top5_0.001_100

April 17, 2025

```python
from tqdm import tqdm
import torch
import torch.nn as nn
import torch.optim as optim
from sklearn.metrics import accuracy_score, classification_report
import pandas as pd
from social_lstm_classifier import SocialLSTMClassifier

trajectory_features = ['Positionx', 'Positiony', 'Distance', 'Speed', 'Speed
 Change', 'Direction', 'Direction Change']

feature_combos = {
    # 'xy_2': ['Positionx', 'Positiony'],
    'xyd_3': ['Positionx', 'Positiony', 'Distance'],
    # 'xydsdc_7': ['Positionx', 'Positiony', 'Distance', 'Speed', 'Direction',
 'Speed Change', 'Direction Change'],
    'xysd_4': ['Positionx', 'Positiony', 'Speed', 'Direction'],
    # 'xyds_4': ['Positionx', 'Positiony', 'Distance', 'Speed'],
    'xydd_4': ['Positionx', 'Positiony', 'Distance', 'Direction'],
    'xydsc_5': ['Positionx', 'Positiony', 'Distance', 'Speed', 'Speed Change'],
    # 'xyddc_5': ['Positionx', 'Positiony', 'Distance', 'Direction', 'Direction
 Change'],
    # 'xys_3': ['Positionx', 'Positiony', 'Speed'],
    'xydi_3': ['Positionx', 'Positiony', 'Direction'],
    # 'xysc_4': ['Positionx', 'Positiony', 'Speed', 'Speed Change'],
    # 'xydc_4': ['Positionx', 'Positiony', 'Direction', 'Direction Change']
}

train_data = torch.load("./train_social_lstm_full.pt")
test_data = torch.load("./test_social_lstm_full.pt")

results = []

def run_experiment(feature_set, name):
    input_size = len(feature_set)
    index_map = [trajectory_features.index(f) for f in feature_set]
```

```python
    model = SocialLSTMClassifier(input_size=input_size)
    criterion = nn.CrossEntropyLoss()
    optimizer = optim.Adam(model.parameters(), lr=0.001)
    epochs = 100

    model.train()
    for epoch in range(epochs):
        total_loss = 0.0
        for sample in tqdm(train_data, desc=f"Epoch {epoch+1}/{epochs}"):
            # traj = sample['trajectory'][:, index_map].unsqueeze(1)
            # neighbors = sample['neighbors'][:, :, index_map]
            traj = sample['trajectory'][:, index_map]   # [T, 1, D]
            neighbors = [frame[:, index_map] for frame in sample['neighbors']] ⊔
↪# list[T][N_i, D]

            mask = sample['neighbor_mask']
            label = torch.tensor([int(sample['cluster']) - 1], dtype=torch.long)

            optimizer.zero_grad()
            logits = model(traj, neighbors, mask)
            loss = criterion(logits, label)
            loss.backward()
            optimizer.step()

            total_loss += loss.item()

        avg_loss = total_loss / len(train_data)
        print(f"\n[Feature Set: {name}] Epoch [{epoch+1}/{epochs}] - Avg Loss:⊔
↪{avg_loss:.4f}")


    # model.eval()
    # y_true = []
    # y_pred = []
    # with torch.no_grad():
    #     for sample in tqdm(train_data, desc=f"Epoch {epoch+1}/{epochs}"):
    #         # traj = sample['trajectory'][:, index_map].unsqueeze(1)
    #         # neighbors = sample['neighbors'][:, :, index_map]
    #         traj = sample['trajectory'][:, index_map] # [T, 1, D]
    #         neighbors = [frame[:, index_map] for frame in⊔
↪sample['neighbors']]  # list[T][N_i, D]
    #         mask = sample['neighbor_mask']
    #         label = int(sample['cluster']) - 1
    #         logits = model(traj, neighbors, mask)
    #         pred = logits.argmax(dim=1).item()
    #         y_true.append(label)
    #         y_pred.append(pred)
```

```python
    model.eval()
    y_true = []
    y_pred = []
    with torch.no_grad():
        for sample in tqdm(test_data, desc=f"[Eval] {name}"):
            traj = sample['trajectory'][:, index_map]
            neighbors = [frame[:, index_map] for frame in sample['neighbors']]
            mask = sample['neighbor_mask']
            label = int(sample['cluster']) - 1
            logits = model(traj, neighbors, mask)
            pred = logits.argmax(dim=1).item()
            y_true.append(label)
            y_pred.append(pred)


    acc = accuracy_score(y_true, y_pred)
    clf_report = classification_report(y_true, y_pred, output_dict=True)
    results.append({
        "Feature_Set": name,
        "Accuracy": acc,
        "Macro_F1": clf_report['macro avg']['f1-score'],
        "Weighted_F1": clf_report['weighted avg']['f1-score']
    })

for name, feats in feature_combos.items():
    run_experiment(feats, name)
```

/var/folders/nt/7f1y5h8s6qd2mh1ypgjkgbpw0000gn/T/ipykernel_72196/1565034385.py:2
6: FutureWarning: You are using `torch.load` with `weights_only=False` (the
current default value), which uses the default pickle module implicitly. It is
possible to construct malicious pickle data which will execute arbitrary code
during unpickling (See
https://github.com/pytorch/pytorch/blob/main/SECURITY.md#untrusted-models for
more details). In a future release, the default value for `weights_only` will be
flipped to `True`. This limits the functions that could be executed during
unpickling. Arbitrary objects will no longer be allowed to be loaded via this
mode unless they are explicitly allowlisted by the user via
`torch.serialization.add_safe_globals`. We recommend you start setting
`weights_only=True` for any use case where you don't have full control of the
loaded file. Please open an issue on GitHub for any issues related to this
experimental feature.
  train_data = torch.load("./train_social_lstm_full.pt")
/var/folders/nt/7f1y5h8s6qd2mh1ypgjkgbpw0000gn/T/ipykernel_72196/1565034385.py:2
7: FutureWarning: You are using `torch.load` with `weights_only=False` (the
current default value), which uses the default pickle module implicitly. It is
possible to construct malicious pickle data which will execute arbitrary code
during unpickling (See

https://github.com/pytorch/pytorch/blob/main/SECURITY.md#untrusted-models for more details). In a future release, the default value for `weights_only` will be flipped to `True`. This limits the functions that could be executed during unpickling. Arbitrary objects will no longer be allowed to be loaded via this mode unless they are explicitly allowlisted by the user via `torch.serialization.add_safe_globals`. We recommend you start setting `weights_only=True` for any use case where you don't have full control of the loaded file. Please open an issue on GitHub for any issues related to this experimental feature.
  test_data = torch.load("./test_social_lstm_full.pt")
Epoch 1/100: 100%| | 570/570 [00:03<00:00, 172.44it/s]

[Feature Set: xyd_3] Epoch [1/100] - Avg Loss: 0.6786

Epoch 2/100: 100%| | 570/570 [00:03<00:00, 176.74it/s]

[Feature Set: xyd_3] Epoch [2/100] - Avg Loss: 0.6676

Epoch 3/100: 100%| | 570/570 [00:03<00:00, 173.64it/s]

[Feature Set: xyd_3] Epoch [3/100] - Avg Loss: 0.6608

Epoch 4/100: 100%| | 570/570 [00:03<00:00, 168.31it/s]

[Feature Set: xyd_3] Epoch [4/100] - Avg Loss: 0.6560

Epoch 5/100: 100%| | 570/570 [00:04<00:00, 129.32it/s]

[Feature Set: xyd_3] Epoch [5/100] - Avg Loss: 0.6479

Epoch 6/100: 100%| | 570/570 [00:03<00:00, 176.95it/s]

[Feature Set: xyd_3] Epoch [6/100] - Avg Loss: 0.6385

Epoch 7/100: 100%| | 570/570 [00:03<00:00, 179.07it/s]

[Feature Set: xyd_3] Epoch [7/100] - Avg Loss: 0.6274

Epoch 8/100: 100%| | 570/570 [00:03<00:00, 180.84it/s]

[Feature Set: xyd_3] Epoch [8/100] - Avg Loss: 0.6179

Epoch 9/100: 100%| | 570/570 [00:03<00:00, 179.40it/s]

[Feature Set: xyd_3] Epoch [9/100] - Avg Loss: 0.6150

Epoch 10/100: 100%| | 570/570 [00:03<00:00, 179.25it/s]

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[Feature Set: xyd_3] Epoch [10/100] - Avg Loss: 0.6018
Epoch 11/100: 100%|      | 570/570 [00:03<00:00, 180.44it/s]

[Feature Set: xyd_3] Epoch [11/100] - Avg Loss: 0.5927
Epoch 12/100: 100%|      | 570/570 [00:03<00:00, 178.76it/s]

[Feature Set: xyd_3] Epoch [12/100] - Avg Loss: 0.5804
Epoch 13/100: 100%|      | 570/570 [00:03<00:00, 178.50it/s]

[Feature Set: xyd_3] Epoch [13/100] - Avg Loss: 0.5713
Epoch 14/100: 100%|      | 570/570 [00:03<00:00, 173.58it/s]

[Feature Set: xyd_3] Epoch [14/100] - Avg Loss: 0.5585
Epoch 15/100: 100%|      | 570/570 [00:03<00:00, 175.45it/s]

[Feature Set: xyd_3] Epoch [15/100] - Avg Loss: 0.5456
Epoch 16/100: 100%|      | 570/570 [00:03<00:00, 177.22it/s]

[Feature Set: xyd_3] Epoch [16/100] - Avg Loss: 0.5351
Epoch 17/100: 100%|      | 570/570 [00:03<00:00, 179.04it/s]

[Feature Set: xyd_3] Epoch [17/100] - Avg Loss: 0.5376
Epoch 18/100: 100%|      | 570/570 [00:03<00:00, 177.42it/s]

[Feature Set: xyd_3] Epoch [18/100] - Avg Loss: 0.5165
Epoch 19/100: 100%|      | 570/570 [00:03<00:00, 180.79it/s]

[Feature Set: xyd_3] Epoch [19/100] - Avg Loss: 0.5012
Epoch 20/100: 100%|      | 570/570 [00:03<00:00, 178.48it/s]

[Feature Set: xyd_3] Epoch [20/100] - Avg Loss: 0.4959
Epoch 21/100: 100%|      | 570/570 [00:03<00:00, 176.25it/s]

[Feature Set: xyd_3] Epoch [21/100] - Avg Loss: 0.4844
Epoch 22/100: 100%|      | 570/570 [00:03<00:00, 177.53it/s]
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[Feature Set: xyd_3] Epoch [22/100] - Avg Loss: 0.4676
Epoch 23/100: 100%|        | 570/570 [00:03<00:00, 180.47it/s]

[Feature Set: xyd_3] Epoch [23/100] - Avg Loss: 0.4549
Epoch 24/100: 100%|        | 570/570 [00:03<00:00, 178.69it/s]

[Feature Set: xyd_3] Epoch [24/100] - Avg Loss: 0.4424
Epoch 25/100: 100%|        | 570/570 [00:03<00:00, 178.77it/s]

[Feature Set: xyd_3] Epoch [25/100] - Avg Loss: 0.4391
Epoch 26/100: 100%|        | 570/570 [00:03<00:00, 180.14it/s]

[Feature Set: xyd_3] Epoch [26/100] - Avg Loss: 0.4362
Epoch 27/100: 100%|        | 570/570 [00:03<00:00, 179.35it/s]

[Feature Set: xyd_3] Epoch [27/100] - Avg Loss: 0.4104
Epoch 28/100: 100%|        | 570/570 [00:03<00:00, 180.65it/s]

[Feature Set: xyd_3] Epoch [28/100] - Avg Loss: 0.4061
Epoch 29/100: 100%|        | 570/570 [00:03<00:00, 178.93it/s]

[Feature Set: xyd_3] Epoch [29/100] - Avg Loss: 0.3972
Epoch 30/100: 100%|        | 570/570 [00:03<00:00, 179.58it/s]

[Feature Set: xyd_3] Epoch [30/100] - Avg Loss: 0.3856
Epoch 31/100: 100%|        | 570/570 [00:03<00:00, 180.29it/s]

[Feature Set: xyd_3] Epoch [31/100] - Avg Loss: 0.3870
Epoch 32/100: 100%|        | 570/570 [00:03<00:00, 179.08it/s]

