

0725-small_hybrid_model_1q_measurement

July 25, 2023

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

```
[2]: import numpy as np
```

```
[3]: import sys
sys.path.append('.')

from my_code import functions as f
```

1 Data

```
[4]: file_path = '../data/energies/Trial/Strings_Energies_4_aa.txt' # Replace with
    ↳ the actual path to your 'data.txt' file
string_list, number_list = f.read_data_file(file_path)
score_list = np.array(number_list)/100
angles_list = np.array([f.string_to_numbers(string) for string in string_list])
```

```
[5]: X, Y, X_validation, Y_validation = f.create_validating_set(angles_list,
    ↳ score_list, percentage=0.1)
```

```
[6]: # Define the dataset
input_data = torch.tensor(X, dtype=torch.float32)
target_data = torch.tensor(Y, dtype=torch.float32).view(-1, 1)

# Define the validation set
input_validation = torch.tensor(X_validation, dtype=torch.float32)
target_validation = torch.tensor(Y_validation, dtype=torch.float32).view(-1, 1)
```

2 Quantum node

```
[7]: import pennylane as qml
```

```
[8]: def qml_RZZ(params, wires):
    """
```

RZZ gate.

"""

```
qml.CNOT(wires=wires)
qml.RZ(params, wires=wires[1])
qml.CNOT(wires=wires)
```

```
[9]: n_qubits = 4
n_layers_block = 25
n_layers_embedding = 3
n_layers = n_layers_block + n_layers_embedding
n_params = 5
dev = qml.device("default.qubit", wires=n_qubits)

@qml.qnode(dev)
def qnode(inputs, weights):

    # state preparation (we create an embedding with 3 layers, paper: 2001.
    ↪03622)
    for i in range(n_layers_embedding):

        # angle embedding for each qubit
        qml.AngleEmbedding(inputs, wires=range(n_qubits))

        # ZZ rotation for neighboring qubits
        for x in range(2):
            for j in range(x, n_qubits, 2):
                qml_RZZ(weights[i, j, 0], wires=[j, (j+1)%n_qubits])

        # rotations for each qubit
        for j in range(n_qubits):
            qml.RY(weights[i, j, 1], wires=j)

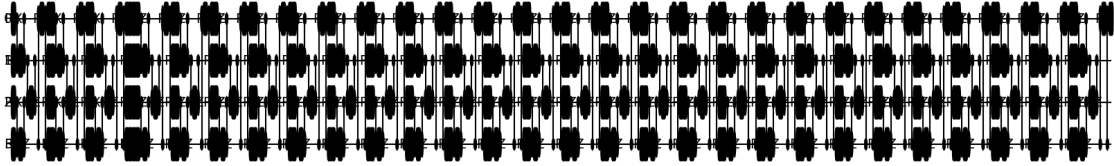
        # last angle embedding
        qml.AngleEmbedding(inputs, wires=range(n_qubits))

    #layers
    for i in range(n_layers_embedding, n_layers):
        # rotations for each qubit
        for j in range(n_qubits):
            qml.RX(weights[i, j, 2], wires=j)
            qml.RZ(weights[i, j, 3], wires=j)

        # ZZ rotation for neighboring qubits
        for x in range(2):
            for j in range(x, n_qubits, 2):
                qml_RZZ(weights[i, j, 4], wires=[j, (j+1)%n_qubits])
```

```
# measurement
return [qml.expval(qml.PauliZ(wires=0))]
```

```
[10]: qml.drawer.use_style("black_white")
fig, ax = qml.draw_mpl(qnode, expansion_strategy="device")([i for i in
    ↪range(n_qubits)], np.zeros((n_layers, n_qubits, n_params)))
fig.set_size_inches((16,3))
```



```
[11]: weight_shapes = {"weights": (n_layers, n_qubits, n_params)}
```

```
[12]: qlayer = qml.qnn.TorchLayer(qnode, weight_shapes)
```

3 Hybrid model

```
[13]: class MultiplyBy10Layer(nn.Module):
    def __init__(self):
        super(MultiplyBy10Layer, self).__init__()

    def forward(self, x):
        return x * 10
```

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

layers = [nn.Linear(input_dim*1, input_dim*2), nn.ReLU()]
layers += [nn.Linear(input_dim*2, input_dim*3), nn.ReLU()]
layers += [nn.Linear(input_dim*3, input_dim*3), nn.ReLU()]
layers += [nn.Linear(input_dim*3, input_dim*2), nn.ReLU()]
layers += [nn.Linear(input_dim*2, input_dim*1)]
layers += [qlayer, MultiplyBy10Layer()]
Net = nn.Sequential(*layers)
```

```
[15]: # Create an instance of the network
model = Net
```

```
[16]: import time
```

```

[17]: # time
start_time = time.time()

# Define the loss function and optimizer
criterion = nn.MSELoss() # Mean Squared Error loss
# optimizer = optim.Adam(model.parameters(), lr=0.001) # Adam optimizer with
↳ learning rate 0.001
optimizer = optim.SGD(model.parameters(), lr=0.01)

# Training loop
num_epochs = 10
batch_size = 32

losses = []
losses_epochs = []

for epoch in range(num_epochs):
    # Shuffle the dataset
    indices = torch.randperm(input_data.size(0))
    input_data = input_data[indices]
    target_data = target_data[indices]

    losses_epochs.append(0)

    # Mini-batch training
    for i in range(0, input_data.size(0), batch_size):
        inputs = input_data[i:i+batch_size]
        targets = target_data[i:i+batch_size]

        # Forward pass
        outputs = model(inputs)

        # Compute the loss
        loss = criterion(outputs, targets)

        # Backward pass and optimization
        optimizer.zero_grad()
        loss.backward()
        optimizer.step()

        # Store the loss
        losses.append(loss.item())

    print('- Epoch [{}/{}], i: [{}/{}], Loss: {:.4f}'.format(epoch+1,
↳ num_epochs, i, input_data.size(0), loss.item()), end='\r')

```

```

    # add to the epoch loss
    losses_epochs[-1] += loss.item()

    # divide the epoch loss by the number of batches, to get the average loss
    losses_epochs[-1] /= (input_data.size(0)/batch_size)

    # time
    # Compute elapsed time and remaining time
    elapsed_time = time.time() - start_time
    avg_time_per_epoch = elapsed_time / (epoch + 1)
    remaining_epochs = num_epochs - (epoch + 1)
    estimated_remaining_time = avg_time_per_epoch * remaining_epochs

    # Convert remaining time to hours, minutes, and seconds for better
    ↪readability
    hours, remainder = divmod(estimated_remaining_time, 3600)
    minutes, seconds = divmod(remainder, 60)

    # Print the loss and remaining time for this epoch
    print('Epoch [{}/{}], Loss: {:.4f}, Time remaining: ~{}h {}m {:.0f}s'.
    ↪format(
        epoch+1, num_epochs, losses_epochs[-1], hours, minutes, seconds))

```

```

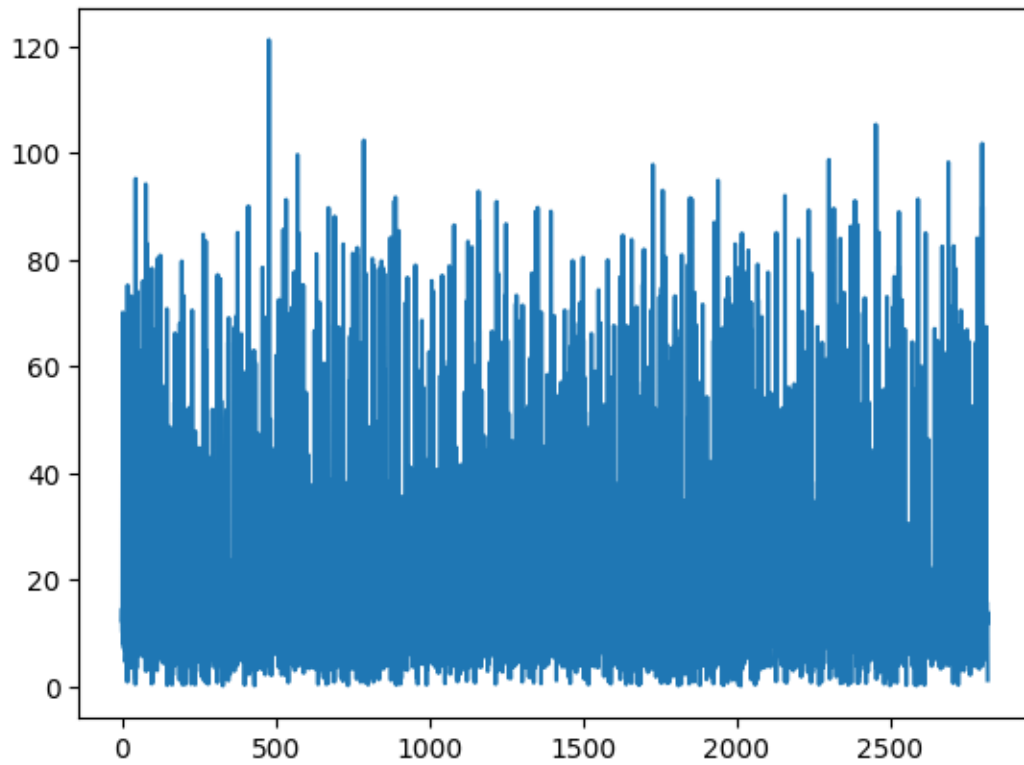
Epoch [1/10], Loss: 20.8253, Time remaining: ~0.0h 21.0m 57s
Epoch [2/10], Loss: 20.0819, Time remaining: ~0.0h 19.0m 14s
Epoch [3/10], Loss: 21.5421, Time remaining: ~0.0h 16.0m 45s
Epoch [4/10], Loss: 21.5007, Time remaining: ~0.0h 14.0m 19s
Epoch [5/10], Loss: 23.1200, Time remaining: ~0.0h 11.0m 48s
Epoch [6/10], Loss: 20.9038, Time remaining: ~0.0h 9.0m 19s
Epoch [7/10], Loss: 21.5262, Time remaining: ~0.0h 6.0m 54s
Epoch [8/10], Loss: 22.4668, Time remaining: ~0.0h 4.0m 36s
Epoch [9/10], Loss: 23.5024, Time remaining: ~0.0h 2.0m 17s
Epoch [10/10], Loss: 20.1112, Time remaining: ~0.0h 0.0m 0s

```

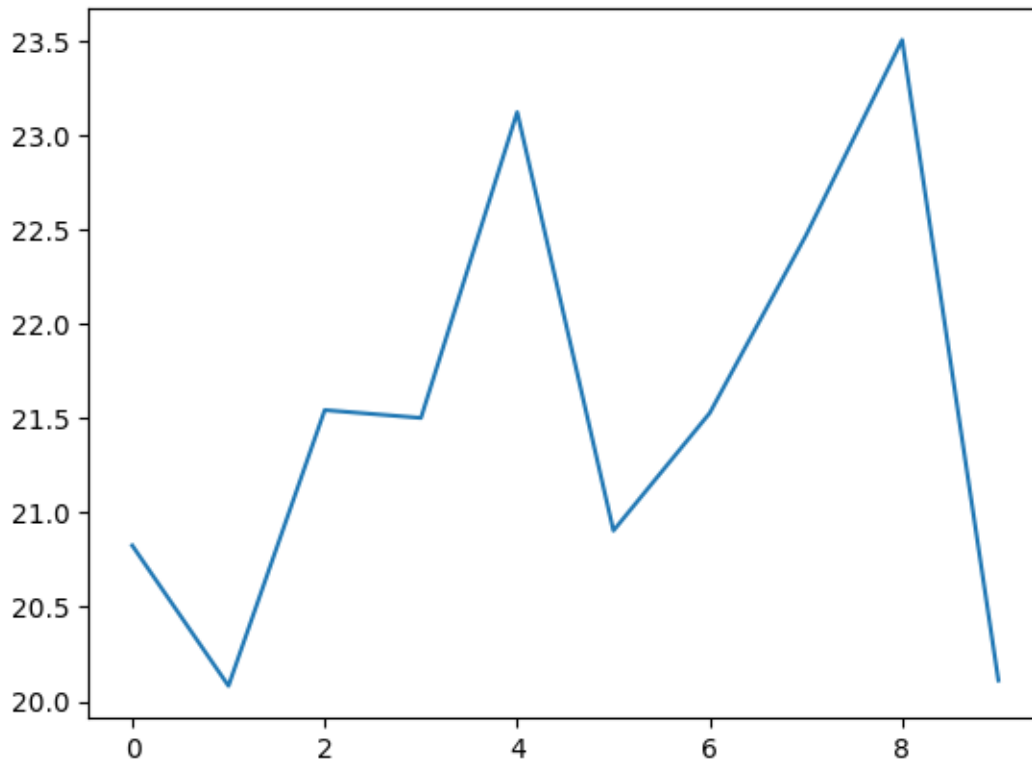
```

