 205.9653,	loss:
0.0304			
i: 961,	target: -85.2020,	output: -86.6472,	loss:
0.0170			
i: 962,	target: 201.5600,	output: 182.2443,	loss:
0.0958			
i: 963,	target: 12.8640,	output: 40.0358,	loss:
2.1122			
i: 964,	target: 119.2510,	output: 180.6915,	loss:
0.5152			
i: 965,	target: 87.7480,	output: 178.5025,	loss:
1.0343			
i: 966,	target: -85.9460,	output: -58.3524,	loss:
0.3211			
i: 967,	target: -65.1280,	output: -89.3839,	loss:
0.3724			
i: 968,	target: -42.5210,	output: -55.7373,	loss:

0.3108			
i: 969,	target: 9.1500,	output: 50.7734,	loss:
4.5490			
i: 970,	target: 190.8470,	output: 191.4020,	loss:
0.0029			
i: 971,	target: 38.7200,	output: 36.7002,	loss:
0.0522			
i: 972,	target: -30.3580,	output: -25.1562,	loss:
0.1713			
i: 973,	target: -65.8400,	output: -69.5265,	loss:
0.0560			
i: 974,	target: 400.8750,	output: 111.3570,	loss:
0.7222			
i: 975,	target: -78.0550,	output: -59.5262,	loss:
0.2374			
i: 976,	target: -64.2010,	output: -86.0956,	loss:
0.3410			
i: 977,	target: -13.6510,	output: -18.9023,	loss:
0.3847			
i: 978,	target: 215.3510,	output: 166.4240,	loss:
0.2272			
i: 979,	target: -74.4520,	output: -47.3941,	loss:
0.3634			
i: 980,	target: -87.9590,	output: -69.3308,	loss:
0.2118			
i: 981,	target: 187.0820,	output: 217.0305,	loss:
0.1601			
i: 982,	target: 136.8140,	output: 161.8881,	loss:
0.1833			
i: 983,	target: 29.9350,	output: 58.7031,	loss:
0.9610			
i: 984,	target: 11.9800,	output: 45.7357,	loss:
2.8177			
i: 985,	target: -45.9710,	output: -39.3315,	loss:
0.1444			
i: 986,	target: -50.3260,	output: -34.3713,	loss:
0.3170			
i: 987,	target: -71.4490,	output: -52.9151,	loss:
0.2594			
i: 988,	target: 141.8580,	output: 187.4050,	loss:
0.3211			
i: 989,	target: -72.3670,	output: -74.4101,	loss:
0.0282			
i: 990,	target: -43.7990,	output: -52.7694,	loss:
0.2048			
i: 991,	target: 12.8770,	output: 64.1947,	loss:
3.9852			
i: 992,	target: -46.0840,	output: -34.7139,	loss:

```

0.2467
i: 993,          target: 241.5550,      output: -58.2447,      loss:
1.2411
i: 994,          target: -41.8080,      output: -45.2659,      loss:
0.0827
i: 995,          target: -13.0250,      output: 44.0900,      loss:
4.3850
i: 996,          target: -93.4570,      output: -58.9382,      loss:
0.3694
i: 997,          target: -49.5680,      output: 49.1742,      loss:
1.9921
i: 998,          target: -64.8750,      output: -30.2685,      loss:
0.5334
i: 999,          target: 191.8250,      output: 218.5739,      loss:
0.1394
Average loss: 0.7704
Saved in: peptide-QML/checkpoints/0809/txts/0809-sh_e_1qm_v2_validation_1.txt

```

```

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

```

```

[main 3c8beae1] data trained model
1 file changed, 1002 insertions(+)
create mode 100644 checkpoints/0809/txts/0809-sh_e_1qm_v2_validation_1.txt
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 24 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 15.90 KiB | 2.27 MiB/s, done.
Total 6 (delta 4), reused 0 (delta 0)
remote: Resolving deltas: 100% (4/4), completed with 4 local objects.
To github.com:raulconchello/peptide-QML.git
ce936269..3c8beae1 main -> main

```