[Feature Set: xyd_3] Epoch [32/100] - Avg Loss: 0.4049
Epoch 33/100: 100%|        | 570/570 [00:03<00:00, 180.92it/s]

[Feature Set: xyd_3] Epoch [33/100] - Avg Loss: 0.3872
Epoch 34/100: 100%|        | 570/570 [00:03<00:00, 179.20it/s]
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[Feature Set: xyd_3] Epoch [34/100] - Avg Loss: 0.3593
Epoch 35/100: 100%|     | 570/570 [00:03<00:00, 179.16it/s]

[Feature Set: xyd_3] Epoch [35/100] - Avg Loss: 0.3723
Epoch 36/100: 100%|     | 570/570 [00:03<00:00, 179.37it/s]

[Feature Set: xyd_3] Epoch [36/100] - Avg Loss: 0.3632
Epoch 37/100: 100%|     | 570/570 [00:03<00:00, 178.21it/s]

[Feature Set: xyd_3] Epoch [37/100] - Avg Loss: 0.3636
Epoch 38/100: 100%|     | 570/570 [00:03<00:00, 178.50it/s]

[Feature Set: xyd_3] Epoch [38/100] - Avg Loss: 0.3535
Epoch 39/100: 100%|     | 570/570 [00:03<00:00, 180.15it/s]

[Feature Set: xyd_3] Epoch [39/100] - Avg Loss: 0.3406
Epoch 40/100: 100%|     | 570/570 [00:03<00:00, 179.17it/s]

[Feature Set: xyd_3] Epoch [40/100] - Avg Loss: 0.3480
Epoch 41/100: 100%|     | 570/570 [00:03<00:00, 180.12it/s]

[Feature Set: xyd_3] Epoch [41/100] - Avg Loss: 0.3270
Epoch 42/100: 100%|     | 570/570 [00:03<00:00, 178.92it/s]

[Feature Set: xyd_3] Epoch [42/100] - Avg Loss: 0.3247
Epoch 43/100: 100%|     | 570/570 [00:03<00:00, 179.55it/s]

[Feature Set: xyd_3] Epoch [43/100] - Avg Loss: 0.3224
Epoch 44/100: 100%|     | 570/570 [00:03<00:00, 179.49it/s]

[Feature Set: xyd_3] Epoch [44/100] - Avg Loss: 0.3320
Epoch 45/100: 100%|     | 570/570 [00:03<00:00, 179.26it/s]

[Feature Set: xyd_3] Epoch [45/100] - Avg Loss: 0.3237
Epoch 46/100: 100%|     | 570/570 [00:03<00:00, 178.58it/s]
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[Feature Set: xyd_3] Epoch [46/100] - Avg Loss: 0.3200

Epoch 47/100: 100%| | 570/570 [00:03<00:00, 178.85it/s]

[Feature Set: xyd_3] Epoch [47/100] - Avg Loss: 0.3244

Epoch 48/100: 100%| | 570/570 [00:03<00:00, 179.18it/s]

[Feature Set: xyd_3] Epoch [48/100] - Avg Loss: 0.3357

Epoch 49/100: 100%| | 570/570 [00:03<00:00, 179.96it/s]

[Feature Set: xyd_3] Epoch [49/100] - Avg Loss: 0.3209

Epoch 50/100: 100%| | 570/570 [00:03<00:00, 179.27it/s]

[Feature Set: xyd_3] Epoch [50/100] - Avg Loss: 0.3142

Epoch 51/100: 100%| | 570/570 [00:03<00:00, 179.17it/s]

[Feature Set: xyd_3] Epoch [51/100] - Avg Loss: 0.3041

Epoch 52/100: 100%| | 570/570 [00:03<00:00, 179.99it/s]

[Feature Set: xyd_3] Epoch [52/100] - Avg Loss: 0.3181

Epoch 53/100: 100%| | 570/570 [00:03<00:00, 179.17it/s]

[Feature Set: xyd_3] Epoch [53/100] - Avg Loss: 0.3088

Epoch 54/100: 100%| | 570/570 [00:03<00:00, 180.52it/s]

[Feature Set: xyd_3] Epoch [54/100] - Avg Loss: 0.2882

Epoch 55/100: 100%| | 570/570 [00:03<00:00, 178.98it/s]

[Feature Set: xyd_3] Epoch [55/100] - Avg Loss: 0.2802

Epoch 56/100: 100%| | 570/570 [00:03<00:00, 179.84it/s]

[Feature Set: xyd_3] Epoch [56/100] - Avg Loss: 0.2978

Epoch 57/100: 100%| | 570/570 [00:03<00:00, 178.45it/s]

[Feature Set: xyd_3] Epoch [57/100] - Avg Loss: 0.2996

Epoch 58/100: 100%| | 570/570 [00:03<00:00, 179.38it/s]

[Feature Set: xyd_3] Epoch [58/100] - Avg Loss: 0.2845
Epoch 59/100: 100%| | 570/570 [00:03<00:00, 180.48it/s]

[Feature Set: xyd_3] Epoch [59/100] - Avg Loss: 0.2840
Epoch 60/100: 100%| | 570/570 [00:03<00:00, 179.01it/s]

[Feature Set: xyd_3] Epoch [60/100] - Avg Loss: 0.2938
Epoch 61/100: 100%| | 570/570 [00:03<00:00, 178.60it/s]

[Feature Set: xyd_3] Epoch [61/100] - Avg Loss: 0.2749
Epoch 62/100: 100%| | 570/570 [00:03<00:00, 178.66it/s]

[Feature Set: xyd_3] Epoch [62/100] - Avg Loss: 0.2688
Epoch 63/100: 100%| | 570/570 [00:03<00:00, 178.31it/s]

[Feature Set: xyd_3] Epoch [63/100] - Avg Loss: 0.2460
Epoch 64/100: 100%| | 570/570 [00:03<00:00, 180.06it/s]

[Feature Set: xyd_3] Epoch [64/100] - Avg Loss: 0.2632
Epoch 65/100: 100%| | 570/570 [00:03<00:00, 178.81it/s]

[Feature Set: xyd_3] Epoch [65/100] - Avg Loss: 0.2637
Epoch 66/100: 100%| | 570/570 [00:03<00:00, 179.38it/s]

[Feature Set: xyd_3] Epoch [66/100] - Avg Loss: 0.2518
Epoch 67/100: 100%| | 570/570 [00:03<00:00, 179.56it/s]

[Feature Set: xyd_3] Epoch [67/100] - Avg Loss: 0.2494
Epoch 68/100: 100%| | 570/570 [00:03<00:00, 180.80it/s]

[Feature Set: xyd_3] Epoch [68/100] - Avg Loss: 0.2748
Epoch 69/100: 100%| | 570/570 [00:03<00:00, 179.18it/s]

[Feature Set: xyd_3] Epoch [69/100] - Avg Loss: 0.2418
Epoch 70/100: 100%| | 570/570 [00:03<00:00, 179.26it/s]

[Feature Set: xyd_3] Epoch [70/100] - Avg Loss: 0.2408

Epoch 71/100: 100%| | 570/570 [00:03<00:00, 180.22it/s]

[Feature Set: xyd_3] Epoch [71/100] - Avg Loss: 0.2632

Epoch 72/100: 100%| | 570/570 [00:03<00:00, 179.07it/s]

[Feature Set: xyd_3] Epoch [72/100] - Avg Loss: 0.2317

Epoch 73/100: 100%| | 570/570 [00:03<00:00, 178.40it/s]

[Feature Set: xyd_3] Epoch [73/100] - Avg Loss: 0.2526

Epoch 74/100: 100%| | 570/570 [00:03<00:00, 180.34it/s]

[Feature Set: xyd_3] Epoch [74/100] - Avg Loss: 0.2320

Epoch 75/100: 100%| | 570/570 [00:03<00:00, 178.92it/s]

[Feature Set: xyd_3] Epoch [75/100] - Avg Loss: 0.2487

Epoch 76/100: 100%| | 570/570 [00:03<00:00, 179.02it/s]

[Feature Set: xyd_3] Epoch [76/100] - Avg Loss: 0.2378

Epoch 77/100: 100%| | 570/570 [00:03<00:00, 179.99it/s]

[Feature Set: xyd_3] Epoch [77/100] - Avg Loss: 0.2343

Epoch 78/100: 100%| | 570/570 [00:03<00:00, 179.16it/s]

[Feature Set: xyd_3] Epoch [78/100] - Avg Loss: 0.2219

Epoch 79/100: 100%| | 570/570 [00:03<00:00, 178.41it/s]

[Feature Set: xyd_3] Epoch [79/100] - Avg Loss: 0.2429

Epoch 80/100: 100%| | 570/570 [00:03<00:00, 180.54it/s]

[Feature Set: xyd_3] Epoch [80/100] - Avg Loss: 0.2463

Epoch 81/100: 100%| | 570/570 [00:03<00:00, 178.75it/s]

[Feature Set: xyd_3] Epoch [81/100] - Avg Loss: 0.2108

Epoch 82/100: 100%| | 570/570 [00:03<00:00, 180.86it/s]

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[Feature Set: xyd_3] Epoch [82/100] - Avg Loss: 0.1872
Epoch 83/100: 100%|      | 570/570 [00:03<00:00, 178.77it/s]

[Feature Set: xyd_3] Epoch [83/100] - Avg Loss: 0.2296
Epoch 84/100: 100%|      | 570/570 [00:03<00:00, 179.27it/s]

[Feature Set: xyd_3] Epoch [84/100] - Avg Loss: 0.2043
Epoch 85/100: 100%|      | 570/570 [00:03<00:00, 178.68it/s]

[Feature Set: xyd_3] Epoch [85/100] - Avg Loss: 0.1999
Epoch 86/100: 100%|      | 570/570 [00:03<00:00, 178.65it/s]

[Feature Set: xyd_3] Epoch [86/100] - Avg Loss: 0.2139
Epoch 87/100: 100%|      | 570/570 [00:03<00:00, 178.91it/s]

[Feature Set: xyd_3] Epoch [87/100] - Avg Loss: 0.2023
Epoch 88/100: 100%|      | 570/570 [00:03<00:00, 180.38it/s]

[Feature Set: xyd_3] Epoch [88/100] - Avg Loss: 0.2350
Epoch 89/100: 100%|      | 570/570 [00:03<00:00, 179.20it/s]

[Feature Set: xyd_3] Epoch [89/100] - Avg Loss: 0.2140
Epoch 90/100: 100%|      | 570/570 [00:03<00:00, 178.66it/s]

[Feature Set: xyd_3] Epoch [90/100] - Avg Loss: 0.2103
Epoch 91/100: 100%|      | 570/570 [00:03<00:00, 180.48it/s]

[Feature Set: xyd_3] Epoch [91/100] - Avg Loss: 0.1934
Epoch 92/100: 100%|      | 570/570 [00:03<00:00, 178.91it/s]

[Feature Set: xyd_3] Epoch [92/100] - Avg Loss: 0.2048
Epoch 93/100: 100%|      | 570/570 [00:03<00:00, 180.27it/s]

[Feature Set: xyd_3] Epoch [93/100] - Avg Loss: 0.2235
Epoch 94/100: 100%|      | 570/570 [00:03<00:00, 178.56it/s]
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[Feature Set: xyd_3] Epoch [94/100] - Avg Loss: 0.1605
Epoch 95/100: 100%|       | 570/570 [00:03<00:00, 179.34it/s]


[Feature Set: xyd_3] Epoch [95/100] - Avg Loss: 0.1973
Epoch 96/100: 100%|       | 570/570 [00:03<00:00, 179.09it/s]


[Feature Set: xyd_3] Epoch [96/100] - Avg Loss: 0.2078
Epoch 97/100: 100%|       | 570/570 [00:03<00:00, 179.91it/s]


[Feature Set: xyd_3] Epoch [97/100] - Avg Loss: 0.2019
Epoch 98/100: 100%|       | 570/570 [00:03<00:00, 177.91it/s]


[Feature Set: xyd_3] Epoch [98/100] - Avg Loss: 0.1800
Epoch 99/100: 100%|       | 570/570 [00:03<00:00, 179.13it/s]


[Feature Set: xyd_3] Epoch [99/100] - Avg Loss: 0.1788
Epoch 100/100: 100%|       | 570/570 [00:03<00:00, 179.59it/s]