[18]: #plot the loss
import matplotlib.pyplot as plt
plt.plot(losses)
plt.show()

```



```
[19]: #plot the loss  
import matplotlib.pyplot as plt  
plt.plot(losses_epochs)  
plt.show()
```



```
[20]: avg_loss = 0
for x, (i, t) in enumerate(zip((input_validation), target_validation)):
    loss = criterion(model(i), t)
    avg_loss += loss/len(target_validation)
    print('i: {}, \t\t\t target: {:.3f}, \t\t output: {:.3f}, \t\t loss: {:.3f}'.
          format(x, t.item(), model(i).item(), loss))

print('Average loss: {:.3f}'.format(avg_loss))
```

i: 0,	target: -1.432,	output: -9.227,	loss: 60.761
i: 1,	target: -2.006,	output: -9.227,	loss: 52.143
i: 2,	target: -0.443,	output: -9.227,	loss: 77.159
i: 3,	target: -0.688,	output: -9.227,	loss: 72.923
i: 4,	target: -1.848,	output: -9.227,	loss: 54.449
i: 5,	target: -1.502,	output: -9.227,	loss: 59.684
i: 6,	target: -1.305,	output: -9.227,	loss: 62.753
i: 7,	target: -0.779,	output: -9.227,	loss: 71.366
i: 8,	target: -0.300,	output: -9.227,	loss: 79.695
i: 9,	target: -0.684,	output: -9.227,	loss: 72.980
i: 10,	target: -1.366,	output: -9.227,	loss: 61.791
i: 11,	target: -1.192,	output: -9.227,	loss: 64.569
i: 12,	target: -1.306,	output: -9.227,	loss: 62.745

i: 13,	target: -0.811,	output: -9.227,	loss: 70.825
i: 14,	target: -0.383,	output: -9.227,	loss: 78.220
i: 15,	target: 9.755,	output: -9.227,	loss: 360.328
i: 16,	target: -1.305,	output: -9.227,	loss: 62.762
i: 17,	target: -2.072,	output: -9.227,	loss: 51.192
i: 18,	target: -0.621,	output: -9.227,	loss: 74.064
i: 19,	target: -0.783,	output: -9.227,	loss: 71.304
i: 20,	target: -1.900,	output: -9.227,	loss: 53.682
i: 21,	target: -1.248,	output: -9.227,	loss: 63.670
i: 22,	target: -0.910,	output: -9.227,	loss: 69.174
i: 23,	target: -0.621,	output: -9.227,	loss: 74.059
i: 24,	target: -0.757,	output: -9.227,	loss: 71.743
i: 25,	target: -0.747,	output: -9.227,	loss: 71.910
i: 26,	target: -0.742,	output: -9.227,	loss: 72.000
i: 27,	target: -2.094,	output: -9.227,	loss: 50.888
i: 28,	target: -0.669,	output: -9.227,	loss: 73.246
i: 29,	target: -0.612,	output: -9.227,	loss: 74.218
i: 30,	target: -1.005,	output: -9.227,	loss: 67.603
i: 31,	target: -1.299,	output: -9.227,	loss: 62.861
i: 32,	target: -1.811,	output: -9.227,	loss: 54.992
i: 33,	target: 0.496,	output: -9.227,	loss: 94.544
i: 34,	target: -1.446,	output: -9.227,	loss: 60.548
i: 35,	target: -0.647,	output: -9.227,	loss: 73.614
i: 36,	target: -1.434,	output: -9.227,	loss: 60.728
i: 37,	target: 9.553,	output: -9.227,	loss: 352.698
i: 38,	target: -0.683,	output: -9.227,	loss: 73.003
i: 39,	target: -1.473,	output: -9.227,	loss: 60.130
i: 40,	target: -0.859,	output: -9.227,	loss: 70.022
i: 41,	target: -1.030,	output: -9.227,	loss: 67.195
i: 42,	target: -0.663,	output: -9.227,	loss: 73.337
i: 43,	target: -0.428,	output: -9.227,	loss: 77.421
i: 44,	target: -0.800,	output: -9.227,	loss: 71.014
i: 45,	target: -0.726,	output: -9.227,	loss: 72.268
i: 46,	target: -1.492,	output: -9.227,	loss: 59.839
i: 47,	target: -1.385,	output: -9.227,	loss: 61.496
i: 48,	target: -0.534,	output: -9.227,	loss: 75.568
i: 49,	target: -0.723,	output: -9.227,	loss: 72.328
i: 50,	target: -1.759,	output: -9.227,	loss: 55.769
i: 51,	target: -0.540,	output: -9.227,	loss: 75.458
i: 52,	target: -1.045,	output: -9.227,	loss: 66.939
i: 53,	target: -0.522,	output: -9.227,	loss: 75.776
i: 54,	target: -0.654,	output: -9.227,	loss: 73.495
i: 55,	target: -0.473,	output: -9.227,	loss: 76.632
i: 56,	target: 9.004,	output: -9.227,	loss: 332.365
i: 57,	target: -0.574,	output: -9.227,	loss: 74.884
i: 58,	target: -1.432,	output: -9.227,	loss: 60.761
i: 59,	target: -0.968,	output: -9.227,	loss: 68.214
i: 60,	target: -0.879,	output: -9.227,	loss: 69.684

i: 61,	target: -1.487,	output: -9.227,	loss: 59.905
i: 62,	target: -2.755,	output: -9.227,	loss: 41.893
i: 63,	target: -1.173,	output: -9.227,	loss: 64.866
i: 64,	target: -1.007,	output: -9.227,	loss: 67.572
i: 65,	target: -1.874,	output: -9.227,	loss: 54.075
i: 66,	target: -0.948,	output: -9.227,	loss: 68.544
i: 67,	target: -0.514,	output: -9.227,	loss: 75.916
i: 68,	target: -1.775,	output: -9.227,	loss: 55.539
i: 69,	target: -0.286,	output: -9.227,	loss: 79.952
i: 70,	target: 8.791,	output: -9.227,	loss: 324.647
i: 71,	target: -0.551,	output: -9.227,	loss: 75.277
i: 72,	target: -0.352,	output: -9.227,	loss: 78.764
i: 73,	target: -0.723,	output: -9.227,	loss: 72.326
i: 74,	target: -1.264,	output: -9.227,	loss: 63.418
i: 75,	target: -1.464,	output: -9.227,	loss: 60.262
i: 76,	target: -1.233,	output: -9.227,	loss: 63.900
i: 77,	target: -0.559,	output: -9.227,	loss: 75.140
i: 78,	target: -0.650,	output: -9.227,	loss: 73.566
i: 79,	target: -1.737,	output: -9.227,	loss: 56.108
i: 80,	target: -2.271,	output: -9.227,	loss: 48.384
i: 81,	target: 0.005,	output: -9.227,	loss: 85.236
i: 82,	target: -1.519,	output: -9.227,	loss: 59.408
i: 83,	target: -2.232,	output: -9.227,	loss: 48.937
i: 84,	target: -1.161,	output: -9.227,	loss: 65.061
i: 85,	target: -0.765,	output: -9.227,	loss: 71.611
i: 86,	target: -0.646,	output: -9.227,	loss: 73.629
i: 87,	target: -1.226,	output: -9.227,	loss: 64.022
i: 88,	target: -1.408,	output: -9.227,	loss: 61.146
i: 89,	target: -0.817,	output: -9.227,	loss: 70.728
i: 90,	target: -1.213,	output: -9.227,	loss: 64.231
i: 91,	target: -1.658,	output: -9.227,	loss: 57.285
i: 92,	target: -1.127,	output: -9.227,	loss: 65.617
i: 93,	target: -0.507,	output: -9.227,	loss: 76.039
i: 94,	target: -0.945,	output: -9.227,	loss: 68.587
i: 95,	target: -1.122,	output: -9.227,	loss: 65.700
i: 96,	target: -0.637,	output: -9.227,	loss: 73.793
i: 97,	target: -0.925,	output: -9.227,	loss: 68.917
i: 98,	target: -0.658,	output: -9.227,	loss: 73.422
i: 99,	target: -1.902,	output: -9.227,	loss: 53.663
i: 100,	target: -0.366,	output: -9.227,	loss: 78.512
i: 101,	target: -2.304,	output: -9.227,	loss: 47.930
i: 102,	target: -0.533,	output: -9.227,	loss: 75.593
i: 103,	target: -1.264,	output: -9.227,	loss: 63.412
i: 104,	target: -0.999,	output: -9.227,	loss: 67.706
i: 105,	target: 9.844,	output: -9.227,	loss: 363.707
i: 106,	target: -1.336,	output: -9.227,	loss: 62.269
i: 107,	target: -1.059,	output: -9.227,	loss: 66.717
i: 108,	target: -1.013,	output: -9.227,	loss: 67.476

i: 109,	target: -0.755,	output: -9.227,	loss: 71.770
i: 110,	target: -0.698,	output: -9.227,	loss: 72.743
i: 111,	target: -0.758,	output: -9.227,	loss: 71.734
i: 112,	target: -1.649,	output: -9.227,	loss: 57.428
i: 113,	target: -1.450,	output: -9.227,	loss: 60.478
i: 114,	target: -0.754,	output: -9.227,	loss: 71.795
i: 115,	target: -1.036,	output: -9.227,	loss: 67.101
i: 116,	target: -0.716,	output: -9.227,	loss: 72.431
i: 117,	target: -0.681,	output: -9.227,	loss: 73.029
i: 118,	target: -1.073,	output: -9.227,	loss: 66.488
i: 119,	target: -1.029,	output: -9.227,	loss: 67.206
i: 120,	target: -1.027,	output: -9.227,	loss: 67.248
i: 121,	target: -0.722,	output: -9.227,	loss: 72.330
i: 122,	target: -0.964,	output: -9.227,	loss: 68.279
i: 123,	target: -1.959,	output: -9.227,	loss: 52.820
i: 124,	target: -1.584,	output: -9.227,	loss: 58.413
i: 125,	target: -1.935,	output: -9.227,	loss: 53.173
i: 126,	target: -0.827,	output: -9.227,	loss: 70.564
i: 127,	target: -0.657,	output: -9.227,	loss: 73.442
i: 128,	target: -1.477,	output: -9.227,	loss: 60.060
i: 129,	target: 0.321,	output: -9.227,	loss: 91.161
i: 130,	target: 9.163,	output: -9.227,	loss: 338.208
i: 131,	target: -0.534,	output: -9.227,	loss: 75.577
i: 132,	target: -2.103,	output: -9.227,	loss: 50.752
i: 133,	target: -1.003,	output: -9.227,	loss: 67.638
i: 134,	target: -0.536,	output: -9.227,	loss: 75.533
i: 135,	target: -0.446,	output: -9.227,	loss: 77.108
i: 136,	target: -0.633,	output: -9.227,	loss: 73.864
i: 137,	target: -0.180,	output: -9.227,	loss: 81.859
i: 138,	target: -0.687,	output: -9.227,	loss: 72.931
i: 139,	target: -1.880,	output: -9.227,	loss: 53.981
i: 140,	target: -1.773,	output: -9.227,	loss: 55.569
i: 141,	target: -0.874,	output: -9.227,	loss: 69.769
i: 142,	target: -0.839,	output: -9.227,	loss: 70.362
i: 143,	target: -1.351,	output: -9.227,	loss: 62.032
i: 144,	target: -1.610,	output: -9.227,	loss: 58.027
i: 145,	target: -1.353,	output: -9.227,	loss: 62.009
i: 146,	target: -3.055,	output: -9.227,	loss: 38.089
i: 147,	target: -0.722,	output: -9.227,	loss: 72.344
i: 148,	target: -0.927,	output: -9.227,	loss: 68.897
i: 149,	target: -0.720,	output: -9.227,	loss: 72.369
i: 150,	target: -1.403,	output: -9.227,	loss: 61.212
i: 151,	target: -1.328,	output: -9.227,	loss: 62.391
i: 152,	target: -2.297,	output: -9.227,	loss: 48.031
i: 153,	target: -1.406,	output: -9.227,	loss: 61.166
i: 154,	target: -0.514,	output: -9.227,	loss: 75.924
i: 155,	target: -1.502,	output: -9.227,	loss: 59.681
i: 156,	target: -1.411,	output: -9.227,	loss: 61.088

i: 157,	target: -0.619,	output: -9.227,	loss: 74.106
i: 158,	target: -1.426,	output: -9.227,	loss: 60.861
i: 159,	target: -0.694,	output: -9.227,	loss: 72.809
