

# 0724-small\_classical\_model

July 24, 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 Classical model

```
[7]: 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 += [nn.Linear(input_dim*1, input_dim*1), nn.ReLU()] * 2
layers += [nn.Linear(input_dim*1, 1)]
Net = nn.Sequential(*layers)
```

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

```
[9]: import time
```

```
[10]: # 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

# Training loop
num_epochs = 100
batch_size = 32

losses = []
losses_epochs = []
losses_epochs_validation = []

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()))

# add to the epoch loss
losses_epochs[-1] += loss.item() / (input_data.size(0) / batch_size)

# Compute the validation loss
outputs_validation = model(input_validation)
loss_validation = criterion(outputs_validation, target_validation)
losses_epochs_validation.append(loss_validation.item())

# Print the loss for this epoch
print('Epoch [{}/{}], Loss: {:.4f}'.format(epoch+1, num_epochs,
↪ losses_epochs[-1]))

# 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 [1/100], Loss: 5.3726  
Epoch [1/100], Loss: 5.3726, Time remaining: ~0.0h 2.0m 32s  
Epoch [2/100], Loss: 4.3608  
Epoch [2/100], Loss: 4.3608, Time remaining: ~0.0h 2.0m 29s  
Epoch [3/100], Loss: 3.1808  
Epoch [3/100], Loss: 3.1808, Time remaining: ~0.0h 2.0m 25s  
Epoch [4/100], Loss: 0.7673  
Epoch [4/100], Loss: 0.7673, Time remaining: ~0.0h 2.0m 25s  
Epoch [5/100], Loss: 0.4372  
Epoch [5/100], Loss: 0.4372, Time remaining: ~0.0h 2.0m 20s  
Epoch [6/100], Loss: 0.3566  
Epoch [6/100], Loss: 0.3566, Time remaining: ~0.0h 2.0m 18s  
Epoch [7/100], Loss: 0.3402  
Epoch [7/100], Loss: 0.3402, Time remaining: ~0.0h 2.0m 18s  
Epoch [8/100], Loss: 0.3152  
Epoch [8/100], Loss: 0.3152, Time remaining: ~0.0h 2.0m 15s  
Epoch [9/100], Loss: 0.3133  
Epoch [9/100], Loss: 0.3133, Time remaining: ~0.0h 2.0m 13s  
Epoch [10/100], Loss: 0.2991  
Epoch [10/100], Loss: 0.2991, Time remaining: ~0.0h 2.0m 12s  
Epoch [11/100], Loss: 0.2934  
Epoch [11/100], Loss: 0.2934, Time remaining: ~0.0h 2.0m 9s  
Epoch [12/100], Loss: 0.2869  
Epoch [12/100], Loss: 0.2869, Time remaining: ~0.0h 2.0m 7s  
Epoch [13/100], Loss: 0.2903  
Epoch [13/100], Loss: 0.2903, Time remaining: ~0.0h 2.0m 7s  
Epoch [14/100], Loss: 0.2916  
Epoch [14/100], Loss: 0.2916, Time remaining: ~0.0h 2.0m 5s  
Epoch [15/100], Loss: 0.2874  
Epoch [15/100], Loss: 0.2874, Time remaining: ~0.0h 2.0m 4s  
Epoch [16/100], Loss: 0.2742  
Epoch [16/100], Loss: 0.2742, Time remaining: ~0.0h 2.0m 3s  
Epoch [17/100], Loss: 0.2762  
Epoch [17/100], Loss: 0.2762, Time remaining: ~0.0h 2.0m 2s  
Epoch [18/100], Loss: 0.2722  
Epoch [18/100], Loss: 0.2722, Time remaining: ~0.0h 2.0m 1s  
Epoch [19/100], Loss: 0.2722  
Epoch [19/100], Loss: 0.2722, Time remaining: ~0.0h 1.0m 60s  
Epoch [20/100], Loss: 0.2703  
Epoch [20/100], Loss: 0.2703, Time remaining: ~0.0h 1.0m 58s  
Epoch [21/100], Loss: 0.2682  
Epoch [21/100], Loss: 0.2682, Time remaining: ~0.0h 1.0m 56s  
Epoch [22/100], Loss: 0.2670  
Epoch [22/100], Loss: 0.2670, Time remaining: ~0.0h 1.0m 54s  
Epoch [23/100], Loss: 0.2660  
Epoch [23/100], Loss: 0.2660, Time remaining: ~0.0h 1.0m 53s  
Epoch [24/100], Loss: 0.2603  
Epoch [24/100], Loss: 0.2603, Time remaining: ~0.0h 1.0m 51s

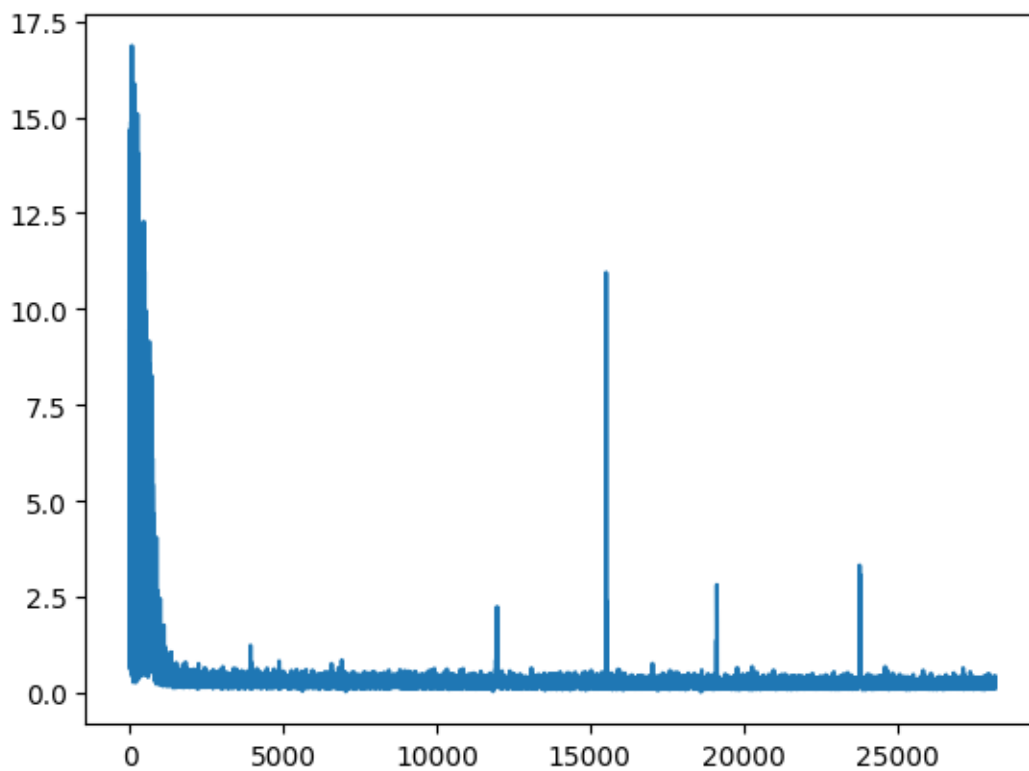
Epoch [25/100], Loss: 0.2769  
Epoch [25/100], Loss: 0.2769, Time remaining: ~0.0h 1.0m 50s  
Epoch [26/100], Loss: 0.2568  
Epoch [26/100], Loss: 0.2568, Time remaining: ~0.0h 1.0m 48s  
Epoch [27/100], Loss: 0.2547  
Epoch [27/100], Loss: 0.2547, Time remaining: ~0.0h 1.0m 47s  
Epoch [28/100], Loss: 0.2557  
Epoch [28/100], Loss: 0.2557, Time remaining: ~0.0h 1.0m 45s  
Epoch [29/100], Loss: 0.2576  
Epoch [29/100], Loss: 0.2576, Time remaining: ~0.0h 1.0m 44s  
Epoch [30/100], Loss: 0.2509  
Epoch [30/100], Loss: 0.2509, Time remaining: ~0.0h 1.0m 42s  
Epoch [31/100], Loss: 0.2476  
Epoch [31/100], Loss: 0.2476, Time remaining: ~0.0h 1.0m 41s  
Epoch [32/100], Loss: 0.2484  
Epoch [32/100], Loss: 0.2484, Time remaining: ~0.0h 1.0m 39s  
Epoch [33/100], Loss: 0.2487  
Epoch [33/100], Loss: 0.2487, Time remaining: ~0.0h 1.0m 38s  
Epoch [34/100], Loss: 0.2432  
Epoch [34/100], Loss: 0.2432, Time remaining: ~0.0h 1.0m 37s  
Epoch [35/100], Loss: 0.2464  
Epoch [35/100], Loss: 0.2464, Time remaining: ~0.0h 1.0m 35s  
Epoch [36/100], Loss: 0.2448  
Epoch [36/100], Loss: 0.2448, Time remaining: ~0.0h 1.0m 34s  
Epoch [37/100], Loss: 0.2438  
Epoch [37/100], Loss: 0.2438, Time remaining: ~0.0h 1.0m 32s  
Epoch [38/100], Loss: 0.2445  
Epoch [38/100], Loss: 0.2445, Time remaining: ~0.0h 1.0m 31s  
Epoch [39/100], Loss: 0.2527  
Epoch [39/100], Loss: 0.2527, Time remaining: ~0.0h 1.0m 29s  
Epoch [40/100], Loss: 0.2424  
Epoch [40/100], Loss: 0.2424, Time remaining: ~0.0h 1.0m 27s  
Epoch [41/100], Loss: 0.2383  
Epoch [41/100], Loss: 0.2383, Time remaining: ~0.0h 1.0m 25s  
Epoch [42/100], Loss: 0.2388  
Epoch [42/100], Loss: 0.2388, Time remaining: ~0.0h 1.0m 24s  
Epoch [43/100], Loss: 0.3045  
Epoch [43/100], Loss: 0.3045, Time remaining: ~0.0h 1.0m 22s  
Epoch [44/100], Loss: 0.2427  
Epoch [44/100], Loss: 0.2427, Time remaining: ~0.0h 1.0m 21s  
Epoch [45/100], Loss: 0.2404  
Epoch [45/100], Loss: 0.2404, Time remaining: ~0.0h 1.0m 19s  