[Feature Set: xyd_3] Epoch [100/100] - Avg Loss: 0.2305
[Eval] xyd_3: 100%|       | 143/143 [00:00<00:00, 327.72it/s]
Epoch 1/100: 100%|       | 570/570 [00:03<00:00, 181.69it/s]


[Feature Set: xysd_4] Epoch [1/100] - Avg Loss: 0.6760
Epoch 2/100: 100%|       | 570/570 [00:03<00:00, 180.67it/s]


[Feature Set: xysd_4] Epoch [2/100] - Avg Loss: 0.6645
Epoch 3/100: 100%|       | 570/570 [00:03<00:00, 180.74it/s]


[Feature Set: xysd_4] Epoch [3/100] - Avg Loss: 0.6587
Epoch 4/100: 100%|       | 570/570 [00:03<00:00, 181.08it/s]


[Feature Set: xysd_4] Epoch [4/100] - Avg Loss: 0.6484
Epoch 5/100: 100%|       | 570/570 [00:03<00:00, 179.58it/s]


[Feature Set: xysd_4] Epoch [5/100] - Avg Loss: 0.6339
```

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Epoch 6/100: 100%|        | 570/570 [00:03<00:00, 182.24it/s]

[Feature Set: xysd_4] Epoch [6/100] - Avg Loss: 0.6120

Epoch 7/100: 100%|        | 570/570 [00:03<00:00, 181.16it/s]

[Feature Set: xysd_4] Epoch [7/100] - Avg Loss: 0.5840

Epoch 8/100: 100%|        | 570/570 [00:03<00:00, 181.30it/s]

[Feature Set: xysd_4] Epoch [8/100] - Avg Loss: 0.5540

Epoch 9/100: 100%|        | 570/570 [00:03<00:00, 181.86it/s]

[Feature Set: xysd_4] Epoch [9/100] - Avg Loss: 0.5277

Epoch 10/100: 100%|        | 570/570 [00:03<00:00, 177.02it/s]

[Feature Set: xysd_4] Epoch [10/100] - Avg Loss: 0.4987

Epoch 11/100: 100%|        | 570/570 [00:03<00:00, 180.09it/s]

[Feature Set: xysd_4] Epoch [11/100] - Avg Loss: 0.4623

Epoch 12/100: 100%|        | 570/570 [00:03<00:00, 181.07it/s]

[Feature Set: xysd_4] Epoch [12/100] - Avg Loss: 0.4341

Epoch 13/100: 100%|        | 570/570 [00:03<00:00, 179.56it/s]

[Feature Set: xysd_4] Epoch [13/100] - Avg Loss: 0.4015

Epoch 14/100: 100%|        | 570/570 [00:03<00:00, 180.31it/s]

[Feature Set: xysd_4] Epoch [14/100] - Avg Loss: 0.3728

Epoch 15/100: 100%|        | 570/570 [00:03<00:00, 180.82it/s]

[Feature Set: xysd_4] Epoch [15/100] - Avg Loss: 0.3380

Epoch 16/100: 100%|        | 570/570 [00:03<00:00, 182.07it/s]

[Feature Set: xysd_4] Epoch [16/100] - Avg Loss: 0.3298

Epoch 17/100: 100%|        | 570/570 [00:03<00:00, 180.53it/s]

[Feature Set: xysd_4] Epoch [17/100] - Avg Loss: 0.3112
```

```
Epoch 18/100: 100%|      | 570/570 [00:03<00:00, 180.50it/s]

[Feature Set: xysd_4] Epoch [18/100] - Avg Loss: 0.3138
Epoch 19/100: 100%|      | 570/570 [00:03<00:00, 182.18it/s]

[Feature Set: xysd_4] Epoch [19/100] - Avg Loss: 0.2743
Epoch 20/100: 100%|      | 570/570 [00:03<00:00, 180.35it/s]

[Feature Set: xysd_4] Epoch [20/100] - Avg Loss: 0.2591
Epoch 21/100: 100%|      | 570/570 [00:03<00:00, 180.19it/s]

[Feature Set: xysd_4] Epoch [21/100] - Avg Loss: 0.2679
Epoch 22/100: 100%|      | 570/570 [00:03<00:00, 181.66it/s]

[Feature Set: xysd_4] Epoch [22/100] - Avg Loss: 0.1964
Epoch 23/100: 100%|      | 570/570 [00:03<00:00, 180.05it/s]

[Feature Set: xysd_4] Epoch [23/100] - Avg Loss: 0.2307
Epoch 24/100: 100%|      | 570/570 [00:03<00:00, 181.64it/s]

[Feature Set: xysd_4] Epoch [24/100] - Avg Loss: 0.2673
Epoch 25/100: 100%|      | 570/570 [00:03<00:00, 180.20it/s]

[Feature Set: xysd_4] Epoch [25/100] - Avg Loss: 0.2466
Epoch 26/100: 100%|      | 570/570 [00:03<00:00, 181.41it/s]

[Feature Set: xysd_4] Epoch [26/100] - Avg Loss: 0.1967
Epoch 27/100: 100%|      | 570/570 [00:03<00:00, 180.58it/s]

[Feature Set: xysd_4] Epoch [27/100] - Avg Loss: 0.2470
Epoch 28/100: 100%|      | 570/570 [00:03<00:00, 180.68it/s]

[Feature Set: xysd_4] Epoch [28/100] - Avg Loss: 0.2051
Epoch 29/100: 100%|      | 570/570 [00:03<00:00, 180.18it/s]

[Feature Set: xysd_4] Epoch [29/100] - Avg Loss: 0.1674
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Epoch 30/100: 100%|        | 570/570 [00:03<00:00, 181.60it/s]

[Feature Set: xysd_4] Epoch [30/100] - Avg Loss: 0.2099
Epoch 31/100: 100%|        | 570/570 [00:03<00:00, 179.94it/s]

[Feature Set: xysd_4] Epoch [31/100] - Avg Loss: 0.1546
Epoch 32/100: 100%|        | 570/570 [00:03<00:00, 179.74it/s]

[Feature Set: xysd_4] Epoch [32/100] - Avg Loss: 0.1711
Epoch 33/100: 100%|        | 570/570 [00:03<00:00, 181.32it/s]

[Feature Set: xysd_4] Epoch [33/100] - Avg Loss: 0.1762
Epoch 34/100: 100%|        | 570/570 [00:03<00:00, 180.58it/s]

[Feature Set: xysd_4] Epoch [34/100] - Avg Loss: 0.1776
Epoch 35/100: 100%|        | 570/570 [00:03<00:00, 180.50it/s]

[Feature Set: xysd_4] Epoch [35/100] - Avg Loss: 0.1856
Epoch 36/100: 100%|        | 570/570 [00:03<00:00, 181.74it/s]

[Feature Set: xysd_4] Epoch [36/100] - Avg Loss: 0.1276
Epoch 37/100: 100%|        | 570/570 [00:03<00:00, 180.42it/s]

[Feature Set: xysd_4] Epoch [37/100] - Avg Loss: 0.1294
Epoch 38/100: 100%|        | 570/570 [00:03<00:00, 180.61it/s]

[Feature Set: xysd_4] Epoch [38/100] - Avg Loss: 0.1210
Epoch 39/100: 100%|        | 570/570 [00:03<00:00, 181.99it/s]

[Feature Set: xysd_4] Epoch [39/100] - Avg Loss: 0.1458
Epoch 40/100: 100%|        | 570/570 [00:03<00:00, 180.12it/s]

[Feature Set: xysd_4] Epoch [40/100] - Avg Loss: 0.1647
Epoch 41/100: 100%|        | 570/570 [00:03<00:00, 180.93it/s]

[Feature Set: xysd_4] Epoch [41/100] - Avg Loss: 0.1049
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Epoch 42/100: 100%|         | 570/570 [00:03<00:00, 180.74it/s]

[Feature Set: xysd_4] Epoch [42/100] - Avg Loss: 0.1515
Epoch 43/100: 100%|         | 570/570 [00:03<00:00, 175.63it/s]

[Feature Set: xysd_4] Epoch [43/100] - Avg Loss: 0.0816
Epoch 44/100: 100%|         | 570/570 [00:03<00:00, 180.10it/s]

[Feature Set: xysd_4] Epoch [44/100] - Avg Loss: 0.0990
Epoch 45/100: 100%|         | 570/570 [00:03<00:00, 181.58it/s]

[Feature Set: xysd_4] Epoch [45/100] - Avg Loss: 0.0822
Epoch 46/100: 100%|         | 570/570 [00:03<00:00, 180.47it/s]

[Feature Set: xysd_4] Epoch [46/100] - Avg Loss: 0.0766
Epoch 47/100: 100%|         | 570/570 [00:03<00:00, 180.62it/s]

[Feature Set: xysd_4] Epoch [47/100] - Avg Loss: 0.0971
Epoch 48/100: 100%|         | 570/570 [00:03<00:00, 181.28it/s]

[Feature Set: xysd_4] Epoch [48/100] - Avg Loss: 0.1377
Epoch 49/100: 100%|         | 570/570 [00:03<00:00, 180.30it/s]

[Feature Set: xysd_4] Epoch [49/100] - Avg Loss: 0.0755
Epoch 50/100: 100%|         | 570/570 [00:03<00:00, 180.56it/s]

[Feature Set: xysd_4] Epoch [50/100] - Avg Loss: 0.0887
Epoch 51/100: 100%|         | 570/570 [00:03<00:00, 180.48it/s]

[Feature Set: xysd_4] Epoch [51/100] - Avg Loss: 0.1409
Epoch 52/100: 100%|         | 570/570 [00:03<00:00, 180.67it/s]

[Feature Set: xysd_4] Epoch [52/100] - Avg Loss: 0.0874
Epoch 53/100: 100%|         | 570/570 [00:03<00:00, 180.42it/s]

[Feature Set: xysd_4] Epoch [53/100] - Avg Loss: 0.0760
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Epoch 54/100: 100%|        | 570/570 [00:03<00:00, 179.88it/s]

[Feature Set: xysd_4] Epoch [54/100] - Avg Loss: 0.0481

Epoch 55/100: 100%|        | 570/570 [00:03<00:00, 181.35it/s]

[Feature Set: xysd_4] Epoch [55/100] - Avg Loss: 0.1054

Epoch 56/100: 100%|        | 570/570 [00:03<00:00, 179.90it/s]

[Feature Set: xysd_4] Epoch [56/100] - Avg Loss: 0.1098

Epoch 57/100: 100%|        | 570/570 [00:03<00:00, 180.31it/s]

[Feature Set: xysd_4] Epoch [57/100] - Avg Loss: 0.0701

Epoch 58/100: 100%|        | 570/570 [00:03<00:00, 181.88it/s]

[Feature Set: xysd_4] Epoch [58/100] - Avg Loss: 0.0543

Epoch 59/100: 100%|        | 570/570 [00:03<00:00, 180.44it/s]

[Feature Set: xysd_4] Epoch [59/100] - Avg Loss: 0.0487

Epoch 60/100: 100%|        | 570/570 [00:03<00:00, 181.30it/s]

[Feature Set: xysd_4] Epoch [60/100] - Avg Loss: 0.0852

Epoch 61/100: 100%|        | 570/570 [00:03<00:00, 180.16it/s]

[Feature Set: xysd_4] Epoch [61/100] - Avg Loss: 0.0588

Epoch 62/100: 100%|        | 570/570 [00:03<00:00, 180.67it/s]

[Feature Set: xysd_4] Epoch [62/100] - Avg Loss: 0.0692

Epoch 63/100: 100%|        | 570/570 [00:03<00:00, 181.11it/s]

[Feature Set: xysd_4] Epoch [63/100] - Avg Loss: 0.0639

Epoch 64/100: 100%|        | 570/570 [00:03<00:00, 180.71it/s]

[Feature Set: xysd_4] Epoch [64/100] - Avg Loss: 0.0394

Epoch 65/100: 100%|        | 570/570 [00:03<00:00, 180.66it/s]

[Feature Set: xysd_4] Epoch [65/100] - Avg Loss: 0.0452
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Epoch 66/100: 100%| | 570/570 [00:03<00:00, 181.49it/s]

[Feature Set: xysd_4] Epoch [66/100] - Avg Loss: 0.1097

Epoch 67/100: 100%| | 570/570 [00:03<00:00, 179.92it/s]

[Feature Set: xysd_4] Epoch [67/100] - Avg Loss: 0.0849

Epoch 68/100: 100%| | 570/570 [00:03<00:00, 180.42it/s]

[Feature Set: xysd_4] Epoch [68/100] - Avg Loss: 0.0223

Epoch 69/100: 100%| | 570/570 [00:03<00:00, 181.67it/s]

[Feature Set: xysd_4] Epoch [69/100] - Avg Loss: 0.0280

Epoch 70/100: 100%| | 570/570 [00:03<00:00, 180.37it/s]

[Feature Set: xysd_4] Epoch [70/100] - Avg Loss: 0.0441

Epoch 71/100: 100%| | 570/570 [00:03<00:00, 179.72it/s]

[Feature Set: xysd_4] Epoch [71/100] - Avg Loss: 0.0340

Epoch 72/100: 100%| | 570/570 [00:03<00:00, 181.44it/s]

[Feature Set: xysd_4] Epoch [72/100] - Avg Loss: 0.0124

Epoch 73/100: 100%| | 570/570 [00:03<00:00, 177.63it/s]

[Feature Set: xysd_4] Epoch [73/100] - Avg Loss: 0.0478

Epoch 74/100: 100%| | 570/570 [00:03<00:00, 180.34it/s]