i: 160,	target: -2.249,	output: -9.227,	loss: 48.690
i: 161,	target: -1.196,	output: -9.227,	loss: 64.492
i: 162,	target: -0.798,	output: -9.227,	loss: 71.048
i: 163,	target: -1.074,	output: -9.227,	loss: 66.473
i: 164,	target: -0.595,	output: -9.227,	loss: 74.510
i: 165,	target: -0.730,	output: -9.227,	loss: 72.200
i: 166,	target: 8.930,	output: -9.227,	loss: 329.696
i: 167,	target: 9.495,	output: -9.227,	loss: 350.529
i: 168,	target: -1.306,	output: -9.227,	loss: 62.740
i: 169,	target: -1.133,	output: -9.227,	loss: 65.517
i: 170,	target: 0.553,	output: -9.227,	loss: 95.659
i: 171,	target: -0.948,	output: -9.227,	loss: 68.538
i: 172,	target: -1.674,	output: -9.227,	loss: 57.043
i: 173,	target: -0.101,	output: -9.227,	loss: 83.283
i: 174,	target: -0.547,	output: -9.227,	loss: 75.350
i: 175,	target: -0.559,	output: -9.227,	loss: 75.130
i: 176,	target: 0.067,	output: -9.227,	loss: 86.384
i: 177,	target: -1.316,	output: -9.227,	loss: 62.588
i: 178,	target: -1.338,	output: -9.227,	loss: 62.234
i: 179,	target: -1.655,	output: -9.227,	loss: 57.337
i: 180,	target: -1.149,	output: -9.227,	loss: 65.257
i: 181,	target: 0.139,	output: -9.227,	loss: 87.723
i: 182,	target: 0.096,	output: -9.227,	loss: 86.915
i: 183,	target: -1.020,	output: -9.227,	loss: 67.353
i: 184,	target: -1.433,	output: -9.227,	loss: 60.755
i: 185,	target: -0.344,	output: -9.227,	loss: 78.903
i: 186,	target: -2.679,	output: -9.227,	loss: 42.883
i: 187,	target: -1.151,	output: -9.227,	loss: 65.221
i: 188,	target: -0.819,	output: -9.227,	loss: 70.690
i: 189,	target: -0.772,	output: -9.227,	loss: 71.489
i: 190,	target: -0.606,	output: -9.227,	loss: 74.331
i: 191,	target: -1.174,	output: -9.227,	loss: 64.853
i: 192,	target: -1.896,	output: -9.227,	loss: 53.744
i: 193,	target: -1.217,	output: -9.227,	loss: 64.166
i: 194,	target: -1.208,	output: -9.227,	loss: 64.298
i: 195,	target: -0.082,	output: -9.227,	loss: 83.630
i: 196,	target: -1.059,	output: -9.227,	loss: 66.720
i: 197,	target: -0.465,	output: -9.227,	loss: 76.771
i: 198,	target: -0.578,	output: -9.227,	loss: 74.809
i: 199,	target: -1.137,	output: -9.227,	loss: 65.449
i: 200,	target: -1.382,	output: -9.227,	loss: 61.550
i: 201,	target: -0.596,	output: -9.227,	loss: 74.496
i: 202,	target: -0.699,	output: -9.227,	loss: 72.724
i: 203,	target: -1.425,	output: -9.227,	loss: 60.868
i: 204,	target: -0.098,	output: -9.227,	loss: 83.340

i: 205,	target: -0.594,	output: -9.227,	loss: 74.535
i: 206,	target: -1.287,	output: -9.227,	loss: 63.046
i: 207,	target: -0.779,	output: -9.227,	loss: 71.376
i: 208,	target: -0.711,	output: -9.227,	loss: 72.530
i: 209,	target: -1.262,	output: -9.227,	loss: 63.442
i: 210,	target: -1.586,	output: -9.227,	loss: 58.392
i: 211,	target: -0.623,	output: -9.227,	loss: 74.039
i: 212,	target: -1.496,	output: -9.227,	loss: 59.763
i: 213,	target: -0.885,	output: -9.227,	loss: 69.595
i: 214,	target: -0.542,	output: -9.227,	loss: 75.432
i: 215,	target: -1.082,	output: -9.227,	loss: 66.341
i: 216,	target: -1.604,	output: -9.227,	loss: 58.106
i: 217,	target: -0.883,	output: -9.227,	loss: 69.624
i: 218,	target: -0.990,	output: -9.227,	loss: 67.854
i: 219,	target: -2.458,	output: -9.227,	loss: 45.818
i: 220,	target: 0.206,	output: -9.227,	loss: 88.974
i: 221,	target: -1.270,	output: -9.227,	loss: 63.310
i: 222,	target: -0.511,	output: -9.227,	loss: 75.978
i: 223,	target: -2.259,	output: -9.227,	loss: 48.559
i: 224,	target: 9.640,	output: -9.227,	loss: 355.956
i: 225,	target: -0.323,	output: -9.227,	loss: 79.278
i: 226,	target: -1.200,	output: -9.227,	loss: 64.441
i: 227,	target: -1.413,	output: -9.227,	loss: 61.058
i: 228,	target: -1.080,	output: -9.227,	loss: 66.371
i: 229,	target: -0.740,	output: -9.227,	loss: 72.026
i: 230,	target: 0.756,	output: -9.227,	loss: 99.663
i: 231,	target: -0.324,	output: -9.227,	loss: 79.265
i: 232,	target: -0.951,	output: -9.227,	loss: 68.492
i: 233,	target: -1.086,	output: -9.227,	loss: 66.281
i: 234,	target: -1.310,	output: -9.227,	loss: 62.686
i: 235,	target: -1.970,	output: -9.227,	loss: 52.667
i: 236,	target: -1.509,	output: -9.227,	loss: 59.573
i: 237,	target: 0.607,	output: -9.227,	loss: 96.717
i: 238,	target: -0.384,	output: -9.227,	loss: 78.203
i: 239,	target: -1.312,	output: -9.227,	loss: 62.654
i: 240,	target: -1.578,	output: -9.227,	loss: 58.514
i: 241,	target: -1.273,	output: -9.227,	loss: 63.268
i: 242,	target: -1.636,	output: -9.227,	loss: 57.630
i: 243,	target: -0.279,	output: -9.227,	loss: 80.074
i: 244,	target: -1.703,	output: -9.227,	loss: 56.606
i: 245,	target: -0.573,	output: -9.227,	loss: 74.895
i: 246,	target: 9.832,	output: -9.227,	loss: 363.232
i: 247,	target: -1.408,	output: -9.227,	loss: 61.141
i: 248,	target: -1.952,	output: -9.227,	loss: 52.933
i: 249,	target: -0.863,	output: -9.227,	loss: 69.952
i: 250,	target: -1.347,	output: -9.227,	loss: 62.103
i: 251,	target: -1.404,	output: -9.227,	loss: 61.206
i: 252,	target: -1.048,	output: -9.227,	loss: 66.890

i: 253,	target: -1.163,	output: -9.227,	loss: 65.033
i: 254,	target: -1.435,	output: -9.227,	loss: 60.722
i: 255,	target: -1.339,	output: -9.227,	loss: 62.215
i: 256,	target: -0.565,	output: -9.227,	loss: 75.037
i: 257,	target: -0.550,	output: -9.227,	loss: 75.297
i: 258,	target: -1.088,	output: -9.227,	loss: 66.242
i: 259,	target: -1.248,	output: -9.227,	loss: 63.664
i: 260,	target: -1.969,	output: -9.227,	loss: 52.681
i: 261,	target: -0.861,	output: -9.227,	loss: 69.995
i: 262,	target: -0.583,	output: -9.227,	loss: 74.718
i: 263,	target: -0.484,	output: -9.227,	loss: 76.447
i: 264,	target: -0.732,	output: -9.227,	loss: 72.164
i: 265,	target: -1.664,	output: -9.227,	loss: 57.195
i: 266,	target: -0.473,	output: -9.227,	loss: 76.632
i: 267,	target: -1.561,	output: -9.227,	loss: 58.771
i: 268,	target: 0.163,	output: -9.227,	loss: 88.177
i: 269,	target: -2.107,	output: -9.227,	loss: 50.695
i: 270,	target: -0.547,	output: -9.227,	loss: 75.347
i: 271,	target: -1.263,	output: -9.227,	loss: 63.429
i: 272,	target: -0.567,	output: -9.227,	loss: 74.998
i: 273,	target: -0.344,	output: -9.227,	loss: 78.911
i: 274,	target: -1.217,	output: -9.227,	loss: 64.161
i: 275,	target: -0.719,	output: -9.227,	loss: 72.382
i: 276,	target: -1.339,	output: -9.227,	loss: 62.218
i: 277,	target: -0.370,	output: -9.227,	loss: 78.451
i: 278,	target: -0.776,	output: -9.227,	loss: 71.420
i: 279,	target: -1.648,	output: -9.227,	loss: 57.441
i: 280,	target: -0.609,	output: -9.227,	loss: 74.265
i: 281,	target: -0.997,	output: -9.227,	loss: 67.742
i: 282,	target: -0.599,	output: -9.227,	loss: 74.450
i: 283,	target: -1.372,	output: -9.227,	loss: 61.701
i: 284,	target: -0.956,	output: -9.227,	loss: 68.415
i: 285,	target: -2.026,	output: -9.227,	loss: 51.849
i: 286,	target: -1.584,	output: -9.227,	loss: 58.416
i: 287,	target: -1.314,	output: -9.227,	loss: 62.613
i: 288,	target: -0.533,	output: -9.227,	loss: 75.590
i: 289,	target: -1.704,	output: -9.227,	loss: 56.599
i: 290,	target: -1.466,	output: -9.227,	loss: 60.231
i: 291,	target: -0.793,	output: -9.227,	loss: 71.133
i: 292,	target: -1.183,	output: -9.227,	loss: 64.706
i: 293,	target: -0.667,	output: -9.227,	loss: 73.283
i: 294,	target: -0.588,	output: -9.227,	loss: 74.640
i: 295,	target: -0.614,	output: -9.227,	loss: 74.181
i: 296,	target: -1.129,	output: -9.227,	loss: 65.584
i: 297,	target: 0.390,	output: -9.227,	loss: 92.493
i: 298,	target: 9.259,	output: -9.227,	loss: 341.754
i: 299,	target: 0.616,	output: -9.227,	loss: 96.893
i: 300,	target: -1.220,	output: -9.227,	loss: 64.112

i: 301,	target: 9.686,	output: -9.227,	loss: 357.687
i: 302,	target: -1.176,	output: -9.227,	loss: 64.817
i: 303,	target: -1.419,	output: -9.227,	loss: 60.962
i: 304,	target: -0.427,	output: -9.227,	loss: 77.445
i: 305,	target: -1.659,	output: -9.227,	loss: 57.270
i: 306,	target: -0.803,	output: -9.227,	loss: 70.959
i: 307,	target: -0.724,	output: -9.227,	loss: 72.298
i: 308,	target: -1.423,	output: -9.227,	loss: 60.897
i: 309,	target: -0.527,	output: -9.227,	loss: 75.685
i: 310,	target: -0.350,	output: -9.227,	loss: 78.799
i: 311,	target: -0.466,	output: -9.227,	loss: 76.760
i: 312,	target: -0.918,	output: -9.227,	loss: 69.041
i: 313,	target: -0.865,	output: -9.227,	loss: 69.925
i: 314,	target: -1.295,	output: -9.227,	loss: 62.924
i: 315,	target: -0.964,	output: -9.227,	loss: 68.277
i: 316,	target: -0.897,	output: -9.227,	loss: 69.397
i: 317,	target: -1.771,	output: -9.227,	loss: 55.596
i: 318,	target: -1.275,	output: -9.227,	loss: 63.228
i: 319,	target: -0.528,	output: -9.227,	loss: 75.681
i: 320,	target: 0.183,	output: -9.227,	loss: 88.553
i: 321,	target: -0.695,	output: -9.227,	loss: 72.796
i: 322,	target: -1.386,	output: -9.227,	loss: 61.481
i: 323,	target: -1.646,	output: -9.227,	loss: 57.480
i: 324,	target: 9.525,	output: -9.227,	loss: 351.630
i: 325,	target: -1.577,	output: -9.227,	loss: 58.518
i: 326,	target: -0.661,	output: -9.227,	loss: 73.381
i: 327,	target: -0.754,	output: -9.227,	loss: 71.793