Epoch [46/100], Loss: 0.2392  
Epoch [46/100], Loss: 0.2392, Time remaining: ~0.0h 1.0m 18s  
Epoch [47/100], Loss: 0.2386  
Epoch [47/100], Loss: 0.2386, Time remaining: ~0.0h 1.0m 16s  
Epoch [48/100], Loss: 0.2372  
Epoch [48/100], Loss: 0.2372, Time remaining: ~0.0h 1.0m 15s

Epoch [49/100], Loss: 0.2376  
Epoch [49/100], Loss: 0.2376, Time remaining: ~0.0h 1.0m 13s  
Epoch [50/100], Loss: 0.2381  
Epoch [50/100], Loss: 0.2381, Time remaining: ~0.0h 1.0m 12s  
Epoch [51/100], Loss: 0.2374  
Epoch [51/100], Loss: 0.2374, Time remaining: ~0.0h 1.0m 10s  
Epoch [52/100], Loss: 0.2361  
Epoch [52/100], Loss: 0.2361, Time remaining: ~0.0h 1.0m 9s  
Epoch [53/100], Loss: 0.2344  
Epoch [53/100], Loss: 0.2344, Time remaining: ~0.0h 1.0m 7s  
Epoch [54/100], Loss: 0.2338  
Epoch [54/100], Loss: 0.2338, Time remaining: ~0.0h 1.0m 6s  
Epoch [55/100], Loss: 0.2345  
Epoch [55/100], Loss: 0.2345, Time remaining: ~0.0h 1.0m 5s  
Epoch [56/100], Loss: 0.3044  
Epoch [56/100], Loss: 0.3044, Time remaining: ~0.0h 1.0m 3s  
Epoch [57/100], Loss: 0.2340  
Epoch [57/100], Loss: 0.2340, Time remaining: ~0.0h 1.0m 2s  
Epoch [58/100], Loss: 0.2303  
Epoch [58/100], Loss: 0.2303, Time remaining: ~0.0h 1.0m 1s  
Epoch [59/100], Loss: 0.2293  
Epoch [59/100], Loss: 0.2293, Time remaining: ~0.0h 0.0m 59s  
Epoch [60/100], Loss: 0.2289  
Epoch [60/100], Loss: 0.2289, Time remaining: ~0.0h 0.0m 58s  
Epoch [61/100], Loss: 0.2289  
Epoch [61/100], Loss: 0.2289, Time remaining: ~0.0h 0.0m 57s  
Epoch [62/100], Loss: 0.2288  
Epoch [62/100], Loss: 0.2288, Time remaining: ~0.0h 0.0m 55s  
Epoch [63/100], Loss: 0.2300  
Epoch [63/100], Loss: 0.2300, Time remaining: ~0.0h 0.0m 54s  
Epoch [64/100], Loss: 0.2270  
Epoch [64/100], Loss: 0.2270, Time remaining: ~0.0h 0.0m 52s  
Epoch [65/100], Loss: 0.2286  
Epoch [65/100], Loss: 0.2286, Time remaining: ~0.0h 0.0m 51s  
Epoch [66/100], Loss: 0.2258  
Epoch [66/100], Loss: 0.2258, Time remaining: ~0.0h 0.0m 49s  
Epoch [67/100], Loss: 0.2269  
Epoch [67/100], Loss: 0.2269, Time remaining: ~0.0h 0.0m 48s  
Epoch [68/100], Loss: 0.2600  
Epoch [68/100], Loss: 0.2600, Time remaining: ~0.0h 0.0m 46s  
Epoch [69/100], Loss: 0.2255  
Epoch [69/100], Loss: 0.2255, Time remaining: ~0.0h 0.0m 45s  
Epoch [70/100], Loss: 0.2243  
Epoch [70/100], Loss: 0.2243, Time remaining: ~0.0h 0.0m 43s  
Epoch [71/100], Loss: 0.2265  
Epoch [71/100], Loss: 0.2265, Time remaining: ~0.0h 0.0m 42s  
Epoch [72/100], Loss: 0.2226  
Epoch [72/100], Loss: 0.2226, Time remaining: ~0.0h 0.0m 40s

Epoch [73/100], Loss: 0.2240  
Epoch [73/100], Loss: 0.2240, Time remaining: ~0.0h 0.0m 39s  
Epoch [74/100], Loss: 0.2234  
Epoch [74/100], Loss: 0.2234, Time remaining: ~0.0h 0.0m 38s  
Epoch [75/100], Loss: 0.2226  
Epoch [75/100], Loss: 0.2226, Time remaining: ~0.0h 0.0m 36s  
Epoch [76/100], Loss: 0.2202  
Epoch [76/100], Loss: 0.2202, Time remaining: ~0.0h 0.0m 35s  
Epoch [77/100], Loss: 0.2221  
Epoch [77/100], Loss: 0.2221, Time remaining: ~0.0h 0.0m 33s  
Epoch [78/100], Loss: 0.2222  
Epoch [78/100], Loss: 0.2222, Time remaining: ~0.0h 0.0m 32s  
Epoch [79/100], Loss: 0.2237  
Epoch [79/100], Loss: 0.2237, Time remaining: ~0.0h 0.0m 30s  
Epoch [80/100], Loss: 0.2201  
Epoch [80/100], Loss: 0.2201, Time remaining: ~0.0h 0.0m 29s  
Epoch [81/100], Loss: 0.2191  
Epoch [81/100], Loss: 0.2191, Time remaining: ~0.0h 0.0m 27s  
Epoch [82/100], Loss: 0.2206  
Epoch [82/100], Loss: 0.2206, Time remaining: ~0.0h 0.0m 26s  
Epoch [83/100], Loss: 0.2199  
Epoch [83/100], Loss: 0.2199, Time remaining: ~0.0h 0.0m 25s  
Epoch [84/100], Loss: 0.2187  
Epoch [84/100], Loss: 0.2187, Time remaining: ~0.0h 0.0m 23s  
Epoch [85/100], Loss: 0.2790  
Epoch [85/100], Loss: 0.2790, Time remaining: ~0.0h 0.0m 22s  
Epoch [86/100], Loss: 0.2166  
Epoch [86/100], Loss: 0.2166, Time remaining: ~0.0h 0.0m 20s  
Epoch [87/100], Loss: 0.2161  
Epoch [87/100], Loss: 0.2161, Time remaining: ~0.0h 0.0m 19s  
Epoch [88/100], Loss: 0.2171  
Epoch [88/100], Loss: 0.2171, Time remaining: ~0.0h 0.0m 17s  
Epoch [89/100], Loss: 0.2150  
Epoch [89/100], Loss: 0.2150, Time remaining: ~0.0h 0.0m 16s  
Epoch [90/100], Loss: 0.2167  
Epoch [90/100], Loss: 0.2167, Time remaining: ~0.0h 0.0m 14s  
Epoch [91/100], Loss: 0.2154  
Epoch [91/100], Loss: 0.2154, Time remaining: ~0.0h 0.0m 13s  
Epoch [92/100], Loss: 0.2138  
Epoch [92/100], Loss: 0.2138, Time remaining: ~0.0h 0.0m 12s  
Epoch [93/100], Loss: 0.2149  
Epoch [93/100], Loss: 0.2149, Time remaining: ~0.0h 0.0m 10s  
Epoch [94/100], Loss: 0.2147  
Epoch [94/100], Loss: 0.2147, Time remaining: ~0.0h 0.0m 9s  
Epoch [95/100], Loss: 0.2134  
Epoch [95/100], Loss: 0.2134, Time remaining: ~0.0h 0.0m 7s  
Epoch [96/100], Loss: 0.2138  
Epoch [96/100], Loss: 0.2138, Time remaining: ~0.0h 0.0m 6s

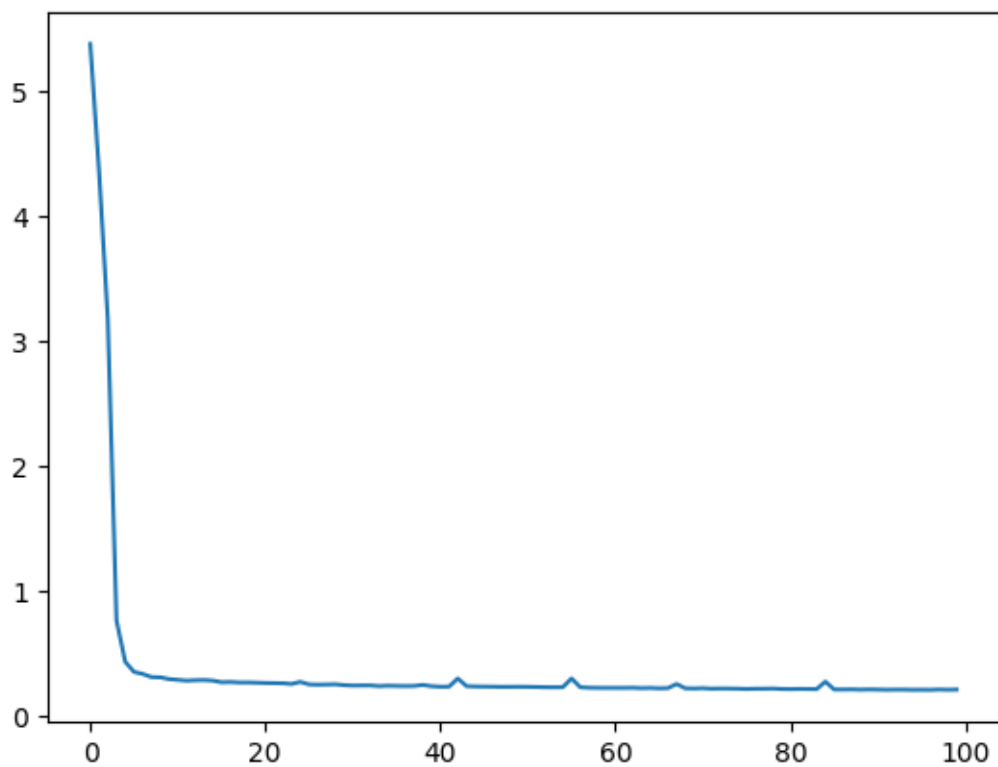
```
Epoch [97/100], Loss: 0.2132
Epoch [97/100], Loss: 0.2132, Time remaining: ~0.0h 0.0m 4s
Epoch [98/100], Loss: 0.2159
Epoch [98/100], Loss: 0.2159, Time remaining: ~0.0h 0.0m 3s
Epoch [99/100], Loss: 0.2138
Epoch [99/100], Loss: 0.2138, Time remaining: ~0.0h 0.0m 1s
Epoch [100/100], Loss: 0.2155
Epoch [100/100], Loss: 0.2155, Time remaining: ~0.0h 0.0m 0s
```

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

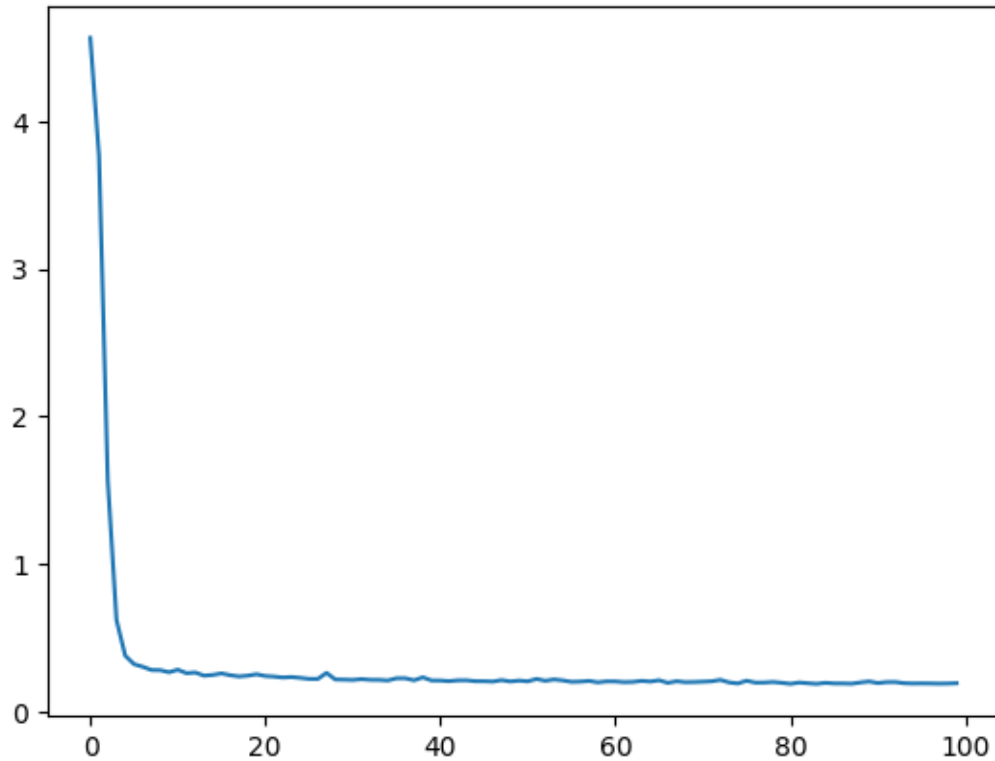