[Feature Set: xysd_4] Epoch [74/100] - Avg Loss: 0.0587

Epoch 75/100: 100%| | 570/570 [00:03<00:00, 181.25it/s]

[Feature Set: xysd_4] Epoch [75/100] - Avg Loss: 0.0481

Epoch 76/100: 100%| | 570/570 [00:03<00:00, 180.34it/s]

[Feature Set: xysd_4] Epoch [76/100] - Avg Loss: 0.0739

Epoch 77/100: 100%| | 570/570 [00:03<00:00, 180.51it/s]

[Feature Set: xysd_4] Epoch [77/100] - Avg Loss: 0.0793

Epoch 78/100: 100%| | 570/570 [00:03<00:00, 181.18it/s]

[Feature Set: xysd_4] Epoch [78/100] - Avg Loss: 0.0493

Epoch 79/100: 100%| | 570/570 [00:03<00:00, 180.12it/s]

[Feature Set: xysd_4] Epoch [79/100] - Avg Loss: 0.0189

Epoch 80/100: 100%| | 570/570 [00:03<00:00, 180.38it/s]

[Feature Set: xysd_4] Epoch [80/100] - Avg Loss: 0.0188

Epoch 81/100: 100%| | 570/570 [00:03<00:00, 180.41it/s]

[Feature Set: xysd_4] Epoch [81/100] - Avg Loss: 0.0221

Epoch 82/100: 100%| | 570/570 [00:03<00:00, 180.20it/s]

[Feature Set: xysd_4] Epoch [82/100] - Avg Loss: 0.0367

Epoch 83/100: 100%| | 570/570 [00:03<00:00, 182.26it/s]

[Feature Set: xysd_4] Epoch [83/100] - Avg Loss: 0.0288

Epoch 84/100: 100%| | 570/570 [00:03<00:00, 180.49it/s]

[Feature Set: xysd_4] Epoch [84/100] - Avg Loss: 0.0555

Epoch 85/100: 100%| | 570/570 [00:03<00:00, 180.09it/s]

[Feature Set: xysd_4] Epoch [85/100] - Avg Loss: 0.0497

Epoch 86/100: 100%| | 570/570 [00:03<00:00, 181.43it/s]

[Feature Set: xysd_4] Epoch [86/100] - Avg Loss: 0.0712

Epoch 87/100: 100%| | 570/570 [00:03<00:00, 180.68it/s]

[Feature Set: xysd_4] Epoch [87/100] - Avg Loss: 0.0193

Epoch 88/100: 100%| | 570/570 [00:03<00:00, 181.74it/s]

[Feature Set: xysd_4] Epoch [88/100] - Avg Loss: 0.0946

Epoch 89/100: 100%| | 570/570 [00:03<00:00, 180.27it/s]

[Feature Set: xysd_4] Epoch [89/100] - Avg Loss: 0.0758

Epoch 90/100: 100%| | 570/570 [00:03<00:00, 170.26it/s]

[Feature Set: xysd_4] Epoch [90/100] - Avg Loss: 0.0793

Epoch 91/100: 100%| | 570/570 [00:03<00:00, 178.34it/s]

[Feature Set: xysd_4] Epoch [91/100] - Avg Loss: 0.0381

Epoch 92/100: 100%| | 570/570 [00:03<00:00, 152.75it/s]

[Feature Set: xysd_4] Epoch [92/100] - Avg Loss: 0.0107

Epoch 93/100: 100%| | 570/570 [00:04<00:00, 126.43it/s]

[Feature Set: xysd_4] Epoch [93/100] - Avg Loss: 0.0106

Epoch 94/100: 100%| | 570/570 [00:03<00:00, 178.00it/s]

[Feature Set: xysd_4] Epoch [94/100] - Avg Loss: 0.0197

Epoch 95/100: 100%| | 570/570 [00:03<00:00, 178.92it/s]

[Feature Set: xysd_4] Epoch [95/100] - Avg Loss: 0.0188

Epoch 96/100: 100%| | 570/570 [00:03<00:00, 161.65it/s]

[Feature Set: xysd_4] Epoch [96/100] - Avg Loss: 0.0133

Epoch 97/100: 100%| | 570/570 [00:03<00:00, 170.41it/s]

[Feature Set: xysd_4] Epoch [97/100] - Avg Loss: 0.0146

Epoch 98/100: 100%| | 570/570 [00:03<00:00, 179.65it/s]

[Feature Set: xysd_4] Epoch [98/100] - Avg Loss: 0.0818

Epoch 99/100: 100%| | 570/570 [00:04<00:00, 127.28it/s]

[Feature Set: xysd_4] Epoch [99/100] - Avg Loss: 0.0730

Epoch 100/100: 100%| | 570/570 [00:03<00:00, 176.67it/s]

[Feature Set: xysd_4] Epoch [100/100] - Avg Loss: 0.0129

[Eval] xysd_4: 100%| | 143/143 [00:00<00:00, 319.89it/s]
Epoch 1/100: 100%| | 570/570 [00:03<00:00, 178.88it/s]

[Feature Set: xydd_4] Epoch [1/100] - Avg Loss: 0.6760

Epoch 2/100: 100%| | 570/570 [00:03<00:00, 177.23it/s]

[Feature Set: xydd_4] Epoch [2/100] - Avg Loss: 0.6676

Epoch 3/100: 100%| | 570/570 [00:03<00:00, 178.15it/s]

[Feature Set: xydd_4] Epoch [3/100] - Avg Loss: 0.6625

Epoch 4/100: 100%| | 570/570 [00:03<00:00, 179.32it/s]

[Feature Set: xydd_4] Epoch [4/100] - Avg Loss: 0.6519

Epoch 5/100: 100%| | 570/570 [00:03<00:00, 176.20it/s]

[Feature Set: xydd_4] Epoch [5/100] - Avg Loss: 0.6427

Epoch 6/100: 100%| | 570/570 [00:03<00:00, 178.10it/s]

[Feature Set: xydd_4] Epoch [6/100] - Avg Loss: 0.6326

Epoch 7/100: 100%| | 570/570 [00:03<00:00, 180.14it/s]

[Feature Set: xydd_4] Epoch [7/100] - Avg Loss: 0.6248

Epoch 8/100: 100%| | 570/570 [00:03<00:00, 178.21it/s]

[Feature Set: xydd_4] Epoch [8/100] - Avg Loss: 0.6112

Epoch 9/100: 100%| | 570/570 [00:03<00:00, 176.67it/s]

[Feature Set: xydd_4] Epoch [9/100] - Avg Loss: 0.5936

Epoch 10/100: 100%| | 570/570 [00:03<00:00, 179.46it/s]

[Feature Set: xydd_4] Epoch [10/100] - Avg Loss: 0.5757

Epoch 11/100: 100%| | 570/570 [00:03<00:00, 177.19it/s]

[Feature Set: xydd_4] Epoch [11/100] - Avg Loss: 0.5639

Epoch 12/100: 100%| | 570/570 [00:03<00:00, 177.27it/s]

[Feature Set: xydd_4] Epoch [12/100] - Avg Loss: 0.5430

Epoch 13/100: 100%| | 570/570 [00:03<00:00, 177.32it/s]

[Feature Set: xydd_4] Epoch [13/100] - Avg Loss: 0.5236

Epoch 14/100: 100%| | 570/570 [12:27<00:00, 1.31s/it]

[Feature Set: xydd_4] Epoch [14/100] - Avg Loss: 0.4912

Epoch 15/100: 100%| | 570/570 [00:05<00:00, 112.66it/s]

[Feature Set: xydd_4] Epoch [15/100] - Avg Loss: 0.4691

Epoch 16/100: 100%| | 570/570 [00:04<00:00, 139.52it/s]

[Feature Set: xydd_4] Epoch [16/100] - Avg Loss: 0.4467

Epoch 17/100: 100%| | 570/570 [00:03<00:00, 164.53it/s]

[Feature Set: xydd_4] Epoch [17/100] - Avg Loss: 0.4364

Epoch 18/100: 100%| | 570/570 [00:03<00:00, 171.76it/s]

[Feature Set: xydd_4] Epoch [18/100] - Avg Loss: 0.4076

Epoch 19/100: 100%| | 570/570 [00:03<00:00, 168.52it/s]

[Feature Set: xydd_4] Epoch [19/100] - Avg Loss: 0.3974

Epoch 20/100: 100%| | 570/570 [00:03<00:00, 172.61it/s]

[Feature Set: xydd_4] Epoch [20/100] - Avg Loss: 0.3608

Epoch 21/100: 100%| | 570/570 [00:03<00:00, 171.18it/s]

[Feature Set: xydd_4] Epoch [21/100] - Avg Loss: 0.3617

Epoch 22/100: 100%| | 570/570 [00:03<00:00, 172.35it/s]

[Feature Set: xydd_4] Epoch [22/100] - Avg Loss: 0.3573

Epoch 23/100: 100%| | 570/570 [00:03<00:00, 175.44it/s]

[Feature Set: xydd_4] Epoch [23/100] - Avg Loss: 0.3302

Epoch 24/100: 100%| | 570/570 [00:03<00:00, 174.49it/s]

[Feature Set: xydd_4] Epoch [24/100] - Avg Loss: 0.3799

Epoch 25/100: 100%| | 570/570 [00:03<00:00, 173.89it/s]

[Feature Set: xydd_4] Epoch [25/100] - Avg Loss: 0.3476

Epoch 26/100: 100%| | 570/570 [00:03<00:00, 175.51it/s]

[Feature Set: xydd_4] Epoch [26/100] - Avg Loss: 0.3056

Epoch 27/100: 100%| | 570/570 [00:03<00:00, 174.83it/s]

[Feature Set: xydd_4] Epoch [27/100] - Avg Loss: 0.3011

Epoch 28/100: 100%| | 570/570 [00:03<00:00, 174.90it/s]

[Feature Set: xydd_4] Epoch [28/100] - Avg Loss: 0.3065

Epoch 29/100: 100%| | 570/570 [00:03<00:00, 174.51it/s]

[Feature Set: xydd_4] Epoch [29/100] - Avg Loss: 0.2865

Epoch 30/100: 100%| | 570/570 [00:03<00:00, 175.43it/s]

[Feature Set: xydd_4] Epoch [30/100] - Avg Loss: 0.2918

Epoch 31/100: 100%| | 570/570 [00:03<00:00, 173.78it/s]

[Feature Set: xydd_4] Epoch [31/100] - Avg Loss: 0.2657

Epoch 32/100: 100%| | 570/570 [00:03<00:00, 174.42it/s]

[Feature Set: xydd_4] Epoch [32/100] - Avg Loss: 0.2834

Epoch 33/100: 100%| | 570/570 [00:03<00:00, 174.65it/s]

[Feature Set: xydd_4] Epoch [33/100] - Avg Loss: 0.2634

Epoch 34/100: 100%| | 570/570 [00:03<00:00, 174.37it/s]

[Feature Set: xydd_4] Epoch [34/100] - Avg Loss: 0.2281

Epoch 35/100: 100%| | 570/570 [00:03<00:00, 173.96it/s]

[Feature Set: xydd_4] Epoch [35/100] - Avg Loss: 0.2235

Epoch 36/100: 100%| | 570/570 [00:03<00:00, 174.65it/s]

[Feature Set: xydd_4] Epoch [36/100] - Avg Loss: 0.2386

Epoch 37/100: 100%| | 570/570 [00:03<00:00, 175.06it/s]

[Feature Set: xydd_4] Epoch [37/100] – Avg Loss: 0.2137

Epoch 38/100: 100%| | 570/570 [00:03<00:00, 173.32it/s]

[Feature Set: xydd_4] Epoch [38/100] – Avg Loss: 0.2058

Epoch 39/100: 100%| | 570/570 [00:03<00:00, 175.17it/s]

[Feature Set: xydd_4] Epoch [39/100] – Avg Loss: 0.2077

Epoch 40/100: 100%| | 570/570 [00:03<00:00, 167.70it/s]

[Feature Set: xydd_4] Epoch [40/100] – Avg Loss: 0.2016

Epoch 41/100: 100%| | 570/570 [00:03<00:00, 173.10it/s]

[Feature Set: xydd_4] Epoch [41/100] – Avg Loss: 0.1907

Epoch 42/100: 100%| | 570/570 [00:03<00:00, 173.57it/s]

[Feature Set: xydd_4] Epoch [42/100] – Avg Loss: 0.1731

Epoch 43/100: 100%| | 570/570 [00:03<00:00, 158.02it/s]

[Feature Set: xydd_4] Epoch [43/100] – Avg Loss: 0.1810

Epoch 44/100: 100%| | 570/570 [00:04<00:00, 142.31it/s]

[Feature Set: xydd_4] Epoch [44/100] – Avg Loss: 0.1863

Epoch 45/100: 100%| | 570/570 [00:04<00:00, 140.62it/s]

[Feature Set: xydd_4] Epoch [45/100] – Avg Loss: 0.1646

Epoch 46/100: 100%| | 570/570 [00:03<00:00, 172.90it/s]

[Feature Set: xydd_4] Epoch [46/100] – Avg Loss: 0.2377

Epoch 47/100: 100%| | 570/570 [00:03<00:00, 172.70it/s]

[Feature Set: xydd_4] Epoch [47/100] – Avg Loss: 0.1444

Epoch 48/100: 100%| | 570/570 [00:03<00:00, 171.32it/s]

[Feature Set: xydd_4] Epoch [48/100] – Avg Loss: 0.1857

Epoch 49/100: 100%| | 570/570 [00:03<00:00, 172.34it/s]

[Feature Set: xydd_4] Epoch [49/100] - Avg Loss: 0.1738

Epoch 50/100: 100%| | 570/570 [00:03<00:00, 174.89it/s]

[Feature Set: xydd_4] Epoch [50/100] - Avg Loss: 0.1640

Epoch 51/100: 100%| | 570/570 [00:03<00:00, 173.97it/s]

[Feature Set: xydd_4] Epoch [51/100] - Avg Loss: 0.1631

Epoch 52/100: 100%| | 570/570 [00:03<00:00, 175.14it/s]

[Feature Set: xydd_4] Epoch [52/100] - Avg Loss: 0.1230

Epoch 53/100: 100%| | 570/570 [00:03<00:00, 175.46it/s]

[Feature Set: xydd_4] Epoch [53/100] - Avg Loss: 0.1759

Epoch 54/100: 100%| | 570/570 [00:03<00:00, 176.20it/s]