i: 328,	target: -0.443,	output: -9.227,	loss: 77.155
i: 329,	target: -0.813,	output: -9.227,	loss: 70.790
i: 330,	target: 9.649,	output: -9.227,	loss: 356.302
i: 331,	target: -0.780,	output: -9.227,	loss: 71.360
i: 332,	target: -0.068,	output: -9.227,	loss: 83.890
i: 333,	target: -1.034,	output: -9.227,	loss: 67.125
i: 334,	target: -1.016,	output: -9.227,	loss: 67.416
i: 335,	target: -1.012,	output: -9.227,	loss: 67.494
i: 336,	target: -0.988,	output: -9.227,	loss: 67.881
i: 337,	target: -0.952,	output: -9.227,	loss: 68.481
i: 338,	target: -0.386,	output: -9.227,	loss: 78.171
i: 339,	target: -0.484,	output: -9.227,	loss: 76.447
i: 340,	target: 9.132,	output: -9.227,	loss: 337.039
i: 341,	target: -0.707,	output: -9.227,	loss: 72.589
i: 342,	target: -0.470,	output: -9.227,	loss: 76.693
i: 343,	target: -0.859,	output: -9.227,	loss: 70.018
i: 344,	target: -1.096,	output: -9.227,	loss: 66.111
i: 345,	target: -0.707,	output: -9.227,	loss: 72.586
i: 346,	target: -1.267,	output: -9.227,	loss: 63.357
i: 347,	target: -1.072,	output: -9.227,	loss: 66.505
i: 348,	target: -1.309,	output: -9.227,	loss: 62.692

i: 349,	target: 0.552,	output: -9.227,	loss: 95.624
i: 350,	target: -0.782,	output: -9.227,	loss: 71.313
i: 351,	target: -0.798,	output: -9.227,	loss: 71.050
i: 352,	target: -1.212,	output: -9.227,	loss: 64.243
i: 353,	target: -0.635,	output: -9.227,	loss: 73.828
i: 354,	target: -1.522,	output: -9.227,	loss: 59.373
i: 355,	target: -1.251,	output: -9.227,	loss: 63.614
i: 356,	target: -0.872,	output: -9.227,	loss: 69.814
i: 357,	target: -1.729,	output: -9.227,	loss: 56.225
i: 358,	target: -2.087,	output: -9.227,	loss: 50.987
i: 359,	target: -0.648,	output: -9.227,	loss: 73.594
i: 360,	target: -0.739,	output: -9.227,	loss: 72.041
i: 361,	target: -1.175,	output: -9.227,	loss: 64.830
i: 362,	target: 9.618,	output: -9.227,	loss: 355.129
i: 363,	target: -0.678,	output: -9.227,	loss: 73.089
i: 364,	target: -0.570,	output: -9.227,	loss: 74.952
i: 365,	target: -0.992,	output: -9.227,	loss: 67.809
i: 366,	target: -0.500,	output: -9.227,	loss: 76.170
i: 367,	target: -0.799,	output: -9.227,	loss: 71.030
i: 368,	target: -0.334,	output: -9.227,	loss: 79.093
i: 369,	target: -1.011,	output: -9.227,	loss: 67.502
i: 370,	target: -0.731,	output: -9.227,	loss: 72.185
i: 371,	target: -0.696,	output: -9.227,	loss: 72.786
i: 372,	target: -1.061,	output: -9.227,	loss: 66.689
i: 373,	target: -1.113,	output: -9.227,	loss: 65.834
i: 374,	target: -2.097,	output: -9.227,	loss: 50.833
i: 375,	target: -1.448,	output: -9.227,	loss: 60.512
i: 376,	target: -1.523,	output: -9.227,	loss: 59.349
i: 377,	target: -0.536,	output: -9.227,	loss: 75.530
i: 378,	target: -1.198,	output: -9.227,	loss: 64.469
i: 379,	target: -1.367,	output: -9.227,	loss: 61.787
i: 380,	target: -1.455,	output: -9.227,	loss: 60.403
i: 381,	target: -1.032,	output: -9.227,	loss: 67.157
i: 382,	target: 9.351,	output: -9.227,	loss: 345.158
i: 383,	target: -1.992,	output: -9.227,	loss: 52.349
i: 384,	target: -0.451,	output: -9.227,	loss: 77.018
i: 385,	target: -1.583,	output: -9.227,	loss: 58.437
i: 386,	target: -0.692,	output: -9.227,	loss: 72.852
i: 387,	target: -0.693,	output: -9.227,	loss: 72.836
i: 388,	target: 8.939,	output: -9.227,	loss: 330.007
i: 389,	target: 0.421,	output: -9.227,	loss: 93.093
i: 390,	target: -0.729,	output: -9.227,	loss: 72.214
i: 391,	target: -0.655,	output: -9.227,	loss: 73.476
i: 392,	target: -1.546,	output: -9.227,	loss: 58.996
i: 393,	target: -1.038,	output: -9.227,	loss: 67.064
i: 394,	target: 8.441,	output: -9.227,	loss: 312.176
i: 395,	target: 9.791,	output: -9.227,	loss: 361.703
i: 396,	target: -0.043,	output: -9.227,	loss: 84.347

i: 397,	target: -1.405,	output: -9.227,	loss: 61.181
i: 398,	target: -0.625,	output: -9.227,	loss: 73.992
i: 399,	target: -1.358,	output: -9.227,	loss: 61.927
i: 400,	target: -0.724,	output: -9.227,	loss: 72.307
i: 401,	target: -0.809,	output: -9.227,	loss: 70.867
i: 402,	target: -1.413,	output: -9.227,	loss: 61.056
i: 403,	target: -0.626,	output: -9.227,	loss: 73.974
i: 404,	target: -1.382,	output: -9.227,	loss: 61.542
i: 405,	target: -1.046,	output: -9.227,	loss: 66.928
i: 406,	target: -1.239,	output: -9.227,	loss: 63.806
i: 407,	target: -0.540,	output: -9.227,	loss: 75.457
i: 408,	target: -1.735,	output: -9.227,	loss: 56.135
i: 409,	target: -1.163,	output: -9.227,	loss: 65.028
i: 410,	target: -2.005,	output: -9.227,	loss: 52.165
i: 411,	target: -0.647,	output: -9.227,	loss: 73.617
i: 412,	target: -1.568,	output: -9.227,	loss: 58.666
i: 413,	target: -1.729,	output: -9.227,	loss: 56.224
i: 414,	target: 9.275,	output: -9.227,	loss: 342.332
i: 415,	target: -0.860,	output: -9.227,	loss: 70.013
i: 416,	target: -0.843,	output: -9.227,	loss: 70.287
i: 417,	target: 8.834,	output: -9.227,	loss: 326.210
i: 418,	target: -0.548,	output: -9.227,	loss: 75.326
i: 419,	target: -0.653,	output: -9.227,	loss: 73.508
i: 420,	target: -0.619,	output: -9.227,	loss: 74.103
i: 421,	target: -1.225,	output: -9.227,	loss: 64.031
i: 422,	target: -1.294,	output: -9.227,	loss: 62.935
i: 423,	target: -1.974,	output: -9.227,	loss: 52.602
i: 424,	target: -1.968,	output: -9.227,	loss: 52.693
i: 425,	target: -0.805,	output: -9.227,	loss: 70.927
i: 426,	target: -1.277,	output: -9.227,	loss: 63.207
i: 427,	target: -0.733,	output: -9.227,	loss: 72.158
i: 428,	target: -0.524,	output: -9.227,	loss: 75.739
i: 429,	target: -1.324,	output: -9.227,	loss: 62.454
i: 430,	target: -0.838,	output: -9.227,	loss: 70.372
i: 431,	target: -1.125,	output: -9.227,	loss: 65.640
i: 432,	target: -1.260,	output: -9.227,	loss: 63.471
i: 433,	target: -0.832,	output: -9.227,	loss: 70.471
i: 434,	target: -1.357,	output: -9.227,	loss: 61.946
i: 435,	target: -0.886,	output: -9.227,	loss: 69.582
i: 436,	target: -1.297,	output: -9.227,	loss: 62.891
i: 437,	target: -0.571,	output: -9.227,	loss: 74.921
i: 438,	target: -0.756,	output: -9.227,	loss: 71.760
i: 439,	target: 0.692,	output: -9.227,	loss: 98.380
i: 440,	target: -0.421,	output: -9.227,	loss: 77.542
i: 441,	target: -0.423,	output: -9.227,	loss: 77.509
i: 442,	target: -0.533,	output: -9.227,	loss: 75.580
i: 443,	target: -1.623,	output: -9.227,	loss: 57.817
i: 444,	target: -2.384,	output: -9.227,	loss: 46.829

i: 445,	target: -0.968,	output: -9.227,	loss: 68.212
i: 446,	target: -1.464,	output: -9.227,	loss: 60.263
i: 447,	target: -0.259,	output: -9.227,	loss: 80.431
i: 448,	target: -1.073,	output: -9.227,	loss: 66.486
i: 449,	target: -1.347,	output: -9.227,	loss: 62.102
i: 450,	target: -1.941,	output: -9.227,	loss: 53.086
i: 451,	target: -0.622,	output: -9.227,	loss: 74.054
i: 452,	target: -0.502,	output: -9.227,	loss: 76.120
i: 453,	target: -0.590,	output: -9.227,	loss: 74.594
i: 454,	target: -0.715,	output: -9.227,	loss: 72.455
i: 455,	target: -1.176,	output: -9.227,	loss: 64.827
i: 456,	target: -1.016,	output: -9.227,	loss: 67.430
i: 457,	target: 9.072,	output: -9.227,	loss: 334.864
i: 458,	target: -1.919,	output: -9.227,	loss: 53.405
i: 459,	target: -1.465,	output: -9.227,	loss: 60.244
i: 460,	target: -0.767,	output: -9.227,	loss: 71.566
i: 461,	target: -1.847,	output: -9.227,	loss: 54.459
i: 462,	target: -1.343,	output: -9.227,	loss: 62.161
i: 463,	target: -0.863,	output: -9.227,	loss: 69.956
i: 464,	target: -0.715,	output: -9.227,	loss: 72.448
i: 465,	target: -0.983,	output: -9.227,	loss: 67.967
i: 466,	target: -1.202,	output: -9.227,	loss: 64.396
i: 467,	target: -1.294,	output: -9.227,	loss: 62.938
i: 468,	target: -1.139,	output: -9.227,	loss: 65.421
i: 469,	target: 9.351,	output: -9.227,	loss: 345.158
i: 470,	target: -0.580,	output: -9.227,	loss: 74.776
i: 471,	target: 9.063,	output: -9.227,	loss: 334.535
i: 472,	target: -1.622,	output: -9.227,	loss: 57.834
i: 473,	target: -0.359,	output: -9.227,	loss: 78.648
i: 474,	target: -0.446,	output: -9.227,	loss: 77.104
i: 475,	target: -0.295,	output: -9.227,	loss: 79.783
i: 476,	target: -1.667,	output: -9.227,	loss: 57.160
i: 477,	target: 8.420,	output: -9.227,	loss: 311.415
i: 478,	target: -0.652,	output: -9.227,	loss: 73.528
i: 479,	target: -1.272,	output: -9.227,	loss: 63.289
i: 480,	target: -1.654,	output: -9.227,	loss: 57.354
i: 481,	target: -1.148,	output: -9.227,	loss: 65.270
i: 482,	target: -0.655,	output: -9.227,	loss: 73.476
i: 483,	target: -1.611,	output: -9.227,	loss: 58.012
i: 484,	target: -0.270,	output: -9.227,	loss: 80.235
i: 485,	target: -0.364,	output: -9.227,	loss: 78.551
i: 486,	target: -1.471,	output: -9.227,	loss: 60.161
i: 487,	target: -0.428,	output: -9.227,	loss: 77.430
i: 488,	target: -0.873,	output: -9.227,	loss: 69.794
i: 489,	target: -0.825,	output: -9.227,	loss: 70.591
i: 490,	target: -0.621,	output: -9.227,	loss: 74.071
i: 491,	target: -0.961,	output: -9.227,	loss: 68.323
i: 492,	target: -0.627,	output: -9.227,	loss: 73.961

i: 493,	target: -1.721,	output: -9.227,	loss: 56.341
i: 494,	target: -1.624,	output: -9.227,	loss: 57.801
i: 495,	target: -0.312,	output: -9.227,	loss: 79.471