```
[12]: #plot the loss
import matplotlib.pyplot as plt
plt.plot(losses_epochs)
plt.show()
```





```
[13]: import matplotlib.pyplot as plt
plt.plot(losses_epochs_validation)
plt.show()
```



```
[14]: 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: {}, target: {:.3f}, output: {:.3f}, loss: {:.3f}'.format(x, t.
    ↪item(), model(i).item(), loss))
    print('')

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

i: 0, target: -0.939, output: -0.881, loss: 0.003

i: 1, target: -1.465, output: -0.846, loss: 0.383

i: 2, target: -1.138, output: -1.290, loss: 0.023

i: 3, target: -1.132, output: -1.259, loss: 0.016

i: 4, target: -2.701, output: -1.718, loss: 0.965

i: 5, target: 0.858, output: 0.073, loss: 0.617

i: 6, target: -0.559, output: -0.968, loss: 0.167  
i: 7, target: 8.906, output: 9.236, loss: 0.108  
i: 8, target: -0.514, output: -0.711, loss: 0.039  
i: 9, target: -1.426, output: -1.541, loss: 0.013  
i: 10, target: -1.191, output: -0.832, loss: 0.129  
i: 11, target: -0.769, output: -0.835, loss: 0.004  
i: 12, target: -1.226, output: -1.547, loss: 0.103  
i: 13, target: -1.764, output: -1.235, loss: 0.280  
i: 14, target: -0.660, output: -0.771, loss: 0.012  
i: 15, target: -0.859, output: -0.845, loss: 0.000  
i: 16, target: -0.614, output: -0.956, loss: 0.117  
i: 17, target: -1.467, output: -1.041, loss: 0.182  
i: 18, target: -1.111, output: -1.581, loss: 0.221  
i: 19, target: -1.426, output: -1.172, loss: 0.064  
i: 20, target: -1.346, output: -1.238, loss: 0.012  
i: 21, target: -0.939, output: -1.165, loss: 0.051  
i: 22, target: -0.520, output: -1.108, loss: 0.346  
i: 23, target: -1.482, output: -1.506, loss: 0.001  
i: 24, target: -0.567, output: -0.774, loss: 0.043  
i: 25, target: -1.377, output: -1.543, loss: 0.027  
i: 26, target: -0.662, output: -1.094, loss: 0.186  
i: 27, target: -0.656, output: -1.123, loss: 0.218  
i: 28, target: -0.451, output: -0.808, loss: 0.128  
i: 29, target: -0.943, output: -0.909, loss: 0.001

i: 30, target: -0.207, output: -0.872, loss: 0.442  
i: 31, target: -1.017, output: -1.089, loss: 0.005  
i: 32, target: -1.426, output: -0.937, loss: 0.239  
i: 33, target: -0.855, output: -0.713, loss: 0.020  
i: 34, target: -0.737, output: -0.820, loss: 0.007  
i: 35, target: -1.175, output: -1.367, loss: 0.037  
i: 36, target: -0.545, output: -0.959, loss: 0.171  
i: 37, target: -0.398, output: -0.915, loss: 0.268  
i: 38, target: -0.847, output: -0.781, loss: 0.004  
i: 39, target: -0.697, output: -0.937, loss: 0.058  
i: 40, target: 9.469, output: 9.473, loss: 0.000  
i: 41, target: -1.512, output: -1.085, loss: 0.182  
i: 42, target: -0.347, output: -1.078, loss: 0.533  
i: 43, target: -0.078, output: -0.971, loss: 0.797  
i: 44, target: -1.398, output: -0.977, loss: 0.177  
i: 45, target: -1.236, output: -1.089, loss: 0.022  
i: 46, target: -1.428, output: -0.871, loss: 0.311  
i: 47, target: -0.201, output: 0.243, loss: 0.197  
i: 48, target: -1.487, output: -1.562, loss: 0.006  
i: 49, target: -0.503, output: -1.300, loss: 0.634  
i: 50, target: -0.676, output: -1.180, loss: 0.254  
i: 51, target: -1.119, output: -1.503, loss: 0.147  
i: 52, target: 9.334, output: 9.403, loss: 0.005  
i: 53, target: -0.387, output: -0.004, loss: 0.147

i: 54, target: -1.196, output: -0.808, loss: 0.150  
i: 55, target: 9.063, output: 9.203, loss: 0.019  
i: 56, target: -0.765, output: -1.100, loss: 0.112  
i: 57, target: -1.671, output: -1.065, loss: 0.367  
i: 58, target: -1.195, output: -0.927, loss: 0.072  
i: 59, target: -1.344, output: -1.392, loss: 0.002  
i: 60, target: -0.625, output: -0.951, loss: 0.106  
i: 61, target: 0.621, output: -0.016, loss: 0.405  
i: 62, target: -1.502, output: -1.444, loss: 0.003  
i: 63, target: -1.893, output: -0.901, loss: 0.984  
i: 64, target: -1.048, output: -1.285, loss: 0.056  
i: 65, target: -1.311, output: -1.216, loss: 0.009  
i: 66, target: -1.415, output: -1.149, loss: 0.071  
i: 67, target: 0.157, output: -0.070, loss: 0.051  
i: 68, target: -0.401, output: -1.307, loss: 0.821  
i: 69, target: -0.558, output: -0.525, loss: 0.001  
i: 70, target: -1.945, output: -0.996, loss: 0.899  
i: 71, target: -0.494, output: -0.769, loss: 0.076  
i: 72, target: -1.240, output: -1.233, loss: 0.000  
i: 73, target: -0.946, output: -0.759, loss: 0.035  
i: 74, target: -1.168, output: -0.933, loss: 0.055  
i: 75, target: -1.687, output: -1.514, loss: 0.030  
i: 76, target: 0.567, output: 0.042, loss: 0.275  
i: 77, target: -0.289, output: -0.800, loss: 0.261

i: 78, target: -0.637, output: -0.572, loss: 0.004  
i: 79, target: -1.154, output: -1.097, loss: 0.003  
i: 80, target: -1.229, output: -0.779, loss: 0.202  
i: 81, target: 8.672, output: 9.161, loss: 0.240  
i: 82, target: -1.163, output: -1.299, loss: 0.018  
i: 83, target: 9.671, output: 9.063, loss: 0.370  
i: 84, target: -0.936, output: -0.834, loss: 0.010  
i: 85, target: -1.387, output: -1.248, loss: 0.019  
i: 86, target: -1.065, output: -0.865, loss: 0.040  
i: 87, target: -0.442, output: -1.171, loss: 0.531  
i: 88, target: -1.028, output: -1.310, loss: 0.079  
i: 89, target: 0.498, output: 0.301, loss: 0.039  
i: 90, target: -1.522, output: -1.507, loss: 0.000  
i: 91, target: -1.275, output: -1.266, loss: 0.000  
i: 92, target: -0.967, output: -1.055, loss: 0.008  
i: 93, target: -1.360, output: -1.325, loss: 0.001  
i: 94, target: -0.623, output: -0.837, loss: 0.046  
i: 95, target: -1.523, output: -1.146, loss: 0.142  
i: 96, target: 9.025, output: 9.084, loss: 0.003  
i: 97, target: -1.323, output: -1.067, loss: 0.066  
i: 98, target: -0.397, output: -0.841, loss: 0.197  
i: 99, target: -1.010, output: -1.569, loss: 0.312  
i: 100, target: -1.060, output: -1.277, loss: 0.047  
i: 101, target: -0.845, output: -1.207, loss: 0.131

i: 102, target: -0.706, output: -0.895, loss: 0.036  
i: 103, target: -1.329, output: -0.823, loss: 0.256  
i: 104, target: -1.119, output: -1.163, loss: 0.002  
i: 105, target: 0.082, output: 0.186, loss: 0.011  
i: 106, target: -0.885, output: -0.830, loss: 0.003  
i: 107, target: -1.648, output: -0.964, loss: 0.468  
i: 108, target: -0.887, output: -1.231, loss: 0.118  
i: 109, target: -0.734, output: -1.091, loss: 0.127  
i: 110, target: -0.723, output: -0.867, loss: 0.021  
i: 111, target: -0.288, output: -0.799, loss: 0.261  
i: 112, target: -1.225, output: -1.277, loss: 0.003  
i: 113, target: -1.092, output: -1.033, loss: 0.004  
i: 114, target: -1.307, output: -0.943, loss: 0.132  
i: 115, target: -1.086, output: -0.750, loss: 0.113  
i: 116, target: -0.621, output: -0.994, loss: 0.138  
i: 117, target: -1.037, output: -1.337, loss: 0.090  
i: 118, target: -0.731, output: -1.250, loss: 0.269  
i: 119, target: -1.069, output: -1.279, loss: 0.044  
i: 120, target: -0.609, output: -0.999, loss: 0.152  
i: 121, target: 9.041, output: 9.186, loss: 0.021  
i: 122, target: -0.784, output: -1.208, loss: 0.180  
i: 123, target: -0.675, output: -0.973, loss: 0.089  
i: 124, target: -1.718, output: -1.510, loss: 0.043  
i: 125, target: -1.324, output: -1.029, loss: 0.087

i: 126, target: -0.802, output: -1.175, loss: 0.139  
i: 127, target: 8.890, output: 9.065, loss: 0.031  
i: 128, target: 0.607, output: 0.147, loss: 0.212  
i: 129, target: -1.577, output: -0.867, loss: 0.503  
i: 130, target: -0.371, output: -0.583, loss: 0.045  
i: 131, target: -1.660, output: -0.769, loss: 0.794  
i: 132, target: -1.474, output: -1.604, loss: 0.017  
i: 133, target: -0.896, output: -1.162, loss: 0.071  
i: 134, target: -0.468, output: -1.053, loss: 0.342  
i: 135, target: -0.180, output: -1.088, loss: 0.824  
i: 136, target: -1.925, output: -1.133, loss: 0.628  
i: 137, target: -0.943, output: -1.446, loss: 0.254  
i: 138, target: -0.314, output: -1.283, loss: 0.938  
i: 139, target: -0.652, output: -0.940, loss: 0.083  
i: 140, target: -1.195, output: -1.125, loss: 0.005  
i: 141, target: -0.476, output: -0.970, loss: 0.243  
i: 142, target: -0.522, output: -0.604, loss: 0.007  
i: 143, target: -0.721, output: -0.916, loss: 0.038  
i: 144, target: -0.734, output: -0.757, loss: 0.001  
i: 145, target: -0.813, output: -1.020, loss: 0.043  
i: 146, target: -0.565, output: -1.199, loss: 0.402  
i: 147, target: -1.241, output: -1.099, loss: 0.020  
i: 148, target: -1.559, output: -1.578, loss: 0.000  
i: 149, target: -0.694, output: -0.716, loss: 0.000