[Feature Set: xydd_4] Epoch [54/100] - Avg Loss: 0.1739

Epoch 55/100: 100%| | 570/570 [00:03<00:00, 174.13it/s]

[Feature Set: xydd_4] Epoch [55/100] - Avg Loss: 0.1183

Epoch 56/100: 100%| | 570/570 [00:03<00:00, 176.96it/s]

[Feature Set: xydd_4] Epoch [56/100] - Avg Loss: 0.1034

Epoch 57/100: 100%| | 570/570 [00:03<00:00, 176.31it/s]

[Feature Set: xydd_4] Epoch [57/100] - Avg Loss: 0.1044

Epoch 58/100: 100%| | 570/570 [00:03<00:00, 176.24it/s]

[Feature Set: xydd_4] Epoch [58/100] - Avg Loss: 0.1074

Epoch 59/100: 100%| | 570/570 [00:03<00:00, 174.27it/s]

[Feature Set: xydd_4] Epoch [59/100] - Avg Loss: 0.1444

Epoch 60/100: 100%| | 570/570 [00:03<00:00, 176.32it/s]

[Feature Set: xydd_4] Epoch [60/100] - Avg Loss: 0.1427

Epoch 61/100: 100%| | 570/570 [00:03<00:00, 175.37it/s]

[Feature Set: xydd_4] Epoch [61/100] – Avg Loss: 0.1054

Epoch 62/100: 100%| | 570/570 [00:03<00:00, 176.86it/s]

[Feature Set: xydd_4] Epoch [62/100] – Avg Loss: 0.0996

Epoch 63/100: 100%| | 570/570 [00:03<00:00, 175.70it/s]

[Feature Set: xydd_4] Epoch [63/100] – Avg Loss: 0.1110

Epoch 64/100: 100%| | 570/570 [00:03<00:00, 176.91it/s]

[Feature Set: xydd_4] Epoch [64/100] – Avg Loss: 0.1271

Epoch 65/100: 100%| | 570/570 [00:03<00:00, 174.62it/s]

[Feature Set: xydd_4] Epoch [65/100] – Avg Loss: 0.1414

Epoch 66/100: 100%| | 570/570 [00:03<00:00, 176.65it/s]

[Feature Set: xydd_4] Epoch [66/100] – Avg Loss: 0.0668

Epoch 67/100: 100%| | 570/570 [00:03<00:00, 175.58it/s]

[Feature Set: xydd_4] Epoch [67/100] – Avg Loss: 0.1328

Epoch 68/100: 100%| | 570/570 [00:03<00:00, 176.45it/s]

[Feature Set: xydd_4] Epoch [68/100] – Avg Loss: 0.0881

Epoch 69/100: 100%| | 570/570 [00:03<00:00, 176.82it/s]

[Feature Set: xydd_4] Epoch [69/100] – Avg Loss: 0.0922

Epoch 70/100: 100%| | 570/570 [00:03<00:00, 176.52it/s]

[Feature Set: xydd_4] Epoch [70/100] – Avg Loss: 0.1087

Epoch 71/100: 100%| | 570/570 [00:03<00:00, 175.24it/s]

[Feature Set: xydd_4] Epoch [71/100] – Avg Loss: 0.0770

Epoch 72/100: 100%| | 570/570 [00:03<00:00, 176.73it/s]

[Feature Set: xydd_4] Epoch [72/100] – Avg Loss: 0.0974

Epoch 73/100: 100%| | 570/570 [00:03<00:00, 176.56it/s]

[Feature Set: xydd_4] Epoch [73/100] - Avg Loss: 0.1479

Epoch 74/100: 100%| | 570/570 [00:03<00:00, 175.14it/s]

[Feature Set: xydd_4] Epoch [74/100] - Avg Loss: 0.0896

Epoch 75/100: 100%| | 570/570 [00:03<00:00, 176.32it/s]

[Feature Set: xydd_4] Epoch [75/100] - Avg Loss: 0.1031

Epoch 76/100: 100%| | 570/570 [00:03<00:00, 176.55it/s]

[Feature Set: xydd_4] Epoch [76/100] - Avg Loss: 0.1640

Epoch 77/100: 100%| | 570/570 [00:03<00:00, 176.66it/s]

[Feature Set: xydd_4] Epoch [77/100] - Avg Loss: 0.0699

Epoch 78/100: 100%| | 570/570 [00:03<00:00, 173.12it/s]

[Feature Set: xydd_4] Epoch [78/100] - Avg Loss: 0.0745

Epoch 79/100: 100%| | 570/570 [00:03<00:00, 150.75it/s]

[Feature Set: xydd_4] Epoch [79/100] - Avg Loss: 0.0776

Epoch 80/100: 100%| | 570/570 [00:03<00:00, 153.76it/s]

[Feature Set: xydd_4] Epoch [80/100] - Avg Loss: 0.0688

Epoch 81/100: 100%| | 570/570 [00:03<00:00, 175.02it/s]

[Feature Set: xydd_4] Epoch [81/100] - Avg Loss: 0.0904

Epoch 82/100: 100%| | 570/570 [00:03<00:00, 175.87it/s]

[Feature Set: xydd_4] Epoch [82/100] - Avg Loss: 0.0982

Epoch 83/100: 100%| | 570/570 [00:03<00:00, 173.80it/s]

[Feature Set: xydd_4] Epoch [83/100] - Avg Loss: 0.0858

Epoch 84/100: 100%| | 570/570 [00:03<00:00, 175.81it/s]

[Feature Set: xydd_4] Epoch [84/100] - Avg Loss: 0.1289

Epoch 85/100: 100%| | 570/570 [00:03<00:00, 152.84it/s]

[Feature Set: xydd_4] Epoch [85/100] - Avg Loss: 0.0639

Epoch 86/100: 100%| | 570/570 [00:04<00:00, 138.23it/s]

[Feature Set: xydd_4] Epoch [86/100] - Avg Loss: 0.1053

Epoch 87/100: 100%| | 570/570 [00:03<00:00, 153.69it/s]

[Feature Set: xydd_4] Epoch [87/100] - Avg Loss: 0.0845

Epoch 88/100: 100%| | 570/570 [00:03<00:00, 175.35it/s]

[Feature Set: xydd_4] Epoch [88/100] - Avg Loss: 0.0425

Epoch 89/100: 100%| | 570/570 [00:03<00:00, 174.38it/s]

[Feature Set: xydd_4] Epoch [89/100] - Avg Loss: 0.0816

Epoch 90/100: 100%| | 570/570 [00:03<00:00, 175.84it/s]

[Feature Set: xydd_4] Epoch [90/100] - Avg Loss: 0.0474

Epoch 91/100: 100%| | 570/570 [00:03<00:00, 174.87it/s]

[Feature Set: xydd_4] Epoch [91/100] - Avg Loss: 0.0484

Epoch 92/100: 100%| | 570/570 [00:03<00:00, 176.19it/s]

[Feature Set: xydd_4] Epoch [92/100] - Avg Loss: 0.1763

Epoch 93/100: 100%| | 570/570 [00:03<00:00, 175.02it/s]

[Feature Set: xydd_4] Epoch [93/100] - Avg Loss: 0.1059

Epoch 94/100: 100%| | 570/570 [00:03<00:00, 172.52it/s]

[Feature Set: xydd_4] Epoch [94/100] - Avg Loss: 0.0470

Epoch 95/100: 100%| | 570/570 [00:03<00:00, 175.03it/s]

[Feature Set: xydd_4] Epoch [95/100] - Avg Loss: 0.0290

Epoch 96/100: 100%| | 570/570 [00:03<00:00, 174.41it/s]

[Feature Set: xydd_4] Epoch [96/100] - Avg Loss: 0.0336

Epoch 97/100: 100%| | 570/570 [00:03<00:00, 175.71it/s]

[Feature Set: xydd_4] Epoch [97/100] - Avg Loss: 0.0494

Epoch 98/100: 100%| | 570/570 [00:03<00:00, 175.81it/s]

[Feature Set: xydd_4] Epoch [98/100] - Avg Loss: 0.1182

Epoch 99/100: 100%| | 570/570 [00:03<00:00, 175.00it/s]

[Feature Set: xydd_4] Epoch [99/100] - Avg Loss: 0.0674

Epoch 100/100: 100%| | 570/570 [00:03<00:00, 174.85it/s]

[Feature Set: xydd_4] Epoch [100/100] - Avg Loss: 0.0803

[Eval] xydd_4: 100%| | 143/143 [00:00<00:00, 320.81it/s]
Epoch 1/100: 100%| | 570/570 [00:03<00:00, 178.04it/s]

[Feature Set: xydsc_5] Epoch [1/100] - Avg Loss: 0.6772

Epoch 2/100: 100%| | 570/570 [00:03<00:00, 177.33it/s]

[Feature Set: xydsc_5] Epoch [2/100] - Avg Loss: 0.6677

Epoch 3/100: 100%| | 570/570 [00:03<00:00, 178.19it/s]

[Feature Set: xydsc_5] Epoch [3/100] - Avg Loss: 0.6630

Epoch 4/100: 100%| | 570/570 [00:03<00:00, 176.86it/s]

[Feature Set: xydsc_5] Epoch [4/100] - Avg Loss: 0.6539

Epoch 5/100: 100%| | 570/570 [00:03<00:00, 177.45it/s]

[Feature Set: xydsc_5] Epoch [5/100] - Avg Loss: 0.6323

Epoch 6/100: 100%| | 570/570 [00:03<00:00, 173.29it/s]

[Feature Set: xydsc_5] Epoch [6/100] - Avg Loss: 0.6038

Epoch 7/100: 100%| | 570/570 [00:03<00:00, 178.27it/s]

[Feature Set: xydsc_5] Epoch [7/100] - Avg Loss: 0.5803

Epoch 8/100: 100%| | 570/570 [00:03<00:00, 177.38it/s]

[Feature Set: xydsc_5] Epoch [8/100] - Avg Loss: 0.5625

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Epoch 9/100: 100%|        | 570/570 [00:03<00:00, 178.19it/s]


[Feature Set: xydsc_5] Epoch [9/100] - Avg Loss: 0.5404

Epoch 10/100: 100%|        | 570/570 [00:03<00:00, 179.24it/s]


[Feature Set: xydsc_5] Epoch [10/100] - Avg Loss: 0.5099

Epoch 11/100: 100%|        | 570/570 [00:03<00:00, 179.24it/s]


[Feature Set: xydsc_5] Epoch [11/100] - Avg Loss: 0.4960

Epoch 12/100: 100%|        | 570/570 [00:03<00:00, 177.69it/s]


[Feature Set: xydsc_5] Epoch [12/100] - Avg Loss: 0.4626

Epoch 13/100: 100%|        | 570/570 [00:03<00:00, 179.01it/s]


[Feature Set: xydsc_5] Epoch [13/100] - Avg Loss: 0.4420

Epoch 14/100: 100%|        | 570/570 [00:03<00:00, 178.56it/s]


[Feature Set: xydsc_5] Epoch [14/100] - Avg Loss: 0.4167

Epoch 15/100: 100%|        | 570/570 [00:03<00:00, 179.28it/s]


[Feature Set: xydsc_5] Epoch [15/100] - Avg Loss: 0.3884

Epoch 16/100: 100%|        | 570/570 [00:03<00:00, 178.04it/s]


[Feature Set: xydsc_5] Epoch [16/100] - Avg Loss: 0.4046

Epoch 17/100: 100%|        | 570/570 [00:03<00:00, 179.82it/s]


[Feature Set: xydsc_5] Epoch [17/100] - Avg Loss: 0.3843

Epoch 18/100: 100%|        | 570/570 [00:03<00:00, 179.65it/s]


[Feature Set: xydsc_5] Epoch [18/100] - Avg Loss: 0.3493

Epoch 19/100: 100%|        | 570/570 [00:03<00:00, 174.97it/s]


[Feature Set: xydsc_5] Epoch [19/100] - Avg Loss: 0.3590

Epoch 20/100: 100%|        | 570/570 [00:03<00:00, 177.72it/s]


[Feature Set: xydsc_5] Epoch [20/100] - Avg Loss: 0.3357
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Epoch 21/100: 100%|        | 570/570 [00:03<00:00, 177.23it/s]

[Feature Set: xydsc_5] Epoch [21/100] - Avg Loss: 0.3177
Epoch 22/100: 100%|        | 570/570 [00:03<00:00, 180.27it/s]

[Feature Set: xydsc_5] Epoch [22/100] - Avg Loss: 0.3011
Epoch 23/100: 100%|        | 570/570 [00:03<00:00, 179.86it/s]

[Feature Set: xydsc_5] Epoch [23/100] - Avg Loss: 0.2782
Epoch 24/100: 100%|        | 570/570 [00:03<00:00, 177.94it/s]

[Feature Set: xydsc_5] Epoch [24/100] - Avg Loss: 0.2764
Epoch 25/100: 100%|        | 570/570 [00:03<00:00, 179.87it/s]

[Feature Set: xydsc_5] Epoch [25/100] - Avg Loss: 0.3131
Epoch 26/100: 100%|        | 570/570 [00:03<00:00, 176.60it/s]

[Feature Set: xydsc_5] Epoch [26/100] - Avg Loss: 0.2626
Epoch 27/100: 100%|        | 570/570 [00:03<00:00, 179.45it/s]

[Feature Set: xydsc_5] Epoch [27/100] - Avg Loss: 0.2573
Epoch 28/100: 100%|        | 570/570 [00:03<00:00, 178.45it/s]

[Feature Set: xydsc_5] Epoch [28/100] - Avg Loss: 0.2542
Epoch 29/100: 100%|        | 570/570 [00:03<00:00, 179.56it/s]

[Feature Set: xydsc_5] Epoch [29/100] - Avg Loss: 0.2340
Epoch 30/100: 100%|        | 570/570 [00:03<00:00, 180.06it/s]

[Feature Set: xydsc_5] Epoch [30/100] - Avg Loss: 0.2039
Epoch 31/100: 100%|        | 570/570 [00:03<00:00, 178.72it/s]