i: 496,	target: -0.481,	output: -9.227,	loss: 76.499
i: 497,	target: -0.200,	output: -9.227,	loss: 81.493
i: 498,	target: -0.674,	output: -9.227,	loss: 73.150
i: 499,	target: -0.453,	output: -9.227,	loss: 76.988
i: 500,	target: -1.122,	output: -9.227,	loss: 65.699
i: 501,	target: 8.936,	output: -9.227,	loss: 329.902
i: 502,	target: -0.773,	output: -9.227,	loss: 71.475
i: 503,	target: -0.559,	output: -9.227,	loss: 75.137
i: 504,	target: 9.153,	output: -9.227,	loss: 337.826
i: 505,	target: -1.487,	output: -9.227,	loss: 59.905
i: 506,	target: -0.512,	output: -9.227,	loss: 75.952
i: 507,	target: -0.382,	output: -9.227,	loss: 78.237
i: 508,	target: -1.960,	output: -9.227,	loss: 52.811
i: 509,	target: -0.933,	output: -9.227,	loss: 68.787
i: 510,	target: -0.858,	output: -9.227,	loss: 70.042
i: 511,	target: -1.140,	output: -9.227,	loss: 65.400
i: 512,	target: -1.104,	output: -9.227,	loss: 65.980
i: 513,	target: -0.839,	output: -9.227,	loss: 70.367
i: 514,	target: -0.894,	output: -9.227,	loss: 69.439
i: 515,	target: 0.750,	output: -9.227,	loss: 99.540
i: 516,	target: -0.956,	output: -9.227,	loss: 68.414
i: 517,	target: -0.608,	output: -9.227,	loss: 74.286
i: 518,	target: -0.535,	output: -9.227,	loss: 75.547
i: 519,	target: -0.724,	output: -9.227,	loss: 72.307
i: 520,	target: -0.078,	output: -9.227,	loss: 83.702
i: 521,	target: -1.238,	output: -9.227,	loss: 63.830
i: 522,	target: 0.858,	output: -9.227,	loss: 101.715
i: 523,	target: -1.346,	output: -9.227,	loss: 62.107
i: 524,	target: -1.594,	output: -9.227,	loss: 58.260
i: 525,	target: -1.428,	output: -9.227,	loss: 60.822
i: 526,	target: 0.602,	output: -9.227,	loss: 96.605
i: 527,	target: -1.035,	output: -9.227,	loss: 67.106
i: 528,	target: 9.568,	output: -9.227,	loss: 353.243
i: 529,	target: -1.433,	output: -9.227,	loss: 60.747
i: 530,	target: -1.455,	output: -9.227,	loss: 60.405
i: 531,	target: -1.918,	output: -9.227,	loss: 53.428
i: 532,	target: -0.797,	output: -9.227,	loss: 71.059
i: 533,	target: -0.597,	output: -9.227,	loss: 74.486
i: 534,	target: -1.008,	output: -9.227,	loss: 67.555
i: 535,	target: -1.282,	output: -9.227,	loss: 63.122
i: 536,	target: -1.225,	output: -9.227,	loss: 64.030
i: 537,	target: -1.591,	output: -9.227,	loss: 58.304
i: 538,	target: -0.442,	output: -9.227,	loss: 77.181
i: 539,	target: -0.346,	output: -9.227,	loss: 78.880
i: 540,	target: -1.539,	output: -9.227,	loss: 59.104

i: 541,	target: -1.223,	output: -9.227,	loss: 64.061
i: 542,	target: -0.210,	output: -9.227,	loss: 81.315
i: 543,	target: -1.621,	output: -9.227,	loss: 57.859
i: 544,	target: -0.986,	output: -9.227,	loss: 67.915
i: 545,	target: -1.392,	output: -9.227,	loss: 61.392
i: 546,	target: -0.439,	output: -9.227,	loss: 77.236
i: 547,	target: -0.849,	output: -9.227,	loss: 70.198
i: 548,	target: -0.604,	output: -9.227,	loss: 74.359
i: 549,	target: -0.690,	output: -9.227,	loss: 72.880
i: 550,	target: -0.683,	output: -9.227,	loss: 73.008
i: 551,	target: -0.684,	output: -9.227,	loss: 72.982
i: 552,	target: -0.656,	output: -9.227,	loss: 73.456
i: 553,	target: -0.609,	output: -9.227,	loss: 74.272
i: 554,	target: -2.826,	output: -9.227,	loss: 40.973
i: 555,	target: -0.586,	output: -9.227,	loss: 74.677
i: 556,	target: -1.436,	output: -9.227,	loss: 60.697
i: 557,	target: -1.583,	output: -9.227,	loss: 58.433
i: 558,	target: -0.691,	output: -9.227,	loss: 72.861
i: 559,	target: -0.679,	output: -9.227,	loss: 73.071
i: 560,	target: -1.468,	output: -9.227,	loss: 60.197
i: 561,	target: -1.137,	output: -9.227,	loss: 65.444
i: 562,	target: -0.843,	output: -9.227,	loss: 70.292
i: 563,	target: 9.476,	output: -9.227,	loss: 349.799
i: 564,	target: -1.585,	output: -9.227,	loss: 58.409
i: 565,	target: -1.205,	output: -9.227,	loss: 64.362
i: 566,	target: -1.504,	output: -9.227,	loss: 59.644
i: 567,	target: 8.413,	output: -9.227,	loss: 311.188
i: 568,	target: -0.784,	output: -9.227,	loss: 71.281
i: 569,	target: -1.271,	output: -9.227,	loss: 63.299
i: 570,	target: 9.487,	output: -9.227,	loss: 350.229
i: 571,	target: -1.294,	output: -9.227,	loss: 62.942
i: 572,	target: -0.757,	output: -9.227,	loss: 71.750
i: 573,	target: -1.189,	output: -9.227,	loss: 64.606
i: 574,	target: -3.391,	output: -9.227,	loss: 34.064
i: 575,	target: -2.099,	output: -9.227,	loss: 50.817
i: 576,	target: -0.481,	output: -9.227,	loss: 76.495
i: 577,	target: -0.852,	output: -9.227,	loss: 70.146
i: 578,	target: -0.486,	output: -9.227,	loss: 76.406
i: 579,	target: -1.310,	output: -9.227,	loss: 62.688
i: 580,	target: -1.290,	output: -9.227,	loss: 62.991
i: 581,	target: -0.965,	output: -9.227,	loss: 68.265
i: 582,	target: -1.808,	output: -9.227,	loss: 55.042
i: 583,	target: 0.055,	output: -9.227,	loss: 86.157
i: 584,	target: -2.066,	output: -9.227,	loss: 51.275
i: 585,	target: -0.462,	output: -9.227,	loss: 76.826
i: 586,	target: -0.860,	output: -9.227,	loss: 70.004
i: 587,	target: -1.080,	output: -9.227,	loss: 66.372
i: 588,	target: -0.800,	output: -9.227,	loss: 71.012

i: 589,	target: -1.023,	output: -9.227,	loss: 67.299
i: 590,	target: 0.702,	output: -9.227,	loss: 98.580
i: 591,	target: -1.456,	output: -9.227,	loss: 60.395
i: 592,	target: -0.667,	output: -9.227,	loss: 73.273
i: 593,	target: -0.560,	output: -9.227,	loss: 75.115
i: 594,	target: -1.348,	output: -9.227,	loss: 62.085
i: 595,	target: -1.164,	output: -9.227,	loss: 65.017
i: 596,	target: -1.574,	output: -9.227,	loss: 58.576
i: 597,	target: 0.451,	output: -9.227,	loss: 93.661
i: 598,	target: -1.401,	output: -9.227,	loss: 61.242
i: 599,	target: -2.111,	output: -9.227,	loss: 50.642
i: 600,	target: -0.682,	output: -9.227,	loss: 73.025
i: 601,	target: -1.254,	output: -9.227,	loss: 63.568
i: 602,	target: -1.644,	output: -9.227,	loss: 57.509
i: 603,	target: -1.413,	output: -9.227,	loss: 61.061
i: 604,	target: -1.076,	output: -9.227,	loss: 66.438
i: 605,	target: -0.786,	output: -9.227,	loss: 71.245
i: 606,	target: -0.751,	output: -9.227,	loss: 71.853
i: 607,	target: -1.193,	output: -9.227,	loss: 64.542
i: 608,	target: -0.431,	output: -9.227,	loss: 77.379
i: 609,	target: -1.575,	output: -9.227,	loss: 58.556
i: 610,	target: -2.230,	output: -9.227,	loss: 48.960
i: 611,	target: -0.111,	output: -9.227,	loss: 83.108
i: 612,	target: -1.104,	output: -9.227,	loss: 65.979
i: 613,	target: -1.276,	output: -9.227,	loss: 63.223
i: 614,	target: -0.745,	output: -9.227,	loss: 71.951
i: 615,	target: -0.464,	output: -9.227,	loss: 76.784
i: 616,	target: -1.558,	output: -9.227,	loss: 58.818
i: 617,	target: -0.241,	output: -9.227,	loss: 80.746
i: 618,	target: -1.230,	output: -9.227,	loss: 63.946
i: 619,	target: -1.423,	output: -9.227,	loss: 60.900
i: 620,	target: -0.883,	output: -9.227,	loss: 69.629
i: 621,	target: -0.442,	output: -9.227,	loss: 77.178
i: 622,	target: -1.481,	output: -9.227,	loss: 60.007
i: 623,	target: -1.372,	output: -9.227,	loss: 61.708
i: 624,	target: -0.913,	output: -9.227,	loss: 69.120
i: 625,	target: -1.309,	output: -9.227,	loss: 62.691
i: 626,	target: -0.481,	output: -9.227,	loss: 76.501
i: 627,	target: -0.936,	output: -9.227,	loss: 68.746
i: 628,	target: -0.625,	output: -9.227,	loss: 74.002
i: 629,	target: -2.111,	output: -9.227,	loss: 50.632
i: 630,	target: -0.615,	output: -9.227,	loss: 74.174
i: 631,	target: -1.835,	output: -9.227,	loss: 54.637
i: 632,	target: -1.398,	output: -9.227,	loss: 61.290
i: 633,	target: -0.939,	output: -9.227,	loss: 68.686
i: 634,	target: -0.041,	output: -9.227,	loss: 84.387
i: 635,	target: -0.624,	output: -9.227,	loss: 74.010
i: 636,	target: -1.073,	output: -9.227,	loss: 66.487

i: 637,	target: -0.240,	output: -9.227,	loss: 80.761
i: 638,	target: -0.921,	output: -9.227,	loss: 68.994
i: 639,	target: -2.098,	output: -9.227,	loss: 50.818
i: 640,	target: -0.395,	output: -9.227,	loss: 78.009
i: 641,	target: -1.360,	output: -9.227,	loss: 61.890
i: 642,	target: -1.162,	output: -9.227,	loss: 65.046
i: 643,	target: -0.952,	output: -9.227,	loss: 68.480
i: 644,	target: -0.958,	output: -9.227,	loss: 68.375
i: 645,	target: -1.132,	output: -9.227,	loss: 65.527
i: 646,	target: -0.695,	output: -9.227,	loss: 72.796
i: 647,	target: -0.561,	output: -9.227,	loss: 75.104
i: 648,	target: -0.502,	output: -9.227,	loss: 76.121
i: 649,	target: 0.702,	output: -9.227,	loss: 98.596
i: 650,	target: -1.508,	output: -9.227,	loss: 59.582
i: 651,	target: -1.395,	output: -9.227,	loss: 61.349
i: 652,	target: -1.871,	output: -9.227,	loss: 54.115
i: 653,	target: -1.157,	output: -9.227,	loss: 65.128
i: 654,	target: -0.663,	output: -9.227,	loss: 73.342
i: 655,	target: -0.727,	output: -9.227,	loss: 72.260
i: 656,	target: -1.015,	output: -9.227,	loss: 67.441
i: 657,	target: -1.242,	output: -9.227,	loss: 63.764
i: 658,	target: -1.198,	output: -9.227,	loss: 64.473
i: 659,	target: -0.911,	output: -9.227,	loss: 69.152
i: 660,	target: -1.169,	output: -9.227,	loss: 64.939
i: 661,	target: -1.919,	output: -9.227,	loss: 53.401
i: 662,	target: -1.029,	output: -9.227,	loss: 67.208
i: 663,	target: -0.896,	output: -9.227,	loss: 69.406