i: 150, target: -1.574, output: -1.026, loss: 0.300  
i: 151, target: -2.059, output: -1.823, loss: 0.056  
i: 152, target: -0.791, output: -1.061, loss: 0.073  
i: 153, target: -1.343, output: -1.351, loss: 0.000  
i: 154, target: -1.418, output: -0.972, loss: 0.199  
i: 155, target: -0.468, output: -1.008, loss: 0.292  
i: 156, target: -0.908, output: -0.728, loss: 0.033  
i: 157, target: -0.405, output: -0.943, loss: 0.289  
i: 158, target: -0.945, output: -1.179, loss: 0.054  
i: 159, target: -0.592, output: -0.975, loss: 0.147  
i: 160, target: -0.563, output: -0.948, loss: 0.148  
i: 161, target: -0.622, output: -1.212, loss: 0.349  
i: 162, target: -1.689, output: -1.147, loss: 0.293  
i: 163, target: -0.855, output: -0.804, loss: 0.003  
i: 164, target: -1.728, output: -1.122, loss: 0.367  
i: 165, target: -0.693, output: -1.574, loss: 0.778  
i: 166, target: -0.713, output: -0.869, loss: 0.024  
i: 167, target: -0.609, output: -0.904, loss: 0.087  
i: 168, target: -0.358, output: -0.697, loss: 0.115  
i: 169, target: -0.848, output: -0.608, loss: 0.058  
i: 170, target: -1.880, output: -0.795, loss: 1.177  
i: 171, target: -1.088, output: -1.615, loss: 0.277  
i: 172, target: -1.206, output: -1.494, loss: 0.083  
i: 173, target: -0.702, output: -0.861, loss: 0.025

i: 174, target: -0.993, output: -1.054, loss: 0.004  
i: 175, target: -0.480, output: -1.082, loss: 0.363  
i: 176, target: 9.549, output: 9.495, loss: 0.003  
i: 177, target: -1.406, output: -0.967, loss: 0.193  
i: 178, target: -1.480, output: -1.131, loss: 0.122  
i: 179, target: -1.671, output: -0.790, loss: 0.776  
i: 180, target: -1.521, output: -0.936, loss: 0.343  
i: 181, target: -1.192, output: -1.592, loss: 0.160  
i: 182, target: 9.706, output: 9.506, loss: 0.040  
i: 183, target: -1.830, output: -1.176, loss: 0.427  
i: 184, target: -1.193, output: -0.997, loss: 0.039  
i: 185, target: -1.297, output: -0.955, loss: 0.117  
i: 186, target: -0.871, output: -1.047, loss: 0.031  
i: 187, target: -0.603, output: -0.846, loss: 0.059  
i: 188, target: 9.706, output: 9.367, loss: 0.115  
i: 189, target: 0.067, output: -0.165, loss: 0.054  
i: 190, target: -1.140, output: -0.948, loss: 0.037  
i: 191, target: -0.964, output: -1.107, loss: 0.020  
i: 192, target: -0.581, output: -1.125, loss: 0.296  
i: 193, target: -0.550, output: -0.716, loss: 0.028  
i: 194, target: -1.392, output: -0.951, loss: 0.194  
i: 195, target: -1.374, output: -1.299, loss: 0.006  
i: 196, target: -1.103, output: -0.982, loss: 0.015  
i: 197, target: -1.314, output: -1.722, loss: 0.167

i: 198, target: -1.408, output: -1.486, loss: 0.006  
i: 199, target: -0.739, output: -0.632, loss: 0.012  
i: 200, target: -1.164, output: -0.952, loss: 0.045  
i: 201, target: -1.544, output: -1.375, loss: 0.028  
i: 202, target: -1.421, output: -1.121, loss: 0.090  
i: 203, target: -1.253, output: -1.099, loss: 0.024  
i: 204, target: -0.337, output: -0.672, loss: 0.112  
i: 205, target: -1.418, output: -1.108, loss: 0.096  
i: 206, target: -0.617, output: -0.718, loss: 0.010  
i: 207, target: -0.628, output: -0.905, loss: 0.077  
i: 208, target: -0.966, output: -0.875, loss: 0.008  
i: 209, target: -1.248, output: -1.056, loss: 0.037  
i: 210, target: -1.728, output: -1.418, loss: 0.096  
i: 211, target: -0.377, output: -0.629, loss: 0.064  
i: 212, target: -0.589, output: -1.047, loss: 0.210  
i: 213, target: -1.218, output: -0.913, loss: 0.093  
i: 214, target: -0.972, output: -0.702, loss: 0.073  
i: 215, target: -1.217, output: -1.386, loss: 0.029  
i: 216, target: -0.411, output: -0.641, loss: 0.053  
i: 217, target: -0.638, output: -0.888, loss: 0.063  
i: 218, target: -1.577, output: -0.771, loss: 0.650  
i: 219, target: -0.663, output: -1.236, loss: 0.328  
i: 220, target: -0.480, output: -1.206, loss: 0.527  
i: 221, target: -0.737, output: -1.105, loss: 0.135

i: 222, target: -0.235, output: -0.116, loss: 0.014  
i: 223, target: -0.781, output: -0.890, loss: 0.012  
i: 224, target: 9.624, output: 9.166, loss: 0.209  
i: 225, target: -0.406, output: -0.742, loss: 0.113  
i: 226, target: -1.801, output: -1.253, loss: 0.300  
i: 227, target: -2.679, output: -0.971, loss: 2.916  
i: 228, target: -1.424, output: -0.920, loss: 0.254  
i: 229, target: -0.685, output: -1.144, loss: 0.211  
i: 230, target: 0.474, output: 0.172, loss: 0.091  
i: 231, target: -1.141, output: -1.114, loss: 0.001  
i: 232, target: -1.045, output: -1.589, loss: 0.295  
i: 233, target: -0.977, output: -0.715, loss: 0.069  
i: 234, target: -0.389, output: -1.180, loss: 0.626  
i: 235, target: -1.157, output: -1.559, loss: 0.162  
i: 236, target: 8.805, output: 9.491, loss: 0.470  
i: 237, target: -1.316, output: -0.928, loss: 0.150  
i: 238, target: -1.426, output: -0.918, loss: 0.259  
i: 239, target: -0.997, output: -1.221, loss: 0.050  
i: 240, target: 9.440, output: 9.354, loss: 0.007  
i: 241, target: -2.645, output: -1.781, loss: 0.747  
i: 242, target: -0.609, output: -0.796, loss: 0.035  
i: 243, target: -1.458, output: -1.279, loss: 0.032  
i: 244, target: -0.745, output: -1.077, loss: 0.110  
i: 245, target: -1.255, output: -1.290, loss: 0.001

i: 246, target: -1.355, output: -1.327, loss: 0.001  
i: 247, target: -1.935, output: -1.571, loss: 0.133  
i: 248, target: -0.184, output: 0.188, loss: 0.139  
i: 249, target: 0.639, output: 0.269, loss: 0.137  
i: 250, target: -1.415, output: -0.936, loss: 0.230  
i: 251, target: -0.991, output: -1.224, loss: 0.054  
i: 252, target: -0.451, output: -0.985, loss: 0.285  
i: 253, target: -1.707, output: -1.434, loss: 0.075  
i: 254, target: -0.911, output: -0.984, loss: 0.005  
i: 255, target: 0.475, output: 0.047, loss: 0.183  
i: 256, target: -1.288, output: -0.770, loss: 0.268  
i: 257, target: -0.638, output: -1.074, loss: 0.190  
i: 258, target: -1.445, output: -0.927, loss: 0.269  
i: 259, target: -0.402, output: -0.958, loss: 0.309  
i: 260, target: -1.218, output: -1.347, loss: 0.017  
i: 261, target: -0.607, output: -1.204, loss: 0.356  
i: 262, target: -0.364, output: -0.819, loss: 0.206  
i: 263, target: -1.455, output: -1.369, loss: 0.007  
i: 264, target: 8.882, output: 8.928, loss: 0.002  
i: 265, target: -0.601, output: -0.877, loss: 0.077  
i: 266, target: -0.927, output: -0.743, loss: 0.034  
i: 267, target: -1.200, output: -0.991, loss: 0.043  
i: 268, target: -1.856, output: -1.438, loss: 0.175  
i: 269, target: -0.742, output: -0.921, loss: 0.032

i: 270, target: -0.775, output: -0.854, loss: 0.006  
i: 271, target: -0.323, output: 0.205, loss: 0.279  
i: 272, target: -0.907, output: -0.835, loss: 0.005  
i: 273, target: -0.727, output: -0.881, loss: 0.024  
i: 274, target: -0.936, output: -1.169, loss: 0.055  
i: 275, target: -0.694, output: -1.118, loss: 0.180  
i: 276, target: -1.138, output: -0.918, loss: 0.048  
i: 277, target: -0.820, output: -1.037, loss: 0.047  
i: 278, target: -0.658, output: -0.931, loss: 0.075  
i: 279, target: -0.758, output: -0.816, loss: 0.003  
i: 280, target: -0.635, output: -0.885, loss: 0.062  
i: 281, target: -2.173, output: -1.272, loss: 0.812  
i: 282, target: -0.453, output: -0.979, loss: 0.276  
i: 283, target: -0.876, output: -0.738, loss: 0.019  
i: 284, target: -1.654, output: -1.742, loss: 0.008  
i: 285, target: -0.698, output: -1.085, loss: 0.150  
i: 286, target: -1.371, output: -0.862, loss: 0.259  
i: 287, target: -1.571, output: -1.470, loss: 0.010  
i: 288, target: 0.484, output: 0.162, loss: 0.103  
i: 289, target: -0.741, output: -1.129, loss: 0.151  
i: 290, target: -1.180, output: -1.144, loss: 0.001  
i: 291, target: -2.249, output: -0.973, loss: 1.629  
i: 292, target: -0.294, output: -1.247, loss: 0.908  
i: 293, target: -0.675, output: -0.802, loss: 0.016

i: 294, target: -0.590, output: -0.680, loss: 0.008  
i: 295, target: 8.852, output: 9.433, loss: 0.338  
i: 296, target: -0.556, output: -1.151, loss: 0.355  
i: 297, target: -1.055, output: -1.331, loss: 0.077  
i: 298, target: -0.890, output: -1.120, loss: 0.053  
i: 299, target: -0.951, output: -0.961, loss: 0.000  
i: 300, target: -1.223, output: -1.015, loss: 0.043  
i: 301, target: -1.013, output: -1.188, loss: 0.031  
i: 302, target: -0.598, output: -1.171, loss: 0.329  
i: 303, target: -0.987, output: -1.183, loss: 0.039  
i: 304, target: 9.626, output: 9.077, loss: 0.302  
i: 305, target: -0.624, output: -1.052, loss: 0.183  
i: 306, target: -1.884, output: -1.081, loss: 0.645  
i: 307, target: -0.278, output: -0.092, loss: 0.035  
i: 308, target: 0.595, output: -0.172, loss: 0.588  
i: 309, target: -0.777, output: -1.220, loss: 0.196  
i: 310, target: 9.618, output: 9.094, loss: 0.274  
i: 311, target: -0.647, output: -0.727, loss: 0.006  
i: 312, target: -1.865, output: -1.333, loss: 0.283  
i: 313, target: -1.393, output: -0.889, loss: 0.254  
i: 314, target: 0.397, output: 0.212, loss: 0.034  
i: 315, target: -1.313, output: -1.111, loss: 0.041  
i: 316, target: -0.929, output: -1.007, loss: 0.006  
i: 317, target: 0.288, output: 0.312, loss: 0.001