[Feature Set: xydsc_5] Epoch [31/100] - Avg Loss: 0.2115
Epoch 32/100: 100%|        | 570/570 [00:03<00:00, 178.21it/s]

[Feature Set: xydsc_5] Epoch [32/100] - Avg Loss: 0.2491
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Epoch 33/100: 100%|        | 570/570 [00:03<00:00, 179.82it/s]

[Feature Set: xydsc_5] Epoch [33/100] - Avg Loss: 0.2347
Epoch 34/100: 100%|        | 570/570 [00:03<00:00, 179.59it/s]

[Feature Set: xydsc_5] Epoch [34/100] - Avg Loss: 0.2157
Epoch 35/100: 100%|        | 570/570 [00:03<00:00, 179.88it/s]

[Feature Set: xydsc_5] Epoch [35/100] - Avg Loss: 0.2194
Epoch 36/100: 100%|        | 570/570 [00:03<00:00, 178.50it/s]

[Feature Set: xydsc_5] Epoch [36/100] - Avg Loss: 0.1967
Epoch 37/100: 100%|        | 570/570 [00:03<00:00, 179.14it/s]

[Feature Set: xydsc_5] Epoch [37/100] - Avg Loss: 0.1536
Epoch 38/100: 100%|        | 570/570 [00:03<00:00, 180.77it/s]

[Feature Set: xydsc_5] Epoch [38/100] - Avg Loss: 0.1342
Epoch 39/100: 100%|        | 570/570 [00:03<00:00, 176.85it/s]

[Feature Set: xydsc_5] Epoch [39/100] - Avg Loss: 0.1507
Epoch 40/100: 100%|        | 570/570 [00:03<00:00, 178.01it/s]

[Feature Set: xydsc_5] Epoch [40/100] - Avg Loss: 0.1961
Epoch 41/100: 100%|        | 570/570 [00:03<00:00, 180.04it/s]

[Feature Set: xydsc_5] Epoch [41/100] - Avg Loss: 0.1799
Epoch 42/100: 100%|        | 570/570 [00:03<00:00, 180.07it/s]

[Feature Set: xydsc_5] Epoch [42/100] - Avg Loss: 0.1786
Epoch 43/100: 100%|        | 570/570 [00:03<00:00, 179.51it/s]

[Feature Set: xydsc_5] Epoch [43/100] - Avg Loss: 0.1323
Epoch 44/100: 100%|        | 570/570 [00:03<00:00, 178.67it/s]

[Feature Set: xydsc_5] Epoch [44/100] - Avg Loss: 0.1103
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Epoch 45/100: 100%|         | 570/570 [00:03<00:00, 178.37it/s]

[Feature Set: xydsc_5] Epoch [45/100] - Avg Loss: 0.1816
Epoch 46/100: 100%|         | 570/570 [00:03<00:00, 179.83it/s]

[Feature Set: xydsc_5] Epoch [46/100] - Avg Loss: 0.1316
Epoch 47/100: 100%|         | 570/570 [00:03<00:00, 180.14it/s]

[Feature Set: xydsc_5] Epoch [47/100] - Avg Loss: 0.1092
Epoch 48/100: 100%|         | 570/570 [00:03<00:00, 177.95it/s]

[Feature Set: xydsc_5] Epoch [48/100] - Avg Loss: 0.1298
Epoch 49/100: 100%|         | 570/570 [00:03<00:00, 177.13it/s]

[Feature Set: xydsc_5] Epoch [49/100] - Avg Loss: 0.1371
Epoch 50/100: 100%|         | 570/570 [00:03<00:00, 179.68it/s]

[Feature Set: xydsc_5] Epoch [50/100] - Avg Loss: 0.2269
Epoch 51/100: 100%|         | 570/570 [00:03<00:00, 177.85it/s]

[Feature Set: xydsc_5] Epoch [51/100] - Avg Loss: 0.1215
Epoch 52/100: 100%|         | 570/570 [00:03<00:00, 179.37it/s]

[Feature Set: xydsc_5] Epoch [52/100] - Avg Loss: 0.1102
Epoch 53/100: 100%|         | 570/570 [00:03<00:00, 179.08it/s]

[Feature Set: xydsc_5] Epoch [53/100] - Avg Loss: 0.1101
Epoch 54/100: 100%|         | 570/570 [00:03<00:00, 181.02it/s]

[Feature Set: xydsc_5] Epoch [54/100] - Avg Loss: 0.0850
Epoch 55/100: 100%|         | 570/570 [00:03<00:00, 178.38it/s]

[Feature Set: xydsc_5] Epoch [55/100] - Avg Loss: 0.0959
Epoch 56/100: 100%|         | 570/570 [00:03<00:00, 176.70it/s]

[Feature Set: xydsc_5] Epoch [56/100] - Avg Loss: 0.2345
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Epoch 57/100: 100%|        | 570/570 [00:03<00:00, 179.33it/s]

[Feature Set: xydsc_5] Epoch [57/100] - Avg Loss: 0.1527
Epoch 58/100: 100%|        | 570/570 [00:03<00:00, 179.72it/s]

[Feature Set: xydsc_5] Epoch [58/100] - Avg Loss: 0.0879
Epoch 59/100: 100%|        | 570/570 [00:03<00:00, 177.96it/s]

[Feature Set: xydsc_5] Epoch [59/100] - Avg Loss: 0.0722
Epoch 60/100: 100%|        | 570/570 [00:03<00:00, 179.66it/s]

[Feature Set: xydsc_5] Epoch [60/100] - Avg Loss: 0.1238
Epoch 61/100: 100%|        | 570/570 [00:03<00:00, 178.40it/s]

[Feature Set: xydsc_5] Epoch [61/100] - Avg Loss: 0.1328
Epoch 62/100: 100%|        | 570/570 [00:03<00:00, 179.43it/s]

[Feature Set: xydsc_5] Epoch [62/100] - Avg Loss: 0.1001
Epoch 63/100: 100%|        | 570/570 [00:03<00:00, 178.15it/s]

[Feature Set: xydsc_5] Epoch [63/100] - Avg Loss: 0.0899
Epoch 64/100: 100%|        | 570/570 [00:03<00:00, 179.57it/s]

[Feature Set: xydsc_5] Epoch [64/100] - Avg Loss: 0.0744
Epoch 65/100: 100%|        | 570/570 [00:03<00:00, 180.13it/s]

[Feature Set: xydsc_5] Epoch [65/100] - Avg Loss: 0.0943
Epoch 66/100: 100%|        | 570/570 [00:03<00:00, 179.62it/s]

[Feature Set: xydsc_5] Epoch [66/100] - Avg Loss: 0.1162
Epoch 67/100: 100%|        | 570/570 [00:03<00:00, 178.28it/s]

[Feature Set: xydsc_5] Epoch [67/100] - Avg Loss: 0.1072
Epoch 68/100: 100%|        | 570/570 [00:03<00:00, 179.33it/s]

[Feature Set: xydsc_5] Epoch [68/100] - Avg Loss: 0.0970
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Epoch 69/100: 100%|        | 570/570 [00:03<00:00, 179.66it/s]


[Feature Set: xydsc_5] Epoch [69/100] - Avg Loss: 0.0888

Epoch 70/100: 100%|        | 570/570 [00:03<00:00, 180.03it/s]


[Feature Set: xydsc_5] Epoch [70/100] - Avg Loss: 0.0754

Epoch 71/100: 100%|        | 570/570 [00:03<00:00, 178.14it/s]


[Feature Set: xydsc_5] Epoch [71/100] - Avg Loss: 0.0566

Epoch 72/100: 100%|        | 570/570 [00:03<00:00, 178.76it/s]


[Feature Set: xydsc_5] Epoch [72/100] - Avg Loss: 0.0425

Epoch 73/100: 100%|        | 570/570 [00:03<00:00, 179.71it/s]


[Feature Set: xydsc_5] Epoch [73/100] - Avg Loss: 0.0468

Epoch 74/100: 100%|        | 570/570 [00:03<00:00, 178.08it/s]


[Feature Set: xydsc_5] Epoch [74/100] - Avg Loss: 0.1027

Epoch 75/100: 100%|        | 570/570 [00:03<00:00, 179.45it/s]


[Feature Set: xydsc_5] Epoch [75/100] - Avg Loss: 0.0973

Epoch 76/100: 100%|        | 570/570 [00:03<00:00, 179.56it/s]


[Feature Set: xydsc_5] Epoch [76/100] - Avg Loss: 0.0810

Epoch 77/100: 100%|        | 570/570 [00:03<00:00, 179.32it/s]


[Feature Set: xydsc_5] Epoch [77/100] - Avg Loss: 0.0885

Epoch 78/100: 100%|        | 570/570 [00:03<00:00, 178.06it/s]


[Feature Set: xydsc_5] Epoch [78/100] - Avg Loss: 0.0489

Epoch 79/100: 100%|        | 570/570 [00:03<00:00, 179.91it/s]


[Feature Set: xydsc_5] Epoch [79/100] - Avg Loss: 0.1482

Epoch 80/100: 100%|        | 570/570 [00:03<00:00, 179.39it/s]


[Feature Set: xydsc_5] Epoch [80/100] - Avg Loss: 0.1069
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Epoch 81/100: 100%| | 570/570 [00:03<00:00, 179.94it/s]

[Feature Set: xydsc_5] Epoch [81/100] - Avg Loss: 0.0482

Epoch 82/100: 100%| | 570/570 [00:03<00:00, 178.95it/s]

[Feature Set: xydsc_5] Epoch [82/100] - Avg Loss: 0.0693

Epoch 83/100: 100%| | 570/570 [00:03<00:00, 180.28it/s]

[Feature Set: xydsc_5] Epoch [83/100] - Avg Loss: 0.0597

Epoch 84/100: 100%| | 570/570 [00:03<00:00, 179.44it/s]

[Feature Set: xydsc_5] Epoch [84/100] - Avg Loss: 0.0478

Epoch 85/100: 100%| | 570/570 [00:03<00:00, 179.75it/s]

[Feature Set: xydsc_5] Epoch [85/100] - Avg Loss: 0.0412

Epoch 86/100: 100%| | 570/570 [00:03<00:00, 178.13it/s]

[Feature Set: xydsc_5] Epoch [86/100] - Avg Loss: 0.0776

Epoch 87/100: 100%| | 570/570 [00:03<00:00, 179.57it/s]

[Feature Set: xydsc_5] Epoch [87/100] - Avg Loss: 0.1357

Epoch 88/100: 100%| | 570/570 [00:03<00:00, 178.97it/s]

[Feature Set: xydsc_5] Epoch [88/100] - Avg Loss: 0.0864

Epoch 89/100: 100%| | 570/570 [00:03<00:00, 179.38it/s]

[Feature Set: xydsc_5] Epoch [89/100] - Avg Loss: 0.0386

Epoch 90/100: 100%| | 570/570 [00:03<00:00, 178.12it/s]

[Feature Set: xydsc_5] Epoch [90/100] - Avg Loss: 0.0299

Epoch 91/100: 100%| | 570/570 [00:03<00:00, 179.56it/s]

[Feature Set: xydsc_5] Epoch [91/100] - Avg Loss: 0.0235

Epoch 92/100: 100%| | 570/570 [00:03<00:00, 179.65it/s]

[Feature Set: xydsc_5] Epoch [92/100] - Avg Loss: 0.0934

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Epoch 93/100: 100%|      | 570/570 [00:03<00:00, 177.54it/s]


[Feature Set: xydsc_5] Epoch [93/100] - Avg Loss: 0.0524

Epoch 94/100: 100%|      | 570/570 [00:03<00:00, 178.36it/s]


[Feature Set: xydsc_5] Epoch [94/100] - Avg Loss: 0.0519

Epoch 95/100: 100%|      | 570/570 [00:03<00:00, 178.99it/s]


[Feature Set: xydsc_5] Epoch [95/100] - Avg Loss: 0.0572

Epoch 96/100: 100%|      | 570/570 [00:03<00:00, 179.88it/s]


[Feature Set: xydsc_5] Epoch [96/100] - Avg Loss: 0.0772

Epoch 97/100: 100%|      | 570/570 [00:03<00:00, 180.04it/s]


[Feature Set: xydsc_5] Epoch [97/100] - Avg Loss: 0.0604

Epoch 98/100: 100%|      | 570/570 [00:03<00:00, 178.17it/s]


[Feature Set: xydsc_5] Epoch [98/100] - Avg Loss: 0.1045

Epoch 99/100: 100%|      | 570/570 [00:03<00:00, 179.15it/s]


[Feature Set: xydsc_5] Epoch [99/100] - Avg Loss: 0.0800

Epoch 100/100: 100%|      | 570/570 [00:03<00:00, 179.69it/s]


[Feature Set: xydsc_5] Epoch [100/100] - Avg Loss: 0.1193
[Eval] xydsc_5: 100%|      | 143/143 [00:00<00:00, 327.35it/s]
Epoch 1/100: 100%|      | 570/570 [00:03<00:00, 179.42it/s]


[Feature Set: xydi_3] Epoch [1/100] - Avg Loss: 0.6734

Epoch 2/100: 100%|      | 570/570 [00:03<00:00, 174.90it/s]


[Feature Set: xydi_3] Epoch [2/100] - Avg Loss: 0.6647

Epoch 3/100: 100%|      | 570/570 [00:03<00:00, 182.17it/s]


[Feature Set: xydi_3] Epoch [3/100] - Avg Loss: 0.6581

Epoch 4/100: 100%|      | 570/570 [00:03<00:00, 181.63it/s]
```

[Feature Set: xydi_3] Epoch [4/100] - Avg Loss: 0.6503
Epoch 5/100: 100%| | 570/570 [00:03<00:00, 175.67it/s]

[Feature Set: xydi_3] Epoch [5/100] - Avg Loss: 0.6425
Epoch 6/100: 100%| | 570/570 [00:03<00:00, 182.37it/s]

[Feature Set: xydi_3] Epoch [6/100] - Avg Loss: 0.6260
Epoch 7/100: 100%| | 570/570 [00:03<00:00, 183.13it/s]

[Feature Set: xydi_3] Epoch [7/100] - Avg Loss: 0.6040
Epoch 8/100: 100%| | 570/570 [00:03<00:00, 183.20it/s]

[Feature Set: xydi_3] Epoch [8/100] - Avg Loss: 0.5700
Epoch 9/100: 100%| | 570/570 [00:03<00:00, 181.82it/s]

[Feature Set: xydi_3] Epoch [9/100] - Avg Loss: 0.5549
Epoch 10/100: 100%| | 570/570 [00:03<00:00, 182.53it/s]

[Feature Set: xydi_3] Epoch [10/100] - Avg Loss: 0.5258
Epoch 11/100: 100%| | 570/570 [00:03<00:00, 182.66it/s]

[Feature Set: xydi_3] Epoch [11/100] - Avg Loss: 0.5184
Epoch 12/100: 100%| | 570/570 [00:03<00:00, 181.49it/s]

[Feature Set: xydi_3] Epoch [12/100] - Avg Loss: 0.4878
Epoch 13/100: 100%| | 570/570 [00:03<00:00, 182.73it/s]

[Feature Set: xydi_3] Epoch [13/100] - Avg Loss: 0.4806
Epoch 14/100: 100%| | 570/570 [00:03<00:00, 182.20it/s]

[Feature Set: xydi_3] Epoch [14/100] - Avg Loss: 0.4514
Epoch 15/100: 100%| | 570/570 [00:03<00:00, 183.47it/s]

[Feature Set: xydi_3] Epoch [15/100] - Avg Loss: 0.4241
Epoch 16/100: 100%| | 570/570 [00:03<00:00, 181.86it/s]

[Feature Set: xydi_3] Epoch [16/100] - Avg Loss: 0.4058

Epoch 17/100: 100%| | 570/570 [00:03<00:00, 183.43it/s]

[Feature Set: xydi_3] Epoch [17/100] - Avg Loss: 0.3819

Epoch 18/100: 100%| | 570/570 [00:03<00:00, 182.53it/s]

[Feature Set: xydi_3] Epoch [18/100] - Avg Loss: 0.3716

Epoch 19/100: 100%| | 570/570 [00:03<00:00, 172.88it/s]

[Feature Set: xydi_3] Epoch [19/100] - Avg Loss: 0.3689

Epoch 20/100: 100%| | 570/570 [00:03<00:00, 178.73it/s]

[Feature Set: xydi_3] Epoch [20/100] - Avg Loss: 0.3624

Epoch 21/100: 100%| | 570/570 [00:04<00:00, 138.27it/s]

[Feature Set: xydi_3] Epoch [21/100] - Avg Loss: 0.3669

Epoch 22/100: 100%| | 570/570 [00:03<00:00, 167.48it/s]

[Feature Set: xydi_3] Epoch [22/100] - Avg Loss: 0.3399

Epoch 23/100: 100%| | 570/570 [00:03<00:00, 175.85it/s]

[Feature Set: xydi_3] Epoch [23/100] - Avg Loss: 0.3057

Epoch 24/100: 100%| | 570/570 [00:03<00:00, 150.29it/s]

[Feature Set: xydi_3] Epoch [24/100] - Avg Loss: 0.3046

Epoch 25/100: 100%| | 570/570 [00:03<00:00, 157.20it/s]

[Feature Set: xydi_3] Epoch [25/100] - Avg Loss: 0.3090

Epoch 26/100: 100%| | 570/570 [00:03<00:00, 157.46it/s]

[Feature Set: xydi_3] Epoch [26/100] - Avg Loss: 0.2691

Epoch 27/100: 100%| | 570/570 [00:04<00:00, 130.45it/s]

[Feature Set: xydi_3] Epoch [27/100] - Avg Loss: 0.3016

Epoch 28/100: 100%| | 570/570 [00:03<00:00, 177.03it/s]

[Feature Set: xydi_3] Epoch [28/100] - Avg Loss: 0.3044

Epoch 29/100: 100%| | 570/570 [00:03<00:00, 180.34it/s]

[Feature Set: xydi_3] Epoch [29/100] - Avg Loss: 0.2737

Epoch 30/100: 100%| | 570/570 [00:03<00:00, 181.44it/s]

[Feature Set: xydi_3] Epoch [30/100] - Avg Loss: 0.2564

Epoch 31/100: 100%| | 570/570 [00:03<00:00, 182.43it/s]

[Feature Set: xydi_3] Epoch [31/100] - Avg Loss: 0.2532

Epoch 32/100: 100%| | 570/570 [00:03<00:00, 177.04it/s]

[Feature Set: xydi_3] Epoch [32/100] - Avg Loss: 0.2467

Epoch 33/100: 100%| | 570/570 [00:03<00:00, 182.72it/s]

[Feature Set: xydi_3] Epoch [33/100] - Avg Loss: 0.2323

Epoch 34/100: 100%| | 570/570 [00:03<00:00, 180.34it/s]

[Feature Set: xydi_3] Epoch [34/100] - Avg Loss: 0.2320

Epoch 35/100: 100%| | 570/570 [00:03<00:00, 172.21it/s]

[Feature Set: xydi_3] Epoch [35/100] - Avg Loss: 0.1850

Epoch 36/100: 100%| | 570/570 [00:03<00:00, 179.82it/s]

[Feature Set: xydi_3] Epoch [36/100] - Avg Loss: 0.2054

Epoch 37/100: 100%| | 570/570 [00:03<00:00, 177.99it/s]

[Feature Set: xydi_3] Epoch [37/100] - Avg Loss: 0.2208

Epoch 38/100: 100%| | 570/570 [00:03<00:00, 182.28it/s]

[Feature Set: xydi_3] Epoch [38/100] - Avg Loss: 0.2031

Epoch 39/100: 100%| | 570/570 [00:03<00:00, 181.34it/s]

[Feature Set: xydi_3] Epoch [39/100] - Avg Loss: 0.1841

Epoch 40/100: 100%| | 570/570 [00:03<00:00, 182.28it/s]

[Feature Set: xydi_3] Epoch [40/100] - Avg Loss: 0.2134
Epoch 41/100: 100%| | 570/570 [00:03<00:00, 180.43it/s]

[Feature Set: xydi_3] Epoch [41/100] - Avg Loss: 0.1791
Epoch 42/100: 100%| | 570/570 [00:03<00:00, 182.81it/s]

[Feature Set: xydi_3] Epoch [42/100] - Avg Loss: 0.1880
Epoch 43/100: 100%| | 570/570 [00:03<00:00, 182.07it/s]

[Feature Set: xydi_3] Epoch [43/100] - Avg Loss: 0.1677
Epoch 44/100: 100%| | 570/570 [00:03<00:00, 183.68it/s]

[Feature Set: xydi_3] Epoch [44/100] - Avg Loss: 0.1644
Epoch 45/100: 100%| | 570/570 [00:03<00:00, 183.09it/s]

[Feature Set: xydi_3] Epoch [45/100] - Avg Loss: 0.1357
Epoch 46/100: 100%| | 570/570 [00:03<00:00, 180.61it/s]

[Feature Set: xydi_3] Epoch [46/100] - Avg Loss: 0.2361
Epoch 47/100: 100%| | 570/570 [00:03<00:00, 182.60it/s]

[Feature Set: xydi_3] Epoch [47/100] - Avg Loss: 0.1445
Epoch 48/100: 100%| | 570/570 [00:03<00:00, 182.97it/s]

[Feature Set: xydi_3] Epoch [48/100] - Avg Loss: 0.1609
Epoch 49/100: 100%| | 570/570 [00:03<00:00, 182.53it/s]

[Feature Set: xydi_3] Epoch [49/100] - Avg Loss: 0.1412
Epoch 50/100: 100%| | 570/570 [00:03<00:00, 181.41it/s]

[Feature Set: xydi_3] Epoch [50/100] - Avg Loss: 0.1370
Epoch 51/100: 100%| | 570/570 [00:03<00:00, 183.01it/s]

[Feature Set: xydi_3] Epoch [51/100] - Avg Loss: 0.1208
Epoch 52/100: 100%| | 570/570 [00:03<00:00, 182.97it/s]

[Feature Set: xydi_3] Epoch [52/100] - Avg Loss: 0.1381

Epoch 53/100: 100%| | 570/570 [00:03<00:00, 184.03it/s]

[Feature Set: xydi_3] Epoch [53/100] - Avg Loss: 0.1108

Epoch 54/100: 100%| | 570/570 [00:03<00:00, 181.87it/s]

[Feature Set: xydi_3] Epoch [54/100] - Avg Loss: 0.1212

Epoch 55/100: 100%| | 570/570 [00:03<00:00, 183.45it/s]

[Feature Set: xydi_3] Epoch [55/100] - Avg Loss: 0.0908

Epoch 56/100: 100%| | 570/570 [00:03<00:00, 182.11it/s]

[Feature Set: xydi_3] Epoch [56/100] - Avg Loss: 0.1499

Epoch 57/100: 100%| | 570/570 [00:03<00:00, 180.35it/s]

[Feature Set: xydi_3] Epoch [57/100] - Avg Loss: 0.1001

Epoch 58/100: 100%| | 570/570 [00:03<00:00, 183.08it/s]

[Feature Set: xydi_3] Epoch [58/100] - Avg Loss: 0.0935

Epoch 59/100: 100%| | 570/570 [00:03<00:00, 181.42it/s]

[Feature Set: xydi_3] Epoch [59/100] - Avg Loss: 0.0850

Epoch 60/100: 100%| | 570/570 [00:03<00:00, 182.69it/s]

[Feature Set: xydi_3] Epoch [60/100] - Avg Loss: 0.1330

Epoch 61/100: 100%| | 570/570 [00:03<00:00, 181.21it/s]

[Feature Set: xydi_3] Epoch [61/100] - Avg Loss: 0.1146

Epoch 62/100: 100%| | 570/570 [00:03<00:00, 182.69it/s]

[Feature Set: xydi_3] Epoch [62/100] - Avg Loss: 0.0721

Epoch 63/100: 100%| | 570/570 [00:03<00:00, 182.54it/s]

[Feature Set: xydi_3] Epoch [63/100] - Avg Loss: 0.0793

Epoch 64/100: 100%| | 570/570 [00:03<00:00, 181.86it/s]

[Feature Set: xydi_3] Epoch [64/100] - Avg Loss: 0.1207
Epoch 65/100: 100%| | 570/570 [00:03<00:00, 183.19it/s]

[Feature Set: xydi_3] Epoch [65/100] - Avg Loss: 0.1161
Epoch 66/100: 100%| | 570/570 [00:03<00:00, 180.00it/s]

[Feature Set: xydi_3] Epoch [66/100] - Avg Loss: 0.0507
Epoch 67/100: 100%| | 570/570 [00:03<00:00, 182.73it/s]

[Feature Set: xydi_3] Epoch [67/100] - Avg Loss: 0.0563
Epoch 68/100: 100%| | 570/570 [00:03<00:00, 182.67it/s]

[Feature Set: xydi_3] Epoch [68/100] - Avg Loss: 0.0442
Epoch 69/100: 100%| | 570/570 [00:03<00:00, 181.06it/s]

[Feature Set: xydi_3] Epoch [69/100] - Avg Loss: 0.1514
Epoch 70/100: 100%| | 570/570 [00:03<00:00, 182.01it/s]

[Feature Set: xydi_3] Epoch [70/100] - Avg Loss: 0.0479
Epoch 71/100: 100%| | 570/570 [00:03<00:00, 182.76it/s]

[Feature Set: xydi_3] Epoch [71/100] - Avg Loss: 0.0396
Epoch 72/100: 100%| | 570/570 [00:03<00:00, 183.33it/s]

[Feature Set: xydi_3] Epoch [72/100] - Avg Loss: 0.0611
Epoch 73/100: 100%| | 570/570 [00:03<00:00, 182.30it/s]

[Feature Set: xydi_3] Epoch [73/100] - Avg Loss: 0.1271
Epoch 74/100: 100%| | 570/570 [00:03<00:00, 182.36it/s]

[Feature Set: xydi_3] Epoch [74/100] - Avg Loss: 0.0624
Epoch 75/100: 100%| | 570/570 [00:03<00:00, 183.17it/s]

[Feature Set: xydi_3] Epoch [75/100] - Avg Loss: 0.0537
Epoch 76/100: 100%| | 570/570 [00:03<00:00, 181.32it/s]

[Feature Set: xydi_3] Epoch [76/100] - Avg Loss: 0.0919

Epoch 77/100: 100%| | 570/570 [00:03<00:00, 182.87it/s]

[Feature Set: xydi_3] Epoch [77/100] - Avg Loss: 0.0569

Epoch 78/100: 100%| | 570/570 [00:03<00:00, 182.79it/s]

[Feature Set: xydi_3] Epoch [78/100] - Avg Loss: 0.0582

Epoch 79/100: 100%| | 570/570 [00:03<00:00, 182.19it/s]

[Feature Set: xydi_3] Epoch [79/100] - Avg Loss: 0.0464

Epoch 80/100: 100%| | 570/570 [00:03<00:00, 180.75it/s]

[Feature Set: xydi_3] Epoch [80/100] - Avg Loss: 0.0479

Epoch 81/100: 100%| | 570/570 [00:03<00:00, 182.60it/s]

[Feature Set: xydi_3] Epoch [81/100] - Avg Loss: 0.1320

Epoch 82/100: 100%| | 570/570 [00:03<00:00, 179.60it/s]

[Feature Set: xydi_3] Epoch [82/100] - Avg Loss: 0.0949

Epoch 83/100: 100%| | 570/570 [00:03<00:00, 181.80it/s]

[Feature Set: xydi_3] Epoch [83/100] - Avg Loss: 0.0645

Epoch 84/100: 100%| | 570/570 [00:03<00:00, 183.35it/s]

[Feature Set: xydi_3] Epoch [84/100] - Avg Loss: 0.0406

Epoch 85/100: 100%| | 570/570 [00:03<00:00, 183.11it/s]

[Feature Set: xydi_3] Epoch [85/100] - Avg Loss: 0.0530

Epoch 86/100: 100%| | 570/570 [00:03<00:00, 183.15it/s]

[Feature Set: xydi_3] Epoch [86/100] - Avg Loss: 0.0558

Epoch 87/100: 100%| | 570/570 [00:03<00:00, 181.04it/s]

[Feature Set: xydi_3] Epoch [87/100] - Avg Loss: 0.0992

Epoch 88/100: 100%| | 570/570 [00:03<00:00, 182.88it/s]

[Feature Set: xydi_3] Epoch [88/100] – Avg Loss: 0.0714

Epoch 89/100: 100%| | 570/570 [00:03<00:00, 182.36it/s]

[Feature Set: xydi_3] Epoch [89/100] – Avg Loss: 0.0511

Epoch 90/100: 100%| | 570/570 [00:03<00:00, 181.42it/s]

[Feature Set: xydi_3] Epoch [90/100] – Avg Loss: 0.0408

Epoch 91/100: 100%| | 570/570 [00:03<00:00, 182.31it/s]

[Feature Set: xydi_3] Epoch [91/100] – Avg Loss: 0.0765

Epoch 92/100: 100%| | 570/570 [00:03<00:00, 182.79it/s]

[Feature Set: xydi_3] Epoch [92/100] – Avg Loss: 0.1300

Epoch 93/100: 100%| | 570/570 [00:03<00:00, 182.93it/s]

[Feature Set: xydi_3] Epoch [93/100] – Avg Loss: 0.0451

Epoch 94/100: 100%| | 570/570 [00:03<00:00, 181.43it/s]

[Feature Set: xydi_3] Epoch [94/100] – Avg Loss: 0.0359

Epoch 95/100: 100%| | 570/570 [00:03<00:00, 183.18it/s]

[Feature Set: xydi_3] Epoch [95/100] – Avg Loss: 0.0404

Epoch 96/100: 100%| | 570/570 [00:03<00:00, 181.83it/s]

[Feature Set: xydi_3] Epoch [96/100] – Avg Loss: 0.0680

Epoch 97/100: 100%| | 570/570 [00:03<00:00, 181.78it/s]

[Feature Set: xydi_3] Epoch [97/100] – Avg Loss: 0.0469

Epoch 98/100: 100%| | 570/570 [00:03<00:00, 182.79it/s]

[Feature Set: xydi_3] Epoch [98/100] – Avg Loss: 0.1032

Epoch 99/100: 100%| | 570/570 [00:03<00:00, 181.42it/s]

[Feature Set: xydi_3] Epoch [99/100] – Avg Loss: 0.0304

Epoch 100/100: 100%| | 570/570 [00:03<00:00, 182.70it/s]

```
[Feature Set: xydi_3] Epoch [100/100] - Avg Loss: 0.0191

[Eval] xydi_3: 100%|          | 143/143 [00:00<00:00, 332.54it/s]
```

```
[3]: df_results = pd.DataFrame(results)
     print(df_results)
```

```
  Feature_Set  Accuracy  Macro_F1  Weighted_F1
0       xyd_3  0.552448  0.523928     0.570374
1      xysd_4  0.545455  0.514697     0.563396
2      xydd_4  0.587413  0.544266     0.600160
3     xydsc_5  0.573427  0.541016     0.589632
4      xydi_3  0.573427  0.541016     0.589632
```