i: 664,	target: -1.953,	output: -9.227,	loss: 52.912
i: 665,	target: 9.330,	output: -9.227,	loss: 344.375
i: 666,	target: -1.146,	output: -9.227,	loss: 65.297
i: 667,	target: -1.545,	output: -9.227,	loss: 59.016
i: 668,	target: -0.550,	output: -9.227,	loss: 75.293
i: 669,	target: 0.415,	output: -9.227,	loss: 92.978
i: 670,	target: -0.168,	output: -9.227,	loss: 82.070
i: 671,	target: -0.807,	output: -9.227,	loss: 70.906
i: 672,	target: -0.645,	output: -9.227,	loss: 73.648
i: 673,	target: -1.502,	output: -9.227,	loss: 59.677
i: 674,	target: -0.809,	output: -9.227,	loss: 70.859
i: 675,	target: -0.988,	output: -9.227,	loss: 67.888
i: 676,	target: -1.741,	output: -9.227,	loss: 56.042
i: 677,	target: 0.157,	output: -9.227,	loss: 88.053
i: 678,	target: -1.363,	output: -9.227,	loss: 61.841
i: 679,	target: -0.642,	output: -9.227,	loss: 73.712
i: 680,	target: -0.467,	output: -9.227,	loss: 76.733
i: 681,	target: -0.865,	output: -9.227,	loss: 69.925
i: 682,	target: -0.622,	output: -9.227,	loss: 74.041
i: 683,	target: -0.859,	output: -9.227,	loss: 70.030
i: 684,	target: -1.477,	output: -9.227,	loss: 60.063

i: 685,	target: -1.219,	output: -9.227,	loss: 64.135
i: 686,	target: -1.048,	output: -9.227,	loss: 66.903
i: 687,	target: -0.072,	output: -9.227,	loss: 83.813
i: 688,	target: -1.409,	output: -9.227,	loss: 61.126
i: 689,	target: 9.624,	output: -9.227,	loss: 355.374
i: 690,	target: -1.227,	output: -9.227,	loss: 63.994
i: 691,	target: 9.480,	output: -9.227,	loss: 349.956
i: 692,	target: -0.508,	output: -9.227,	loss: 76.016
i: 693,	target: 8.936,	output: -9.227,	loss: 329.897
i: 694,	target: -0.288,	output: -9.227,	loss: 79.907
i: 695,	target: -1.041,	output: -9.227,	loss: 67.006
i: 696,	target: -1.480,	output: -9.227,	loss: 60.025
i: 697,	target: -0.428,	output: -9.227,	loss: 77.429
i: 698,	target: -1.063,	output: -9.227,	loss: 66.649
i: 699,	target: -1.160,	output: -9.227,	loss: 65.078
i: 700,	target: -2.139,	output: -9.227,	loss: 50.246
i: 701,	target: -0.435,	output: -9.227,	loss: 77.301
i: 702,	target: -0.678,	output: -9.227,	loss: 73.095
i: 703,	target: -1.600,	output: -9.227,	loss: 58.180
i: 704,	target: -0.625,	output: -9.227,	loss: 74.003
i: 705,	target: -0.794,	output: -9.227,	loss: 71.124
i: 706,	target: -0.761,	output: -9.227,	loss: 71.673
i: 707,	target: -0.679,	output: -9.227,	loss: 73.078
i: 708,	target: -0.661,	output: -9.227,	loss: 73.373
i: 709,	target: -1.004,	output: -9.227,	loss: 67.613
i: 710,	target: -0.331,	output: -9.227,	loss: 79.147
i: 711,	target: -0.662,	output: -9.227,	loss: 73.362
i: 712,	target: -1.087,	output: -9.227,	loss: 66.258
i: 713,	target: -0.505,	output: -9.227,	loss: 76.067
i: 714,	target: -0.372,	output: -9.227,	loss: 78.404
i: 715,	target: -0.268,	output: -9.227,	loss: 80.264
i: 716,	target: 0.101,	output: -9.227,	loss: 87.016
i: 717,	target: -0.944,	output: -9.227,	loss: 68.611
i: 718,	target: -0.943,	output: -9.227,	loss: 68.632
i: 719,	target: -0.458,	output: -9.227,	loss: 76.899
i: 720,	target: -2.068,	output: -9.227,	loss: 51.259
i: 721,	target: -1.215,	output: -9.227,	loss: 64.191
i: 722,	target: -1.779,	output: -9.227,	loss: 55.476
i: 723,	target: -0.612,	output: -9.227,	loss: 74.215
i: 724,	target: 9.225,	output: -9.227,	loss: 340.480
i: 725,	target: -0.667,	output: -9.227,	loss: 73.275
i: 726,	target: -2.015,	output: -9.227,	loss: 52.019
i: 727,	target: -0.912,	output: -9.227,	loss: 69.140
i: 728,	target: -1.222,	output: -9.227,	loss: 64.086
i: 729,	target: -1.749,	output: -9.227,	loss: 55.917
i: 730,	target: -0.667,	output: -9.227,	loss: 73.276
i: 731,	target: -1.277,	output: -9.227,	loss: 63.210
i: 732,	target: -0.047,	output: -9.227,	loss: 84.273

i: 733,	target: -2.081,	output: -9.227,	loss: 51.074
i: 734,	target: -0.946,	output: -9.227,	loss: 68.576
i: 735,	target: -0.557,	output: -9.227,	loss: 75.172
i: 736,	target: -2.596,	output: -9.227,	loss: 43.977
i: 737,	target: -0.444,	output: -9.227,	loss: 77.143
i: 738,	target: -0.423,	output: -9.227,	loss: 77.518
i: 739,	target: -1.373,	output: -9.227,	loss: 61.684
i: 740,	target: -0.775,	output: -9.227,	loss: 71.447
i: 741,	target: -0.961,	output: -9.227,	loss: 68.334
i: 742,	target: -0.598,	output: -9.227,	loss: 74.458
i: 743,	target: -0.901,	output: -9.227,	loss: 69.331
i: 744,	target: -1.280,	output: -9.227,	loss: 63.164
i: 745,	target: -0.647,	output: -9.227,	loss: 73.627
i: 746,	target: -0.617,	output: -9.227,	loss: 74.135
i: 747,	target: -1.460,	output: -9.227,	loss: 60.326
i: 748,	target: -0.439,	output: -9.227,	loss: 77.233
i: 749,	target: -1.103,	output: -9.227,	loss: 66.002
i: 750,	target: -2.080,	output: -9.227,	loss: 51.085
i: 751,	target: -0.512,	output: -9.227,	loss: 75.954
i: 752,	target: -0.546,	output: -9.227,	loss: 75.361
i: 753,	target: -1.180,	output: -9.227,	loss: 64.761
i: 754,	target: -0.836,	output: -9.227,	loss: 70.413
i: 755,	target: 0.232,	output: -9.227,	loss: 89.473
i: 756,	target: 0.088,	output: -9.227,	loss: 86.764
i: 757,	target: -1.488,	output: -9.227,	loss: 59.900
i: 758,	target: -0.749,	output: -9.227,	loss: 71.887
i: 759,	target: -1.251,	output: -9.227,	loss: 63.618
i: 760,	target: -0.192,	output: -9.227,	loss: 81.630
i: 761,	target: -0.578,	output: -9.227,	loss: 74.803
i: 762,	target: -2.377,	output: -9.227,	loss: 46.930
i: 763,	target: -1.518,	output: -9.227,	loss: 59.429
i: 764,	target: -1.956,	output: -9.227,	loss: 52.866
i: 765,	target: -0.659,	output: -9.227,	loss: 73.416
i: 766,	target: -1.301,	output: -9.227,	loss: 62.828
i: 767,	target: -0.528,	output: -9.227,	loss: 75.672
i: 768,	target: -1.187,	output: -9.227,	loss: 64.642
i: 769,	target: -0.755,	output: -9.227,	loss: 71.771
i: 770,	target: -0.620,	output: -9.227,	loss: 74.078
i: 771,	target: -0.453,	output: -9.227,	loss: 76.982
i: 772,	target: -1.133,	output: -9.227,	loss: 65.511
i: 773,	target: -2.131,	output: -9.227,	loss: 50.354
i: 774,	target: -0.757,	output: -9.227,	loss: 71.739
i: 775,	target: -0.122,	output: -9.227,	loss: 82.903
i: 776,	target: -0.760,	output: -9.227,	loss: 71.693
i: 777,	target: 0.549,	output: -9.227,	loss: 95.580
i: 778,	target: -1.467,	output: -9.227,	loss: 60.224
i: 779,	target: -0.361,	output: -9.227,	loss: 78.615
i: 780,	target: -1.440,	output: -9.227,	loss: 60.644

i: 781,	target: -1.660,	output: -9.227,	loss: 57.257
i: 782,	target: -1.939,	output: -9.227,	loss: 53.119
i: 783,	target: -0.887,	output: -9.227,	loss: 69.560
i: 784,	target: -1.321,	output: -9.227,	loss: 62.504
i: 785,	target: -1.240,	output: -9.227,	loss: 63.789
i: 786,	target: -1.555,	output: -9.227,	loss: 58.865
i: 787,	target: -1.193,	output: -9.227,	loss: 64.552
i: 788,	target: -0.962,	output: -9.227,	loss: 68.312
i: 789,	target: -1.684,	output: -9.227,	loss: 56.897
i: 790,	target: -1.125,	output: -9.227,	loss: 65.644
i: 791,	target: 9.521,	output: -9.227,	loss: 351.510
i: 792,	target: -2.396,	output: -9.227,	loss: 46.658
i: 793,	target: -1.314,	output: -9.227,	loss: 62.617
i: 794,	target: -0.431,	output: -9.227,	loss: 77.367
i: 795,	target: -0.580,	output: -9.227,	loss: 74.774
i: 796,	target: -0.825,	output: -9.227,	loss: 70.600
i: 797,	target: 8.854,	output: -9.227,	loss: 326.909
i: 798,	target: -1.346,	output: -9.227,	loss: 62.120
i: 799,	target: -1.472,	output: -9.227,	loss: 60.139
i: 800,	target: -0.757,	output: -9.227,	loss: 71.749
i: 801,	target: -0.124,	output: -9.227,	loss: 82.874
i: 802,	target: -0.700,	output: -9.227,	loss: 72.711
i: 803,	target: 0.152,	output: -9.227,	loss: 87.969
i: 804,	target: -0.897,	output: -9.227,	loss: 69.397
i: 805,	target: -0.809,	output: -9.227,	loss: 70.866
i: 806,	target: -1.234,	output: -9.227,	loss: 63.884
i: 807,	target: -0.592,	output: -9.227,	loss: 74.559
i: 808,	target: -0.633,	output: -9.227,	loss: 73.859
i: 809,	target: -1.317,	output: -9.227,	loss: 62.576
i: 810,	target: -0.470,	output: -9.227,	loss: 76.684
i: 811,	target: -1.634,	output: -9.227,	loss: 57.648
i: 812,	target: -2.108,	output: -9.227,	loss: 50.688
i: 813,	target: -0.405,	output: -9.227,	loss: 77.824
i: 814,	target: -0.540,	output: -9.227,	loss: 75.468
i: 815,	target: -0.790,	output: -9.227,	loss: 71.193
i: 816,	target: -0.656,	output: -9.227,	loss: 73.472
i: 817,	target: -0.895,	output: -9.227,	loss: 69.420
i: 818,	target: -2.261,	output: -9.227,	loss: 48.527
i: 819,	target: -0.314,	output: -9.227,	loss: 79.438
i: 820,	target: -0.874,	output: -9.227,	loss: 69.772
i: 821,	target: -0.815,	output: -9.227,	loss: 70.763
i: 822,	target: -0.674,	output: -9.227,	loss: 73.154
i: 823,	target: -1.154,	output: -9.227,	loss: 65.178
i: 824,	target: -2.064,	output: -9.227,	loss: 51.313
i: 825,	target: -1.466,	output: -9.227,	loss: 60.239
i: 826,	target: -1.335,	output: -9.227,	loss: 62.278
i: 827,	target: -0.781,	output: -9.227,	loss: 71.336
i: 828,	target: -0.764,	output: -9.227,	loss: 71.632

i: 829,	target: -1.223,	output: -9.227,	loss: 64.063
i: 830,	target: -0.966,	output: -9.227,	loss: 68.244
i: 831,	target: -2.181,	output: -9.227,	loss: 49.644
i: 832,	target: -1.282,	output: -9.227,	loss: 63.128