i: 318, target: -0.483, output: -1.109, loss: 0.392  
i: 319, target: -1.471, output: -1.377, loss: 0.009  
i: 320, target: 9.225, output: 9.496, loss: 0.073  
i: 321, target: 9.337, output: 9.498, loss: 0.026  
i: 322, target: -0.757, output: -0.927, loss: 0.029  
i: 323, target: -0.899, output: -0.970, loss: 0.005  
i: 324, target: -1.347, output: -1.119, loss: 0.052  
i: 325, target: -0.732, output: -0.726, loss: 0.000  
i: 326, target: 8.976, output: 9.006, loss: 0.001  
i: 327, target: -0.642, output: -0.938, loss: 0.087  
i: 328, target: -0.848, output: -1.171, loss: 0.104  
i: 329, target: -0.656, output: -1.143, loss: 0.237  
i: 330, target: -1.028, output: -1.398, loss: 0.137  
i: 331, target: -0.707, output: -0.745, loss: 0.001  
i: 332, target: -1.341, output: -1.199, loss: 0.020  
i: 333, target: -1.626, output: -1.501, loss: 0.016  
i: 334, target: -1.372, output: -1.466, loss: 0.009  
i: 335, target: -0.991, output: -1.172, loss: 0.033  
i: 336, target: -0.515, output: -0.581, loss: 0.004  
i: 337, target: -1.441, output: -1.177, loss: 0.070  
i: 338, target: -1.853, output: -1.676, loss: 0.031  
i: 339, target: -0.496, output: -0.925, loss: 0.184  
i: 340, target: -0.679, output: -1.052, loss: 0.139  
i: 341, target: -1.026, output: -0.815, loss: 0.044



i: 342, target: -0.237, output: -0.847, loss: 0.372  
i: 343, target: -0.971, output: -0.921, loss: 0.003  
i: 344, target: -1.627, output: -1.491, loss: 0.018  
i: 345, target: -2.069, output: -1.394, loss: 0.456  
i: 346, target: -1.081, output: -1.026, loss: 0.003  
i: 347, target: -0.833, output: -1.184, loss: 0.123  
i: 348, target: -0.796, output: -1.297, loss: 0.251  
i: 349, target: -0.750, output: -1.067, loss: 0.100  
i: 350, target: -0.727, output: -0.814, loss: 0.008  
i: 351, target: -2.027, output: -0.931, loss: 1.202  
i: 352, target: -0.255, output: -0.778, loss: 0.274  
i: 353, target: -0.503, output: -1.106, loss: 0.363  
i: 354, target: -0.847, output: -1.178, loss: 0.110  
i: 355, target: 8.921, output: 9.305, loss: 0.147  
i: 356, target: -1.810, output: -1.108, loss: 0.492  
i: 357, target: -0.770, output: -1.048, loss: 0.077  
i: 358, target: -0.544, output: -1.126, loss: 0.339  
i: 359, target: 0.611, output: -0.098, loss: 0.503  
i: 360, target: -1.437, output: -1.115, loss: 0.104  
i: 361, target: -1.307, output: -0.756, loss: 0.303  
i: 362, target: -0.911, output: -1.070, loss: 0.025  
i: 363, target: 8.240, output: 9.012, loss: 0.595  
i: 364, target: -2.005, output: -1.584, loss: 0.177  
i: 365, target: -1.722, output: -1.619, loss: 0.011

i: 366, target: -0.892, output: -0.648, loss: 0.059  
i: 367, target: -1.314, output: -1.203, loss: 0.012  
i: 368, target: -0.806, output: -0.870, loss: 0.004  
i: 369, target: -1.238, output: -1.531, loss: 0.086  
i: 370, target: -1.204, output: -1.452, loss: 0.062  
i: 371, target: -2.115, output: -1.420, loss: 0.483  
i: 372, target: -1.288, output: -1.367, loss: 0.006  
i: 373, target: -0.324, output: -0.247, loss: 0.006  
i: 374, target: -0.995, output: -0.950, loss: 0.002  
i: 375, target: 0.467, output: 0.015, loss: 0.204  
i: 376, target: -0.474, output: -0.710, loss: 0.056  
i: 377, target: -0.741, output: -1.353, loss: 0.374  
i: 378, target: -0.732, output: -0.875, loss: 0.020  
i: 379, target: -2.364, output: -1.324, loss: 1.082  
i: 380, target: -1.394, output: -0.848, loss: 0.298  
i: 381, target: -0.762, output: -0.828, loss: 0.004  
i: 382, target: -2.159, output: -1.307, loss: 0.727  
i: 383, target: -0.987, output: -0.910, loss: 0.006  
i: 384, target: -0.577, output: -0.962, loss: 0.148  
i: 385, target: -1.166, output: -1.662, loss: 0.246  
i: 386, target: -1.024, output: -1.419, loss: 0.156  
i: 387, target: -1.395, output: -1.043, loss: 0.124  
i: 388, target: -0.311, output: -0.871, loss: 0.313  
i: 389, target: -1.650, output: -1.122, loss: 0.279

i: 390, target: -1.566, output: -0.845, loss: 0.520  
i: 391, target: -0.595, output: -1.197, loss: 0.363  
i: 392, target: -1.781, output: -1.323, loss: 0.210  
i: 393, target: -1.208, output: -0.804, loss: 0.164  
i: 394, target: -1.039, output: -0.714, loss: 0.106  
i: 395, target: -1.464, output: -1.465, loss: 0.000  
i: 396, target: -0.595, output: -1.060, loss: 0.216  
i: 397, target: -0.844, output: -0.718, loss: 0.016  
i: 398, target: -2.552, output: -1.507, loss: 1.092  
i: 399, target: -1.613, output: -1.114, loss: 0.249  
i: 400, target: -0.714, output: -0.934, loss: 0.048  
i: 401, target: -1.440, output: -1.351, loss: 0.008  
i: 402, target: -0.703, output: -0.947, loss: 0.059  
i: 403, target: -0.635, output: -0.776, loss: 0.020  
i: 404, target: -1.058, output: -0.887, loss: 0.029  
i: 405, target: -0.722, output: -0.803, loss: 0.007  
i: 406, target: 9.551, output: 9.303, loss: 0.062  
i: 407, target: -0.438, output: -1.152, loss: 0.509  
i: 408, target: -0.552, output: -1.097, loss: 0.297  
i: 409, target: -0.414, output: -0.753, loss: 0.115  
i: 410, target: 8.166, output: 9.026, loss: 0.739  
i: 411, target: -1.347, output: -1.498, loss: 0.023  
i: 412, target: -1.341, output: -0.798, loss: 0.295  
i: 413, target: -2.061, output: -1.723, loss: 0.114

i: 414, target: -1.398, output: -1.379, loss: 0.000  
i: 415, target: -1.166, output: -1.183, loss: 0.000  
i: 416, target: -0.466, output: -0.640, loss: 0.030  
i: 417, target: -1.200, output: -1.532, loss: 0.110  
i: 418, target: -0.228, output: 0.194, loss: 0.178  
i: 419, target: -1.749, output: -1.525, loss: 0.050  
i: 420, target: -0.653, output: -1.103, loss: 0.203  
i: 421, target: -0.712, output: -1.077, loss: 0.133  
i: 422, target: -0.559, output: -0.828, loss: 0.072  
i: 423, target: -1.393, output: -0.850, loss: 0.295  
i: 424, target: -1.294, output: -0.945, loss: 0.122  
i: 425, target: -1.699, output: -1.595, loss: 0.011  
i: 426, target: -0.370, output: -1.154, loss: 0.615  
i: 427, target: -1.113, output: -1.032, loss: 0.006  
i: 428, target: -1.086, output: -1.731, loss: 0.416  
i: 429, target: -0.659, output: -1.022, loss: 0.132  
i: 430, target: -1.373, output: -1.583, loss: 0.044  
i: 431, target: -1.628, output: -1.233, loss: 0.156  
i: 432, target: -0.820, output: -0.862, loss: 0.002  
i: 433, target: -0.492, output: -1.024, loss: 0.283  
i: 434, target: -1.032, output: -1.242, loss: 0.044  
i: 435, target: 0.503, output: 0.282, loss: 0.049  
i: 436, target: -1.307, output: -1.251, loss: 0.003  
i: 437, target: -1.047, output: -1.013, loss: 0.001

i: 438, target: -1.937, output: -1.755, loss: 0.033  
i: 439, target: -1.081, output: -1.080, loss: 0.000  
i: 440, target: 0.496, output: 0.312, loss: 0.034  
i: 441, target: -0.843, output: -0.873, loss: 0.001  
i: 442, target: 9.584, output: 9.499, loss: 0.007  
i: 443, target: -0.471, output: -0.991, loss: 0.270  
i: 444, target: -0.312, output: -0.929, loss: 0.381  
i: 445, target: -0.313, output: -0.519, loss: 0.042  
i: 446, target: -0.657, output: -0.772, loss: 0.013  
i: 447, target: -1.592, output: -1.149, loss: 0.196  
i: 448, target: -1.169, output: -0.864, loss: 0.093  
i: 449, target: -0.223, output: -0.838, loss: 0.379  
i: 450, target: -1.415, output: -1.623, loss: 0.043  
i: 451, target: -1.139, output: -1.521, loss: 0.145  
i: 452, target: -1.765, output: -0.865, loss: 0.810  
i: 453, target: -0.821, output: -1.462, loss: 0.411  
i: 454, target: -1.031, output: -0.845, loss: 0.035  
i: 455, target: -1.103, output: -1.001, loss: 0.010  
i: 456, target: -1.011, output: -1.464, loss: 0.205  
i: 457, target: -0.866, output: -0.937, loss: 0.005  
i: 458, target: -0.644, output: -0.839, loss: 0.038  
i: 459, target: -1.885, output: -1.495, loss: 0.152  
i: 460, target: -0.403, output: -0.897, loss: 0.245  
i: 461, target: -0.223, output: -0.778, loss: 0.308

i: 462, target: -0.498, output: -0.973, loss: 0.226  
i: 463, target: -1.453, output: -1.312, loss: 0.020  
i: 464, target: -0.259, output: -1.217, loss: 0.919  
i: 465, target: 0.693, output: 0.127, loss: 0.321  
i: 466, target: -0.747, output: -0.957, loss: 0.044  
i: 467, target: -0.762, output: -0.798, loss: 0.001  
i: 468, target: -1.277, output: -0.963, loss: 0.098  
i: 469, target: -0.362, output: -0.637, loss: 0.076  
i: 470, target: -1.437, output: -1.111, loss: 0.106  
i: 471, target: -1.498, output: -0.912, loss: 0.345  
i: 472, target: -1.106, output: -0.938, loss: 0.028  
i: 473, target: -0.874, output: -1.084, loss: 0.044  
i: 474, target: -2.006, output: -1.655, loss: 0.123  
i: 475, target: -0.212, output: -1.267, loss: 1.113  
i: 476, target: -0.516, output: -0.655, loss: 0.019  
i: 477, target: -1.180, output: -0.755, loss: 0.181  
i: 478, target: -2.330, output: -1.556, loss: 0.600  
i: 479, target: -0.540, output: -0.937, loss: 0.157  
i: 480, target: -1.186, output: -0.746, loss: 0.194  
i: 481, target: -0.696, output: -0.943, loss: 0.061  
i: 482, target: -0.344, output: 0.284, loss: 0.394  
i: 483, target: -0.555, output: -1.145, loss: 0.348  
i: 484, target: -1.366, output: -1.250, loss: 0.014  
i: 485, target: -0.478, output: -1.158, loss: 0.463

i: 486, target: -0.940, output: -0.853, loss: 0.008  
i: 487, target: -1.330, output: -1.162, loss: 0.028  
i: 488, target: -1.535, output: -1.307, loss: 0.052  
i: 489, target: -0.792, output: -0.680, loss: 0.013  
i: 490, target: 0.562, output: 0.331, loss: 0.054  
i: 491, target: -0.884, output: -1.119, loss: 0.055  
i: 492, target: -1.453, output: -1.346, loss: 0.011  
i: 493, target: -0.534, output: -1.254, loss: 0.519  
i: 494, target: -1.057, output: -1.498, loss: 0.194  
i: 495, target: -0.799, output: -0.785, loss: 0.000  
i: 496, target: -0.417, output: -0.260, loss: 0.025  
i: 497, target: -0.748, output: -1.152, loss: 0.164  
i: 498, target: -1.274, output: -1.533, loss: 0.067  
i: 499, target: -1.058, output: -1.515, loss: 0.209  
i: 500, target: 0.106, output: -0.109, loss: 0.046  
i: 501, target: -0.571, output: -0.673, loss: 0.010  
i: 502, target: -0.387, output: -0.004, loss: 0.147  
i: 503, target: -1.355, output: -1.068, loss: 0.083  
i: 504, target: -1.213, output: -1.375, loss: 0.026  
i: 505, target: -0.776, output: -1.058, loss: 0.080  
i: 506, target: -1.110, output: -0.657, loss: 0.205  
i: 507, target: -0.375, output: -0.838, loss: 0.215  
i: 508, target: -1.619, output: -1.685, loss: 0.004  
i: 509, target: -0.583, output: -0.780, loss: 0.039

i: 510, target: -0.783, output: -0.715, loss: 0.005  
i: 511, target: -0.669, output: -0.635, loss: 0.001  
i: 512, target: -1.278, output: -0.945, loss: 0.111  
i: 513, target: -0.496, output: -0.753, loss: 0.066  
i: 514, target: 0.312, output: 0.182, loss: 0.017  
i: 515, target: -0.437, output: -1.163, loss: 0.527  
i: 516, target: -0.707, output: -0.922, loss: 0.046  
i: 517, target: -1.381, output: -1.094, loss: 0.083  
i: 518, target: -0.741, output: -1.153, loss: 0.170  
i: 519, target: -0.637, output: -0.773, loss: 0.018  
i: 520, target: -1.398, output: -1.267, loss: 0.017  
i: 521, target: -1.025, output: -1.195, loss: 0.029  
i: 522, target: -1.012, output: -1.024, loss: 0.000  
i: 523, target: -0.745, output: -1.157, loss: 0.170  
i: 524, target: -0.531, output: -0.684, loss: 0.023  
i: 525, target: -0.912, output: -0.779, loss: 0.018  
i: 526, target: -0.639, output: -1.203, loss: 0.318  
i: 527, target: -1.333, output: -1.033, loss: 0.090  
i: 528, target: 9.765, output: 9.253, loss: 0.262  
i: 529, target: -0.722, output: -1.218, loss: 0.246  
i: 530, target: -0.652, output: -0.688, loss: 0.001  
i: 531, target: -0.796, output: -1.154, loss: 0.128  
i: 532, target: -0.570, output: -1.434, loss: 0.746  
i: 533, target: -1.181, output: -1.581, loss: 0.160



i: 534, target: 0.365, output: 0.103, loss: 0.069  
i: 535, target: -0.054, output: -0.450, loss: 0.156  
i: 536, target: -1.029, output: -0.905, loss: 0.015  
i: 537, target: -0.791, output: -1.166, loss: 0.140  
i: 538, target: -0.546, output: -0.797, loss: 0.063  
i: 539, target: -0.896, output: -1.162, loss: 0.071  
i: 540, target: -1.180, output: -1.189, loss: 0.000  
i: 541, target: -0.993, output: -0.808, loss: 0.034  
i: 542, target: -1.144, output: -1.271, loss: 0.016  
i: 543, target: -1.598, output: -1.187, loss: 0.169  
i: 544, target: -2.826, output: -1.373, loss: 2.109  
i: 545, target: -0.416, output: -0.710, loss: 0.087  
i: 546, target: -0.511, output: -0.974, loss: 0.215  
i: 547, target: -1.109, output: -1.037, loss: 0.005  
i: 548, target: -0.602, output: -0.888, loss: 0.082  
i: 549, target: -0.908, output: -1.149, loss: 0.058  
i: 550, target: -1.029, output: -0.748, loss: 0.079  
i: 551, target: 8.821, output: 9.073, loss: 0.064  
i: 552, target: 9.660, output: 9.265, loss: 0.156  
i: 553, target: -0.957, output: -0.937, loss: 0.000  
i: 554, target: -0.943, output: -1.244, loss: 0.091  
i: 555, target: -0.289, output: -1.303, loss: 1.028  
i: 556, target: -1.064, output: -1.356, loss: 0.085  
i: 557, target: -1.723, output: -1.276, loss: 0.200

i: 558, target: -0.684, output: -1.026, loss: 0.117  
i: 559, target: -0.722, output: -0.916, loss: 0.038  
i: 560, target: -0.481, output: -0.733, loss: 0.063  
i: 561, target: -1.295, output: -0.813, loss: 0.232  
i: 562, target: -0.750, output: -1.409, loss: 0.435  
i: 563, target: -1.103, output: -1.173, loss: 0.005  
i: 564, target: -1.737, output: -1.288, loss: 0.201  
i: 565, target: -1.425, output: -1.236, loss: 0.036  
i: 566, target: -0.461, output: -0.824, loss: 0.132  
i: 567, target: -1.571, output: -1.177, loss: 0.156  
i: 568, target: 8.974, output: 9.444, loss: 0.221  
i: 569, target: -0.546, output: -0.675, loss: 0.017  
i: 570, target: -0.895, output: -0.825, loss: 0.005  
i: 571, target: -0.650, output: -1.014, loss: 0.133  
i: 572, target: -0.561, output: -0.930, loss: 0.136  
i: 573, target: -0.592, output: -0.936, loss: 0.118  
i: 574, target: -2.003, output: -1.670, loss: 0.111  
i: 575, target: -0.712, output: -1.427, loss: 0.512  
i: 576, target: -1.213, output: -1.264, loss: 0.003  
i: 577, target: -0.749, output: -1.021, loss: 0.074  
i: 578, target: -0.537, output: -0.829, loss: 0.085  
i: 579, target: -0.581, output: -0.835, loss: 0.064  
i: 580, target: -0.291, output: -0.858, loss: 0.322  
i: 581, target: -0.680, output: -0.610, loss: 0.005

i: 582, target: -0.552, output: -0.889, loss: 0.113  
i: 583, target: -1.257, output: -0.935, loss: 0.103  
i: 584, target: -1.094, output: -0.860, loss: 0.055  
i: 585, target: -2.367, output: -1.483, loss: 0.782  
i: 586, target: -1.462, output: -1.237, loss: 0.051  
i: 587, target: -1.353, output: -1.053, loss: 0.090  
i: 588, target: -1.380, output: -0.889, loss: 0.241  
i: 589, target: -0.541, output: -1.034, loss: 0.244  
i: 590, target: -1.028, output: -0.733, loss: 0.087  
i: 591, target: -0.409, output: -1.325, loss: 0.838  
i: 592, target: 9.908, output: 9.114, loss: 0.630  
i: 593, target: -1.984, output: -1.348, loss: 0.405  
i: 594, target: 0.483, output: 0.016, loss: 0.218  
i: 595, target: -0.273, output: -1.303, loss: 1.061  
i: 596, target: -0.472, output: -1.084, loss: 0.375  
i: 597, target: -0.608, output: -0.635, loss: 0.001  
i: 598, target: -0.824, output: -1.218, loss: 0.155  
i: 599, target: -1.106, output: -1.401, loss: 0.087  
i: 600, target: -1.532, output: -1.768, loss: 0.056  
i: 601, target: -0.992, output: -0.721, loss: 0.073  
i: 602, target: -0.687, output: -0.753, loss: 0.004  
i: 603, target: -0.715, output: -0.764, loss: 0.002  
i: 604, target: -1.833, output: -1.039, loss: 0.631  
i: 605, target: -0.715, output: -0.888, loss: 0.030

i: 606, target: -0.678, output: -0.952, loss: 0.075  
i: 607, target: -0.765, output: -0.922, loss: 0.025  
i: 608, target: -0.371, output: -0.955, loss: 0.341  
i: 609, target: -0.625, output: -0.813, loss: 0.035  
i: 610, target: -0.543, output: -1.261, loss: 0.517  
i: 611, target: 0.538, output: 0.323, loss: 0.046  
i: 612, target: -2.262, output: -1.765, loss: 0.247  
i: 613, target: -1.220, output: -1.563, loss: 0.117  
i: 614, target: 9.642, output: 9.251, loss: 0.153  
i: 615, target: -1.248, output: -1.422, loss: 0.030  
i: 616, target: -1.859, output: -1.224, loss: 0.404  
i: 617, target: -1.310, output: -1.194, loss: 0.013  
i: 618, target: -1.383, output: -1.544, loss: 0.026  
i: 619, target: -1.184, output: -0.861, loss: 0.104  
i: 620, target: -0.927, output: -1.031, loss: 0.011  
i: 621, target: -0.686, output: -1.393, loss: 0.500  
i: 622, target: -1.860, output: -1.110, loss: 0.563  
i: 623, target: 0.097, output: -0.782, loss: 0.771  
i: 624, target: -0.602, output: -0.648, loss: 0.002  
i: 625, target: -0.966, output: -0.787, loss: 0.032  
i: 626, target: -1.061, output: -1.215, loss: 0.024  
i: 627, target: -0.646, output: -1.458, loss: 0.659  
i: 628, target: 0.527, output: 0.167, loss: 0.130  
i: 629, target: -0.958, output: -0.956, loss: 0.000

i: 630, target: 0.499, output: -0.126, loss: 0.391  
i: 631, target: -2.450, output: -1.769, loss: 0.463  
i: 632, target: -1.574, output: -1.574, loss: 0.000  
i: 633, target: -1.379, output: -1.081, loss: 0.089  
i: 634, target: -2.384, output: -1.319, loss: 1.134  
i: 635, target: -0.302, output: -1.040, loss: 0.545  
i: 636, target: -1.152, output: -0.917, loss: 0.055  
i: 637, target: -1.206, output: -1.460, loss: 0.064  
i: 638, target: -0.990, output: -1.307, loss: 0.101  
i: 639, target: -2.931, output: -1.852, loss: 1.163  
i: 640, target: -1.904, output: -1.473, loss: 0.186  
i: 641, target: 9.690, output: 9.362, loss: 0.107  
i: 642, target: -1.288, output: -0.933, loss: 0.126  
i: 643, target: -1.601, output: -1.171, loss: 0.185  
i: 644, target: -0.859, output: -1.126, loss: 0.071  
i: 645, target: -0.438, output: -0.902, loss: 0.216  
i: 646, target: -0.669, output: -0.900, loss: 0.054  
i: 647, target: -0.465, output: -0.926, loss: 0.213  
i: 648, target: -0.895, output: -0.754, loss: 0.020  
i: 649, target: -1.213, output: -1.505, loss: 0.086  
i: 650, target: -1.517, output: -0.956, loss: 0.315  
i: 651, target: -1.919, output: -1.357, loss: 0.315  
i: 652, target: -0.545, output: -0.619, loss: 0.006  
i: 653, target: -0.410, output: -1.325, loss: 0.836

i: 654, target: -0.771, output: -0.977, loss: 0.042  
i: 655, target: -1.538, output: -1.152, loss: 0.149  
i: 656, target: -0.634, output: -1.196, loss: 0.315  
i: 657, target: -0.430, output: -0.734, loss: 0.092  
i: 658, target: -0.356, output: -0.922, loss: 0.320  
i: 659, target: -0.683, output: -0.901, loss: 0.048  
i: 660, target: -1.387, output: -0.857, loss: 0.281  
i: 661, target: -1.611, output: -1.275, loss: 0.113  
i: 662, target: -0.459, output: -0.875, loss: 0.173  
i: 663, target: 0.253, output: 0.001, loss: 0.063  
i: 664, target: -2.440, output: -1.632, loss: 0.653  
i: 665, target: -1.090, output: -1.330, loss: 0.058  
i: 666, target: -1.004, output: -0.904, loss: 0.010  
i: 667, target: -0.366, output: -0.887, loss: 0.272  
i: 668, target: -0.916, output: -0.822, loss: 0.009  
i: 669, target: -1.257, output: -1.503, loss: 0.060  
i: 670, target: -0.161, output: 0.088, loss: 0.062  
i: 671, target: -2.181, output: -1.548, loss: 0.401  
i: 672, target: -1.148, output: -1.227, loss: 0.006  
i: 673, target: -0.875, output: -1.168, loss: 0.086  
i: 674, target: 9.993, output: 9.183, loss: 0.656  
i: 675, target: -0.982, output: -1.374, loss: 0.154  
i: 676, target: -0.663, output: -1.067, loss: 0.164  
i: 677, target: -0.537, output: -0.720, loss: 0.034