i: 833,	target: 8.869,	output: -9.227,	loss: 327.472
i: 834,	target: -0.991,	output: -9.227,	loss: 67.841
i: 835,	target: 0.365,	output: -9.227,	loss: 92.003
i: 836,	target: 0.415,	output: -9.227,	loss: 92.975
i: 837,	target: -0.271,	output: -9.227,	loss: 80.220
i: 838,	target: -0.765,	output: -9.227,	loss: 71.607
i: 839,	target: -2.642,	output: -9.227,	loss: 43.364
i: 840,	target: -1.174,	output: -9.227,	loss: 64.860
i: 841,	target: -0.855,	output: -9.227,	loss: 70.098
i: 842,	target: -2.039,	output: -9.227,	loss: 51.668
i: 843,	target: -0.971,	output: -9.227,	loss: 68.166
i: 844,	target: -0.214,	output: -9.227,	loss: 81.242
i: 845,	target: -0.449,	output: -9.227,	loss: 77.047
i: 846,	target: -1.439,	output: -9.227,	loss: 60.653
i: 847,	target: -1.418,	output: -9.227,	loss: 60.988
i: 848,	target: -1.136,	output: -9.227,	loss: 65.474
i: 849,	target: -0.591,	output: -9.227,	loss: 74.577
i: 850,	target: -0.660,	output: -9.227,	loss: 73.398
i: 851,	target: -0.129,	output: -9.227,	loss: 82.769
i: 852,	target: -0.770,	output: -9.227,	loss: 71.521
i: 853,	target: 0.289,	output: -9.227,	loss: 90.556
i: 854,	target: -1.560,	output: -9.227,	loss: 58.788
i: 855,	target: -0.599,	output: -9.227,	loss: 74.445
i: 856,	target: -1.323,	output: -9.227,	loss: 62.482
i: 857,	target: -0.605,	output: -9.227,	loss: 74.339
i: 858,	target: -0.548,	output: -9.227,	loss: 75.330
i: 859,	target: -0.523,	output: -9.227,	loss: 75.765
i: 860,	target: -0.770,	output: -9.227,	loss: 71.530
i: 861,	target: -0.517,	output: -9.227,	loss: 75.859
i: 862,	target: -0.526,	output: -9.227,	loss: 75.715
i: 863,	target: -0.754,	output: -9.227,	loss: 71.791
i: 864,	target: -0.733,	output: -9.227,	loss: 72.155
i: 865,	target: -1.595,	output: -9.227,	loss: 58.256
i: 866,	target: -1.931,	output: -9.227,	loss: 53.226
i: 867,	target: -0.933,	output: -9.227,	loss: 68.799
i: 868,	target: -0.536,	output: -9.227,	loss: 75.543
i: 869,	target: -1.868,	output: -9.227,	loss: 54.163
i: 870,	target: -0.908,	output: -9.227,	loss: 69.204
i: 871,	target: -1.359,	output: -9.227,	loss: 61.905
i: 872,	target: -0.147,	output: -9.227,	loss: 82.447
i: 873,	target: -0.719,	output: -9.227,	loss: 72.384
i: 874,	target: -0.604,	output: -9.227,	loss: 74.352
i: 875,	target: -1.185,	output: -9.227,	loss: 64.675
i: 876,	target: -0.389,	output: -9.227,	loss: 78.111

i: 877,	target: -0.237,	output: -9.227,	loss: 80.819
i: 878,	target: -0.621,	output: -9.227,	loss: 74.068
i: 879,	target: -1.784,	output: -9.227,	loss: 55.394
i: 880,	target: -0.362,	output: -9.227,	loss: 78.595
i: 881,	target: -0.763,	output: -9.227,	loss: 71.642
i: 882,	target: -1.987,	output: -9.227,	loss: 52.414
i: 883,	target: -2.507,	output: -9.227,	loss: 45.165
i: 884,	target: -0.795,	output: -9.227,	loss: 71.105
i: 885,	target: -0.652,	output: -9.227,	loss: 73.539
i: 886,	target: 0.371,	output: -9.227,	loss: 92.132
i: 887,	target: -0.470,	output: -9.227,	loss: 76.684
i: 888,	target: -1.635,	output: -9.227,	loss: 57.638
i: 889,	target: -0.555,	output: -9.227,	loss: 75.207
i: 890,	target: -1.457,	output: -9.227,	loss: 60.373
i: 891,	target: 9.705,	output: -9.227,	loss: 358.411
i: 892,	target: -0.371,	output: -9.227,	loss: 78.425
i: 893,	target: -0.964,	output: -9.227,	loss: 68.283
i: 894,	target: -1.493,	output: -9.227,	loss: 59.820
i: 895,	target: -1.786,	output: -9.227,	loss: 55.372
i: 896,	target: 9.028,	output: -9.227,	loss: 333.265
i: 897,	target: -1.202,	output: -9.227,	loss: 64.404
i: 898,	target: -0.875,	output: -9.227,	loss: 69.760
i: 899,	target: -1.315,	output: -9.227,	loss: 62.599
i: 900,	target: -1.167,	output: -9.227,	loss: 64.972
i: 901,	target: 0.720,	output: -9.227,	loss: 98.953
i: 902,	target: -0.652,	output: -9.227,	loss: 73.528
i: 903,	target: -0.967,	output: -9.227,	loss: 68.234
i: 904,	target: -1.024,	output: -9.227,	loss: 67.297
i: 905,	target: -1.981,	output: -9.227,	loss: 52.509
i: 906,	target: -1.517,	output: -9.227,	loss: 59.440
i: 907,	target: -1.314,	output: -9.227,	loss: 62.612
i: 908,	target: -1.411,	output: -9.227,	loss: 61.088
i: 909,	target: -0.486,	output: -9.227,	loss: 76.403
i: 910,	target: -0.755,	output: -9.227,	loss: 71.772
i: 911,	target: -1.932,	output: -9.227,	loss: 53.217
i: 912,	target: 0.636,	output: -9.227,	loss: 97.275
i: 913,	target: -0.992,	output: -9.227,	loss: 67.812
i: 914,	target: -0.334,	output: -9.227,	loss: 79.079
i: 915,	target: 0.602,	output: -9.227,	loss: 96.607
i: 916,	target: -1.424,	output: -9.227,	loss: 60.885
i: 917,	target: -1.417,	output: -9.227,	loss: 60.995
i: 918,	target: -1.583,	output: -9.227,	loss: 58.439
i: 919,	target: -0.907,	output: -9.227,	loss: 69.226
i: 920,	target: -0.897,	output: -9.227,	loss: 69.393
i: 921,	target: -0.646,	output: -9.227,	loss: 73.637
i: 922,	target: -1.373,	output: -9.227,	loss: 61.690
i: 923,	target: -0.801,	output: -9.227,	loss: 71.006
i: 924,	target: -1.613,	output: -9.227,	loss: 57.979

i: 925,	target: 0.271,	output: -9.227,	loss: 90.205
i: 926,	target: 0.027,	output: -9.227,	loss: 85.640
i: 927,	target: -0.716,	output: -9.227,	loss: 72.431
i: 928,	target: -1.894,	output: -9.227,	loss: 53.771
i: 929,	target: -0.659,	output: -9.227,	loss: 73.415
i: 930,	target: -1.903,	output: -9.227,	loss: 53.640
i: 931,	target: -1.190,	output: -9.227,	loss: 64.599
i: 932,	target: -1.638,	output: -9.227,	loss: 57.599
i: 933,	target: -0.869,	output: -9.227,	loss: 69.863
i: 934,	target: -0.948,	output: -9.227,	loss: 68.547
i: 935,	target: -0.721,	output: -9.227,	loss: 72.361
i: 936,	target: -1.412,	output: -9.227,	loss: 61.069
i: 937,	target: -0.575,	output: -9.227,	loss: 74.855
i: 938,	target: -0.989,	output: -9.227,	loss: 67.872
i: 939,	target: -0.744,	output: -9.227,	loss: 71.956
i: 940,	target: -1.613,	output: -9.227,	loss: 57.978
i: 941,	target: -1.174,	output: -9.227,	loss: 64.854
i: 942,	target: -0.682,	output: -9.227,	loss: 73.023
i: 943,	target: -0.552,	output: -9.227,	loss: 75.256
i: 944,	target: -1.870,	output: -9.227,	loss: 54.123
i: 945,	target: -1.599,	output: -9.227,	loss: 58.193
i: 946,	target: -0.880,	output: -9.227,	loss: 69.674
i: 947,	target: -0.643,	output: -9.227,	loss: 73.689
i: 948,	target: -1.195,	output: -9.227,	loss: 64.509
i: 949,	target: -0.797,	output: -9.227,	loss: 71.060
i: 950,	target: -0.267,	output: -9.227,	loss: 80.282
i: 951,	target: 9.253,	output: -9.227,	loss: 341.509
i: 952,	target: -1.427,	output: -9.227,	loss: 60.839
i: 953,	target: -1.626,	output: -9.227,	loss: 57.777
i: 954,	target: -1.310,	output: -9.227,	loss: 62.686
i: 955,	target: -0.977,	output: -9.227,	loss: 68.070
i: 956,	target: -0.325,	output: -9.227,	loss: 79.250
i: 957,	target: -0.757,	output: -9.227,	loss: 71.735
i: 958,	target: -0.419,	output: -9.227,	loss: 77.585
i: 959,	target: -0.640,	output: -9.227,	loss: 73.743
i: 960,	target: -0.792,	output: -9.227,	loss: 71.152
i: 961,	target: -1.508,	output: -9.227,	loss: 59.577
i: 962,	target: 9.608,	output: -9.227,	loss: 354.771
i: 963,	target: -0.849,	output: -9.227,	loss: 70.199
i: 964,	target: -0.902,	output: -9.227,	loss: 69.309
i: 965,	target: -0.940,	output: -9.227,	loss: 68.673
i: 966,	target: -1.709,	output: -9.227,	loss: 56.528
i: 967,	target: -0.235,	output: -9.227,	loss: 80.850
i: 968,	target: -0.957,	output: -9.227,	loss: 68.395
i: 969,	target: -0.471,	output: -9.227,	loss: 76.674
i: 970,	target: -1.113,	output: -9.227,	loss: 65.843
i: 971,	target: -1.487,	output: -9.227,	loss: 59.910
i: 972,	target: -0.456,	output: -9.227,	loss: 76.936

i: 973,	target: 0.288,	output: -9.227,	loss: 90.540
i: 974,	target: 9.599,	output: -9.227,	loss: 354.426
i: 975,	target: -1.833,	output: -9.227,	loss: 54.674
i: 976,	target: -1.895,	output: -9.227,	loss: 53.763
i: 977,	target: -0.402,	output: -9.227,	loss: 77.888
i: 978,	target: -1.194,	output: -9.227,	loss: 64.533
i: 979,	target: -1.975,	output: -9.227,	loss: 52.599
i: 980,	target: -1.149,	output: -9.227,	loss: 65.251
i: 981,	target: -0.532,	output: -9.227,	loss: 75.604
i: 982,	target: -1.631,	output: -9.227,	loss: 57.700
i: 983,	target: -2.816,	output: -9.227,	loss: 41.107
i: 984,	target: -1.893,	output: -9.227,	loss: 53.788
i: 985,	target: -0.955,	output: -9.227,	loss: 68.422
i: 986,	target: 8.536,	output: -9.227,	loss: 315.521
i: 987,	target: -0.812,	output: -9.227,	loss: 70.808
i: 988,	target: -0.472,	output: -9.227,	loss: 76.644
i: 989,	target: -0.700,	output: -9.227,	loss: 72.705
i: 990,	target: -1.350,	output: -9.227,	loss: 62.047
i: 991,	target: -0.596,	output: -9.227,	loss: 74.496
i: 992,	target: -0.988,	output: -9.227,	loss: 67.880
i: 993,	target: -0.960,	output: -9.227,	loss: 68.351
i: 994,	target: -0.884,	output: -9.227,	loss: 69.615
i: 995,	target: -1.456,	output: -9.227,	loss: 60.387
i: 996,	target: -0.261,	output: -9.227,	loss: 80.391
i: 997,	target: -1.407,	output: -9.227,	loss: 61.147
i: 998,	target: -0.638,	output: -9.227,	loss: 73.766
i: 999,	target: -1.302,	output: -9.227,	loss: 62.801

Average loss: 80.807

4 Save the Notebook as a PDF

```
[21]: # SAVE THE NOTEBOOK

from IPython.display import Javascript

# Define the function to save the notebook
def save_notebook():
    display(Javascript('IPython.notebook.save_notebook()'))

# Call the save_notebook function to save the notebook
save_notebook()
```

<IPython.core.display.Javascript object>

```
[22]: import subprocess
import os
```

```

name_notebook = "0725-small_hybrid_model_1q_measurement.ipynb"

output_filename = "results/" + name_notebook[:4] + "/" + name_notebook[:-6] + "_0.
↳pdf"

#check if the output file already exists
while os.path.exists(output_filename):
    print("The file {} already exists".format(output_filename))
    output_filename = output_filename[:-5] + str(int(output_filename[-5]) + 1)
    ↳+ ".pdf"
    print("Trying to save the file as {}".format(output_filename))

subprocess.run(["jupyter", "nbconvert", "--to", "pdf", "--output",
↳output_filename, name_notebook])

```

The file results/0725/0725-small_hybrid_model_1q_measurement_0.pdf already exists

Trying to save the file as

results/0725/0725-small_hybrid_model_1q_measurement_1.pdf

[22]: CompletedProcess(args=['jupyter', 'nbconvert', '--to', 'pdf', '--output', 'results/0725/0725-small_hybrid_model_1q_measurement_1.pdf', '0725-small_hybrid_model_1q_measurement.ipynb'], returncode=0)