i: 678, target: -1.561, output: -1.205, loss: 0.127  
i: 679, target: -0.485, output: -0.834, loss: 0.122  
i: 680, target: -0.521, output: -0.719, loss: 0.039  
i: 681, target: -2.740, output: -1.373, loss: 1.868  
i: 682, target: -1.267, output: -1.092, loss: 0.031  
i: 683, target: -2.291, output: -0.829, loss: 2.135  
i: 684, target: -1.383, output: -1.490, loss: 0.011  
i: 685, target: -1.199, output: -0.842, loss: 0.127  
i: 686, target: -2.131, output: -1.407, loss: 0.524  
i: 687, target: -1.934, output: -1.588, loss: 0.120  
i: 688, target: -0.481, output: -0.795, loss: 0.099  
i: 689, target: -1.999, output: -1.048, loss: 0.904  
i: 690, target: -1.687, output: -1.441, loss: 0.061  
i: 691, target: -1.271, output: -1.491, loss: 0.049  
i: 692, target: -0.731, output: -0.906, loss: 0.031  
i: 693, target: 9.817, output: 9.470, loss: 0.120  
i: 694, target: -0.589, output: -0.762, loss: 0.030  
i: 695, target: -0.524, output: -1.172, loss: 0.420  
i: 696, target: 9.607, output: 9.424, loss: 0.033  
i: 697, target: -0.498, output: -1.142, loss: 0.414  
i: 698, target: -0.709, output: -1.048, loss: 0.115  
i: 699, target: -0.739, output: -0.740, loss: 0.000  
i: 700, target: -1.307, output: -1.215, loss: 0.008  
i: 701, target: -0.460, output: -0.057, loss: 0.162

i: 702, target: -1.519, output: -0.840, loss: 0.462  
i: 703, target: -2.157, output: -1.616, loss: 0.293  
i: 704, target: -0.871, output: -0.939, loss: 0.005  
i: 705, target: -0.539, output: -0.949, loss: 0.167  
i: 706, target: -1.230, output: -0.720, loss: 0.260  
i: 707, target: -0.496, output: -0.716, loss: 0.049  
i: 708, target: -0.450, output: -0.903, loss: 0.205  
i: 709, target: -0.540, output: -0.883, loss: 0.118  
i: 710, target: -1.336, output: -0.798, loss: 0.289  
i: 711, target: -0.521, output: -0.760, loss: 0.057  
i: 712, target: -0.788, output: -1.122, loss: 0.112  
i: 713, target: -1.130, output: -0.996, loss: 0.018  
i: 714, target: -1.655, output: -1.147, loss: 0.258  
i: 715, target: -1.137, output: -1.226, loss: 0.008  
i: 716, target: -0.592, output: -0.870, loss: 0.077  
i: 717, target: -1.519, output: -1.250, loss: 0.072  
i: 718, target: -0.649, output: -0.743, loss: 0.009  
i: 719, target: 9.709, output: 9.512, loss: 0.039  
i: 720, target: -0.599, output: -0.807, loss: 0.043  
i: 721, target: 7.896, output: 9.234, loss: 1.789  
i: 722, target: -0.617, output: -0.824, loss: 0.043  
i: 723, target: -0.933, output: -0.755, loss: 0.032  
i: 724, target: -1.167, output: -1.546, loss: 0.144  
i: 725, target: -1.400, output: -1.260, loss: 0.019



i: 726, target: -1.097, output: -1.457, loss: 0.129  
i: 727, target: -1.626, output: -1.776, loss: 0.022  
i: 728, target: -1.427, output: -1.438, loss: 0.000  
i: 729, target: -0.416, output: -0.728, loss: 0.097  
i: 730, target: -0.623, output: -0.632, loss: 0.000  
i: 731, target: 0.371, output: 0.151, loss: 0.049  
i: 732, target: -1.196, output: -1.074, loss: 0.015  
i: 733, target: -0.687, output: -0.976, loss: 0.084  
i: 734, target: -0.508, output: -0.791, loss: 0.080  
i: 735, target: -0.168, output: -1.016, loss: 0.720  
i: 736, target: -2.304, output: -1.753, loss: 0.304  
i: 737, target: -1.236, output: -1.348, loss: 0.013  
i: 738, target: -2.203, output: -0.918, loss: 1.650  
i: 739, target: -1.246, output: -1.506, loss: 0.068  
i: 740, target: -1.292, output: -0.844, loss: 0.201  
i: 741, target: -0.782, output: -0.748, loss: 0.001  
i: 742, target: -1.198, output: -1.052, loss: 0.021  
i: 743, target: 0.421, output: 0.288, loss: 0.018  
i: 744, target: -1.200, output: -0.907, loss: 0.086  
i: 745, target: -0.739, output: -1.252, loss: 0.263  
i: 746, target: -1.192, output: -1.018, loss: 0.030  
i: 747, target: -0.132, output: 0.306, loss: 0.192  
i: 748, target: -1.310, output: -0.790, loss: 0.270  
i: 749, target: -1.848, output: -1.633, loss: 0.046

i: 750, target: -1.660, output: -1.607, loss: 0.003  
i: 751, target: 0.867, output: 0.244, loss: 0.388  
i: 752, target: -0.347, output: -0.826, loss: 0.230  
i: 753, target: -1.317, output: -1.280, loss: 0.001  
i: 754, target: -0.905, output: -1.290, loss: 0.148  
i: 755, target: -0.789, output: -1.051, loss: 0.069  
i: 756, target: -0.913, output: -1.370, loss: 0.209  
i: 757, target: -1.683, output: -1.261, loss: 0.178  
i: 758, target: -0.643, output: -0.775, loss: 0.017  
i: 759, target: -0.730, output: -1.063, loss: 0.110  
i: 760, target: -0.549, output: -0.884, loss: 0.112  
i: 761, target: -0.965, output: -0.905, loss: 0.004  
i: 762, target: -1.432, output: -0.917, loss: 0.265  
i: 763, target: -1.308, output: -0.763, loss: 0.297  
i: 764, target: -1.489, output: -1.276, loss: 0.045  
i: 765, target: -1.969, output: -1.759, loss: 0.044  
i: 766, target: -0.620, output: -0.840, loss: 0.049  
i: 767, target: -1.980, output: -1.221, loss: 0.577  
i: 768, target: -0.521, output: -0.865, loss: 0.118  
i: 769, target: -0.964, output: -0.902, loss: 0.004  
i: 770, target: 0.948, output: 0.272, loss: 0.457  
i: 771, target: -2.047, output: -1.427, loss: 0.384  
i: 772, target: -0.973, output: -1.165, loss: 0.037  
i: 773, target: -0.646, output: -1.273, loss: 0.393

i: 774, target: -2.619, output: -1.399, loss: 1.489  
i: 775, target: -0.902, output: -1.309, loss: 0.166  
i: 776, target: -0.539, output: -0.752, loss: 0.045  
i: 777, target: -1.300, output: -1.401, loss: 0.010  
i: 778, target: -0.860, output: -0.914, loss: 0.003  
i: 779, target: 0.366, output: 0.103, loss: 0.069  
i: 780, target: -0.744, output: -0.642, loss: 0.011  
i: 781, target: -1.288, output: -0.764, loss: 0.275  
i: 782, target: -0.853, output: -1.056, loss: 0.041  
i: 783, target: -1.539, output: -0.879, loss: 0.435  
i: 784, target: -1.313, output: -0.930, loss: 0.146  
i: 785, target: -1.083, output: -1.186, loss: 0.011  
i: 786, target: -1.480, output: -0.943, loss: 0.287  
i: 787, target: -0.735, output: -1.050, loss: 0.099  
i: 788, target: -0.754, output: -1.183, loss: 0.185  
i: 789, target: -1.189, output: -1.315, loss: 0.016  
i: 790, target: -0.954, output: -0.735, loss: 0.048  
i: 791, target: -1.347, output: -1.707, loss: 0.130  
i: 792, target: -0.262, output: -0.991, loss: 0.532  
i: 793, target: -0.602, output: -0.856, loss: 0.064  
i: 794, target: 8.904, output: 9.023, loss: 0.014  
i: 795, target: -2.232, output: -1.455, loss: 0.603  
i: 796, target: -0.861, output: -0.909, loss: 0.002  
i: 797, target: -0.538, output: -1.324, loss: 0.617

i: 798, target: -0.456, output: -1.086, loss: 0.397  
i: 799, target: -0.952, output: -1.321, loss: 0.136  
i: 800, target: -1.335, output: -1.217, loss: 0.014  
i: 801, target: -0.753, output: -0.785, loss: 0.001  
i: 802, target: -0.718, output: -1.222, loss: 0.255  
i: 803, target: -0.598, output: -0.874, loss: 0.077  
i: 804, target: -0.463, output: -1.553, loss: 1.188  
i: 805, target: -1.411, output: -1.037, loss: 0.140  
i: 806, target: -1.526, output: -0.872, loss: 0.428  
i: 807, target: -0.689, output: -1.162, loss: 0.224  
i: 808, target: -0.375, output: -1.260, loss: 0.784  
i: 809, target: -0.941, output: -0.787, loss: 0.024  
i: 810, target: -0.818, output: -0.994, loss: 0.031  
i: 811, target: -1.271, output: -1.012, loss: 0.067  
i: 812, target: -1.587, output: -1.146, loss: 0.194  
i: 813, target: -1.360, output: -1.088, loss: 0.074  
i: 814, target: -1.092, output: -0.986, loss: 0.011  
i: 815, target: -1.067, output: -0.968, loss: 0.010  
i: 816, target: -1.455, output: -1.581, loss: 0.016  
i: 817, target: -0.696, output: -1.364, loss: 0.447  
i: 818, target: -0.689, output: -0.721, loss: 0.001  
i: 819, target: -1.653, output: -1.309, loss: 0.118  
i: 820, target: -0.528, output: -0.859, loss: 0.110  
i: 821, target: -0.407, output: -0.678, loss: 0.073

i: 822, target: -1.310, output: -0.716, loss: 0.352  
i: 823, target: -0.603, output: -0.885, loss: 0.080  
i: 824, target: -0.265, output: -1.201, loss: 0.876  
i: 825, target: -1.600, output: -1.537, loss: 0.004  
i: 826, target: -0.064, output: -1.199, loss: 1.290  
i: 827, target: -1.005, output: -1.137, loss: 0.017  
i: 828, target: 0.467, output: 0.122, loss: 0.119  
i: 829, target: -1.026, output: -0.839, loss: 0.035  
i: 830, target: -1.144, output: -0.892, loss: 0.063  
i: 831, target: -0.910, output: -1.155, loss: 0.060  
i: 832, target: -0.607, output: -1.056, loss: 0.202  
i: 833, target: -1.967, output: -1.553, loss: 0.171  
i: 834, target: -1.645, output: -1.203, loss: 0.196  
i: 835, target: 0.763, output: 0.207, loss: 0.309  
i: 836, target: -0.773, output: -1.258, loss: 0.235  
i: 837, target: -1.200, output: -1.654, loss: 0.206  
i: 838, target: -1.101, output: -1.164, loss: 0.004  
i: 839, target: -0.625, output: -0.802, loss: 0.031  
i: 840, target: -0.956, output: -1.110, loss: 0.024  
i: 841, target: -0.512, output: -0.847, loss: 0.112  
i: 842, target: -0.712, output: -0.748, loss: 0.001  
i: 843, target: -0.565, output: -0.626, loss: 0.004  
i: 844, target: -0.662, output: -1.029, loss: 0.134  
i: 845, target: -0.835, output: -0.978, loss: 0.021

i: 846, target: 0.742, output: -0.052, loss: 0.629  
i: 847, target: -1.176, output: -0.977, loss: 0.039  
i: 848, target: -1.377, output: -1.509, loss: 0.017  
i: 849, target: 0.379, output: 0.106, loss: 0.075  
i: 850, target: -1.480, output: -1.485, loss: 0.000  
i: 851, target: -0.813, output: -0.768, loss: 0.002  
i: 852, target: -1.438, output: -0.874, loss: 0.318  
i: 853, target: -0.858, output: -0.962, loss: 0.011  
i: 854, target: -1.257, output: -0.784, loss: 0.224  
i: 855, target: -1.331, output: -0.799, loss: 0.283  
i: 856, target: -1.526, output: -0.863, loss: 0.440  
i: 857, target: 0.001, output: 0.217, loss: 0.046  
i: 858, target: -1.254, output: -0.994, loss: 0.067  
i: 859, target: 0.697, output: 0.278, loss: 0.175  
i: 860, target: -0.616, output: -0.914, loss: 0.089  
i: 861, target: -1.626, output: -1.060, loss: 0.320  
i: 862, target: -1.087, output: -0.789, loss: 0.089  
i: 863, target: -0.436, output: -0.939, loss: 0.253  
i: 864, target: -2.082, output: -1.707, loss: 0.141  
i: 865, target: -0.348, output: -0.658, loss: 0.096  
i: 866, target: -2.503, output: -1.353, loss: 1.322  
i: 867, target: -0.928, output: -1.096, loss: 0.028  
i: 868, target: -1.351, output: -1.356, loss: 0.000  
i: 869, target: -0.956, output: -0.762, loss: 0.038

i: 870, target: -0.897, output: -1.139, loss: 0.059  
i: 871, target: -2.039, output: -1.016, loss: 1.047  
i: 872, target: -0.462, output: -0.711, loss: 0.062  
i: 873, target: -1.342, output: -1.521, loss: 0.032  
i: 874, target: -1.784, output: -1.198, loss: 0.343  
i: 875, target: -0.459, output: -0.687, loss: 0.052  
i: 876, target: -1.197, output: -0.995, loss: 0.041  
i: 877, target: -1.947, output: -1.472, loss: 0.226  
i: 878, target: -0.674, output: -1.167, loss: 0.244  
i: 879, target: -0.731, output: -1.339, loss: 0.369  
i: 880, target: -0.786, output: -0.871, loss: 0.007  
i: 881, target: -1.504, output: -0.857, loss: 0.418  
i: 882, target: -1.153, output: -1.254, loss: 0.010  
i: 883, target: 0.570, output: 0.060, loss: 0.260  
i: 884, target: -0.363, output: -0.735, loss: 0.138  
i: 885, target: -1.394, output: -0.955, loss: 0.193  
i: 886, target: -1.108, output: -1.223, loss: 0.013  
i: 887, target: -1.309, output: -1.010, loss: 0.089  
i: 888, target: 9.022, output: 9.474, loss: 0.204  
i: 889, target: -0.789, output: -1.019, loss: 0.053  
i: 890, target: -0.607, output: -0.755, loss: 0.022  
i: 891, target: -0.749, output: -1.239, loss: 0.240  
i: 892, target: 9.188, output: 9.022, loss: 0.028  
i: 893, target: -1.988, output: -1.132, loss: 0.733

i: 894, target: -0.531, output: -0.756, loss: 0.050  
i: 895, target: -2.032, output: -1.067, loss: 0.931  
i: 896, target: -1.758, output: -1.607, loss: 0.023  
i: 897, target: -0.854, output: -1.059, loss: 0.042  
i: 898, target: -1.166, output: -1.299, loss: 0.018  
i: 899, target: -0.509, output: -0.919, loss: 0.168  
i: 900, target: -1.552, output: -1.400, loss: 0.023  
i: 901, target: -0.573, output: -0.667, loss: 0.009  
i: 902, target: -1.120, output: -1.589, loss: 0.220  
i: 903, target: -0.439, output: -0.969, loss: 0.281  
i: 904, target: 0.024, output: -0.143, loss: 0.028  
i: 905, target: -1.974, output: -1.130, loss: 0.713  
i: 906, target: -0.562, output: -1.064, loss: 0.252  
i: 907, target: 0.051, output: 0.289, loss: 0.057  
i: 908, target: -1.057, output: -0.975, loss: 0.007  
i: 909, target: -0.700, output: -1.087, loss: 0.150  
i: 910, target: -2.779, output: -1.086, loss: 2.869  
i: 911, target: -1.512, output: -1.085, loss: 0.182  
i: 912, target: -1.586, output: -1.549, loss: 0.001  
i: 913, target: 0.032, output: 0.203, loss: 0.029  
i: 914, target: -1.781, output: -1.323, loss: 0.210  
i: 915, target: -1.044, output: -1.319, loss: 0.075  
i: 916, target: -0.567, output: -1.151, loss: 0.341  
i: 917, target: -1.085, output: -1.124, loss: 0.002



i: 918, target: -0.914, output: -0.796, loss: 0.014  
i: 919, target: -1.289, output: -1.094, loss: 0.038  
i: 920, target: -1.252, output: -0.928, loss: 0.105  
i: 921, target: -0.701, output: -1.223, loss: 0.273  
i: 922, target: -1.781, output: -1.493, loss: 0.082  
i: 923, target: 9.686, output: 9.483, loss: 0.041  
i: 924, target: -0.937, output: -1.294, loss: 0.128  
i: 925, target: -0.038, output: -1.016, loss: 0.955  
i: 926, target: -0.724, output: -0.757, loss: 0.001  
i: 927, target: -0.879, output: -0.712, loss: 0.028  
i: 928, target: -0.658, output: -0.938, loss: 0.079  
i: 929, target: -1.231, output: -1.433, loss: 0.041  
i: 930, target: -1.385, output: -1.400, loss: 0.000  
i: 931, target: -0.857, output: -0.817, loss: 0.002  
i: 932, target: -0.587, output: -0.926, loss: 0.115  
i: 933, target: -1.761, output: -1.549, loss: 0.045  
i: 934, target: -1.223, output: -1.336, loss: 0.013  
i: 935, target: -1.244, output: -1.113, loss: 0.017  
i: 936, target: -1.287, output: -1.027, loss: 0.068  
i: 937, target: -1.525, output: -1.211, loss: 0.099  
i: 938, target: -0.458, output: -1.284, loss: 0.683  
i: 939, target: -1.066, output: -1.007, loss: 0.004  
i: 940, target: -1.914, output: -1.414, loss: 0.251  
i: 941, target: -0.546, output: -1.306, loss: 0.578

i: 942, target: -0.868, output: -1.056, loss: 0.035  
i: 943, target: -1.405, output: -1.160, loss: 0.060  
i: 944, target: 9.584, output: 9.483, loss: 0.010  
i: 945, target: -1.947, output: -1.147, loss: 0.640  
i: 946, target: -2.121, output: -1.295, loss: 0.682  
i: 947, target: -0.990, output: -0.628, loss: 0.131  
i: 948, target: -1.767, output: -1.485, loss: 0.080  
i: 949, target: -0.095, output: 0.227, loss: 0.103  
i: 950, target: -1.642, output: -1.267, loss: 0.141  
i: 951, target: 9.154, output: 9.414, loss: 0.068  
i: 952, target: -0.725, output: -1.401, loss: 0.457  
i: 953, target: -0.574, output: -0.773, loss: 0.040  
i: 954, target: -0.715, output: -1.130, loss: 0.172  
i: 955, target: -0.485, output: -1.035, loss: 0.303  
i: 956, target: -0.636, output: -1.173, loss: 0.289  
i: 957, target: -2.318, output: -0.923, loss: 1.945  
i: 958, target: -0.891, output: -1.188, loss: 0.088  
i: 959, target: -0.628, output: -1.216, loss: 0.346  
i: 960, target: -0.645, output: -0.747, loss: 0.010  
i: 961, target: 0.506, output: 0.249, loss: 0.066  
i: 962, target: -1.211, output: -0.940, loss: 0.073  
i: 963, target: -0.994, output: -1.145, loss: 0.023  
i: 964, target: -0.775, output: -1.042, loss: 0.071  
i: 965, target: -0.660, output: -0.535, loss: 0.016

i: 966, target: -1.674, output: -0.803, loss: 0.759  
i: 967, target: -0.742, output: -1.384, loss: 0.412  
i: 968, target: -0.580, output: -0.903, loss: 0.104  
i: 969, target: -1.049, output: -1.118, loss: 0.005  
i: 970, target: -1.120, output: -1.257, loss: 0.019  
i: 971, target: -1.997, output: -1.025, loss: 0.945  
i: 972, target: -0.640, output: -0.826, loss: 0.034  
i: 973, target: -1.754, output: -1.026, loss: 0.529  
i: 974, target: -1.406, output: -0.932, loss: 0.225  
i: 975, target: -1.222, output: -1.447, loss: 0.051  
i: 976, target: -0.434, output: -0.850, loss: 0.173  
i: 977, target: 9.467, output: 9.151, loss: 0.099  
i: 978, target: -0.706, output: -0.736, loss: 0.001  
i: 979, target: -0.218, output: -1.387, loss: 1.367  
i: 980, target: -1.364, output: -0.839, loss: 0.277  
i: 981, target: -1.735, output: -1.524, loss: 0.045  
i: 982, target: -0.813, output: -0.992, loss: 0.032  
i: 983, target: -1.351, output: -1.041, loss: 0.096  
i: 984, target: -0.784, output: -1.366, loss: 0.339  
i: 985, target: -1.188, output: -0.713, loss: 0.225  
i: 986, target: -1.352, output: -1.228, loss: 0.016  
i: 987, target: 0.519, output: 0.037, loss: 0.232  
i: 988, target: -2.826, output: -0.953, loss: 3.510  
i: 989, target: -0.614, output: -1.087, loss: 0.223

```

i: 990, target: -1.521, output: -1.850, loss: 0.108
i: 991, target: -0.743, output: -0.962, loss: 0.048
i: 992, target: -0.318, output: -1.143, loss: 0.681
i: 993, target: 9.586, output: 9.564, loss: 0.001
i: 994, target: -0.637, output: -1.141, loss: 0.255
i: 995, target: -1.179, output: -1.448, loss: 0.072
i: 996, target: -0.941, output: -0.852, loss: 0.008
i: 997, target: -0.624, output: -1.256, loss: 0.400
i: 998, target: -0.240, output: -1.118, loss: 0.771
i: 999, target: -1.023, output: -0.767, loss: 0.065

Average loss: 0.196

```

### 3 Save the Notebook as a PDF

```

[15]: import subprocess
import os

name_notebook = "0724-small_classical_model.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])

```

```

[15]: CompletedProcess(args=['jupyter', 'nbconvert', '--to', 'pdf', '--output',
'results/0724/0724-small_classical_model_0.pdf',
'0724-small_classical_model.ipynb'], returncode=0)

```

[ ]: