Homework5

August 5, 2019

```
In [217]: # Author: Robert Guthrie
          # Modifications: Volodymyr Lut; lut@ucu.edu.ua

          import torch
          import torch.nn as nn
          import torch.nn.functional as F
          import torch.optim as optim
          from conllu import parse
          import numpy as np
          from tqdm import tqdm

          import tensorflow as tf

          import pandas as pd

          from statistics import harmonic_mean

          torch.manual_seed(1)

Out[217]: <torch._C.Generator at 0x1194c28b0>

In [17]: TEST_FILE_PATH = 'test.txt'
         TRAIN_FILE_PATH = 'train.txt'
         DEV_FILE_PATH = 'dev.txt'

In [138]: def parse_file_format(path):
              with open(path, 'r') as f:
                  data_raw= f.read()
              paragraphs = data_raw.split('\n\n')
              # drop empty lines
              paragraphs = [x for x in paragraphs if len(x) > 0]
              res = []
              for paragraph in paragraphs:
                  res.append([x.split() for x in paragraph.split('\n')])
              return res

In [139]: test = parse_file_format(TEST_FILE_PATH)
          test.pop(0)
          test[0]
```

```
Out[139]: [['SOCCER', 'NN', 'B-NP', 'O'],
          ['-', ':', 'O', 'O'],
          ['JAPAN', 'NNP', 'B-NP', 'B-LOC'],
          ['GET', 'VB', 'B-VP', 'O'],
          ['LUCKY', 'NNP', 'B-NP', 'O'],
          ['WIN', 'NNP', 'I-NP', 'O'],
          [',', ',', 'O', 'O'],
          ['CHINA', 'NNP', 'B-NP', 'B-PER'],
          ['IN', 'IN', 'B-PP', 'O'],
          ['SURPRISE', 'DT', 'B-NP', 'O'],
          ['DEFEAT', 'NN', 'I-NP', 'O'],
          ['.', '.', 'O', 'O']]

In [140]: train = parse_file_format(TRAIN_FILE_PATH)
          train.pop(0)

Out[140]: [['-DOCSTART-', '-X-', '-X-', 'O']]

In [141]: dev = parse_file_format(DEV_FILE_PATH)
          dev.pop(0)

Out[141]: [['-DOCSTART-', '-X-', '-X-', 'O']]

In [142]: def loadGloveModel(gloveFile):
              print("Loading Glove Model... ")
              f = open(gloveFile,'r')
              model = {}
              all_vectors = []
              for line in f:
                  splitLine = line.split()
                  word = splitLine[0]
                  embedding = np.array([float(val) for val in splitLine[1:]])
                  all_vectors.append(embedding)
                  model[word] = embedding
              print("Calculating average vector...")
              model['UNKNOWN'] = np.mean(all_vectors, axis=0)
              print("Done.",len(model)," words loaded!")

              return model

In [143]: # Wikipedia 2014 + Gigaword 5 word 2 vec pre-trained glove file downloaded from http.
          model = loadGloveModel('glove.6B.50d.txt')

Loading Glove Model...
Calculating average vector...
Done. 400001  words loaded!


In [144]: model['UNKNOWN']
```

```
Out[144]: array([-0.12920061, -0.28866239, -0.01224894, -0.05676689, -0.20211109,
                  -0.08389026,  0.33359737,  0.16045146,  0.03867495,  0.17833092,
                   0.0469662 , -0.00285779,  0.29099851,  0.04613723, -0.20923842,
                  -0.066131  , -0.06822448,  0.07665885,  0.31339918,  0.17848512,
                  -0.12257719, -0.09916928, -0.07495973,  0.06413206,  0.14441256,
                   0.608946  ,  0.17463101,  0.05335403, -0.01273826,  0.03474108,
                  -0.81239567, -0.04688727,  0.20193533,  0.20311115, -0.03935654,
                   0.06967518, -0.01553655, -0.03405275, -0.06528025,  0.12250092,
                   0.13992005, -0.17446305, -0.08011841,  0.08495219, -0.01041645,
                  -0.13704901,  0.20127088,  0.10069294,  0.00653007,  0.0168515 ])

In [145]: data = train + test + dev

In [146]: def calc_strat_1(x):
              try:
                  val = model[x]
              except:
                  val = model['UNKNOWN']
              return val
          strat_1 = [x + [calc_strat_1(x[0])] for paragraph in data for x in paragraph]
          strat_1[0]

Out[146]: ['EU',
           'NNP',
           'B-NP',
           'B-ORG',
           array([-0.12920061, -0.28866239, -0.01224894, -0.05676689, -0.20211109,
                  -0.08389026,  0.33359737,  0.16045146,  0.03867495,  0.17833092,
                   0.0469662 , -0.00285779,  0.29099851,  0.04613723, -0.20923842,
                  -0.066131  , -0.06822448,  0.07665885,  0.31339918,  0.17848512,
                  -0.12257719, -0.09916928, -0.07495973,  0.06413206,  0.14441256,
                   0.608946  ,  0.17463101,  0.05335403, -0.01273826,  0.03474108,
                  -0.81239567, -0.04688727,  0.20193533,  0.20311115, -0.03935654,
                   0.06967518, -0.01553655, -0.03405275, -0.06528025,  0.12250092,
                   0.13992005, -0.17446305, -0.08011841,  0.08495219, -0.01041645,
                  -0.13704901,  0.20127088,  0.10069294,  0.00653007,  0.0168515 ])]

In [147]: strat_2 = [x + [calc_strat_1(x[0].lower())] for paragraph in data for x in paragraph]

In [148]: def calc_strat_3(x):
              val = model['UNKNOWN']
              try:
                  val = model[x]
              except:
                  try:
                      val = model[x.lower()]
                  except:
                      val = model['UNKNOWN']
              return val
```

```
              strat_3 = [x + [calc_strat_3(x[0])] for paragraph in data for x in paragraph]

In [149]: def calculate_strat_general(data, strat = 1):
              if(strat != 1 and strat != 2 and strat != 3):
                  raise Exception('Invalid strat param')
              else:
                  if strat == 1:
                      return [x + [calc_strat_1(x[0])] for paragraph in data for x in paragraph
                  if strat == 2:
                      return [x + [calc_strat_1(x[0].lower())] for paragraph in data for x in p
                  if strat == 3:
                      return [x + [calc_strat_3(x[0])] for paragraph in data for x in paragraph

In [160]: def prepare_sequence(seq, to_ix, tags = False):
              i = 3 if tags else 0
              idxs = [to_ix[w[i]] for w in seq]
              return torch.tensor(idxs, dtype=torch.long)


          training_data = train

          word_to_ix = {}
          tag_to_ix = {}

          temp = [(x[0], x[3]) for paragraph in training_data for x in paragraph]

          for entry in tqdm(temp):
              word = entry[0]
              tag = entry[1]
              if word not in word_to_ix:
                  word_to_ix[word] = len(word_to_ix)
              if tag not in tag_to_ix:
                  tag_to_ix[tag] = len(tag_to_ix)

          # These will usually be more like 32 or 64 dimensional.
          # We will keep them small, so we can see how the weights change as we train.
          EMBEDDING_DIM = 32
          HIDDEN_DIM = 32

100%|| 204566/204566 [00:00<00:00, 807695.78it/s]


In [161]: class LSTMTagger(nn.Module):

              def __init__(self, embedding_dim, hidden_dim, vocab_size, tagset_size):
                  super(LSTMTagger, self).__init__()
                  self.hidden_dim = hidden_dim
```

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```
            self.word_embeddings = nn.Embedding(vocab_size, embedding_dim)

            # The LSTM takes word embeddings as inputs, and outputs hidden states
            # with dimensionality hidden_dim.
            self.lstm = nn.LSTM(embedding_dim, hidden_dim)

            # The linear layer that maps from hidden state space to tag space
            self.hidden2tag = nn.Linear(hidden_dim, tagset_size)

        def forward(self, sentence):
            embeds = self.word_embeddings(sentence)
            lstm_out, _ = self.lstm(embeds.view(len(sentence), 1, -1))
            tag_space = self.hidden2tag(lstm_out.view(len(sentence), -1))
            tag_scores = F.log_softmax(tag_space, dim=1)
            return tag_scores
```

In [222]:
```
def weighted_harmonic_mean(prec, rec, b):
    return (1 + b**2) * (prec * rec) / (((b**2 * prec) + rec) if prec > 0 or rec > 0
```

In [227]:
```
model = LSTMTagger(EMBEDDING_DIM, HIDDEN_DIM, len(word_to_ix), len(tag_to_ix))
loss_function = nn.NLLLoss()
optimizer = optim.SGD(model.parameters(), lr=0.1)

# See what the scores are before training
# Note that element i,j of the output is the score for tag j for word i.
# Here we don't need to train, so the code is wrapped in torch.no_grad()
with torch.no_grad():
    inputs = prepare_sequence(training_data[0], word_to_ix)
    tag_scores = model(inputs)
    print(tag_scores)

batch_size = 128
num_epochs = 5

batches = [training_data[x:x+batch_size] for x in range(0, len(tag_to_ix), batch_size

batches[0]
for epoch in range(num_epochs):  # again, normally you would NOT do 300 epochs, it i
    print("Epoch " + str(epoch))
    for batch in batches:
        for sentence in batch:
            # Step 1. Remember that Pytorch accumulates gradients.
            # We need to clear them out before each instance
            model.zero_grad()

            # Step 2. Get our inputs ready for the network, that is, turn them into
            # Tensors of word indices.
```

```python
            sentence_in = prepare_sequence(sentence, word_to_ix)
            targets = prepare_sequence(sentence, tag_to_ix, True)

            # Step 3. Run our forward pass.
            tag_scores = model(sentence_in)

            predicted = [int(np.argmax(tag_scores[i].clone().detach())) for i in rang
            actual = [tag_to_ix[x[3]] for x in sentence]

            tags_num = range(len(tag_to_ix))

            true_positives = len([1 for label in tags_num for (x, y) in zip(predicted
            false_positives = len([1 for label in tags_num for (x, y) in zip(predicte
            false_negatives = len([1 for label in tags_num for (x, y) in zip(predicte

            precision = (true_positives) / ((true_positives + false_positives) if tru
            recall = (true_positives) / ((true_positives + false_negatives) if true_p

            F1 = weighted_harmonic_mean(precision, recall, 1)
            F05 = weighted_harmonic_mean(precision, recall, 0.5)

            print("TP " + str(true_positives))
            print("FP " + str(false_positives))
            print("FN " + str(false_negatives))
            print("Precision " + str(precision))
            print("Recall " + str(recall))
            print("F1 " + str(F1))
            print("F0.5 " + str(F05))
            print("-----------------")
            # Step 4. Compute the loss, gradients, and update the parameters by
            #  calling optimizer.step()
            loss = loss_function(tag_scores, targets)
            # Uncomment if needed
            # print('Current batch loss: {}'.format(loss.item()))
            loss.backward()
            optimizer.step()

# # See what the scores are after training
with torch.no_grad():
    inputs = prepare_sequence(training_data[0], word_to_ix)
    tag_scores = model(inputs)
    # The sentence is "the dog ate the apple".  i,j corresponds to score for tag j
    # for word i. The predicted tag is the maximum scoring tag.
    # Here, we can see the predicted sequence below is 0 1 2 0 1
    # since 0 is index of the maximum value of row 1,
    # 1 is the index of maximum value of row 2, etc.
    # Which is DET NOUN VERB DET NOUN, the correct sequence!
    print(tag_scores)
```

```
tensor([[-2.2200, -2.2185, -2.3507, -1.9799, -2.3198, -2.3113, -2.2181, -2.0081,
         -2.2188],
        [-2.2103, -2.2594, -2.2221, -2.0354, -2.2930, -2.3396, -2.2231, -2.0391,
         -2.1968],
        [-2.3193, -2.1660, -2.3025, -2.0799, -2.3362, -2.2725, -2.3331, -1.9539,
         -2.0906],
        [-2.2414, -2.2289, -2.2562, -2.0633, -2.2877, -2.3157, -2.2847, -2.0148,
         -2.1294],
        [-2.3317, -2.1780, -2.3493, -2.0421, -2.3396, -2.1733, -2.3780, -2.0024,
         -2.0675],
        [-2.1848, -2.1752, -2.2542, -2.0731, -2.2462, -2.3082, -2.3503, -2.0367,
         -2.1881],
        [-2.2230, -2.1086, -2.2081, -2.1311, -2.1268, -2.1756, -2.4277, -2.0836,
         -2.3412],
        [-2.0954, -2.2086, -2.2659, -2.1650, -2.1842, -2.2595, -2.2787, -2.0571,
         -2.2884],
        [-2.2238, -2.1477, -2.3191, -2.0329, -2.3344, -2.2712, -2.2174, -2.0684,
         -2.2038]])
Epoch 0
TP 0
FP 9
FN 9
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 6
FP 24
FN 24
Precision 0.2
Recall 0.2
```

```
F1 0.20000000000000004
F0.5 0.20000000000000004
-----------------
TP 13
FP 18
FN 18
Precision 0.41935483870967744
Recall 0.41935483870967744
F1 0.41935483870967744
F0.5 0.4193548387096775
-----------------
TP 27
FP 6
FN 6
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 37
FP 3
FN 3
Precision 0.925
Recall 0.925
F1 0.925
F0.5 0.925
-----------------
TP 20
FP 8
FN 8
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 35
FP 2
FN 2
Precision 0.9459459459459459
Recall 0.9459459459459459
```

```
F1 0.9459459459459459
F0.5 0.9459459459459458
------------------
TP 21
FP 6
FN 6
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 25
FP 1
FN 1
Precision 0.9615384615384616
Recall 0.9615384615384616
F1 0.9615384615384616
F0.5 0.9615384615384616
------------------
TP 29
FP 1
FN 1
Precision 0.9666666666666667
Recall 0.9666666666666667
F1 0.9666666666666667
F0.5 0.9666666666666668
------------------
TP 31
FP 4
FN 4
Precision 0.8857142857142857
Recall 0.8857142857142857
```

```
F1 0.8857142857142857
F0.5 0.8857142857142857
-----------------
TP 27
FP 12
FN 12
Precision 0.6923076923076923
Recall 0.6923076923076923
F1 0.6923076923076923
F0.5 0.6923076923076922
-----------------
TP 32
FP 2
FN 2
Precision 0.9411764705882353
Recall 0.9411764705882353
F1 0.9411764705882353
F0.5 0.9411764705882354
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 15
FP 1
FN 1
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
```

```
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 32
FP 3
FN 3
Precision 0.9142857142857143
Recall 0.9142857142857143
F1 0.9142857142857143
F0.5 0.9142857142857143
-----------------
TP 28
FP 7
FN 7
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 27
FP 3
FN 3
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 31
FP 2
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
```

```
F1 0.9393939393939394
F0.5 0.9393939393939394
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
-----------------
TP 39
FP 8
FN 8
Precision 0.8297872340425532
Recall 0.8297872340425532
```

```
F1 0.8297872340425532
F0.5 0.8297872340425532
------------------
TP 29
FP 5
FN 5
Precision 0.8529411764705882
Recall 0.8529411764705882
F1 0.8529411764705882
F0.5 0.8529411764705882
------------------
TP 15
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 20
FP 4
FN 4
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 38
FP 6
FN 6
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 25
FP 5
FN 5
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
```

```
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 22
FP 2
FN 2
Precision 0.9166666666666666
Recall 0.9166666666666666
F1 0.9166666666666666
F0.5 0.9166666666666666
-----------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
```

```
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 22
FP 6
FN 6
Precision 0.7857142857142857
Recall 0.7857142857142857
F1 0.7857142857142857
F0.5 0.7857142857142857
-----------------
TP 19
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 21
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 28
FP 2
FN 2
Precision 0.9333333333333333
Recall 0.9333333333333333
```

```
F1 0.9333333333333333
F0.5 0.9333333333333333
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 17
FP 4
FN 4
Precision 0.8095238095238095
Recall 0.8095238095238095
F1 0.8095238095238095
F0.5 0.8095238095238096
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 15
FP 2
FN 2
Precision 0.8823529411764706
Recall 0.8823529411764706
F1 0.8823529411764706
F0.5 0.8823529411764705
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
```

```
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.888888888888888
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 24
FP 5
FN 5
Precision 0.8275862068965517
Recall 0.8275862068965517
F1 0.8275862068965517
F0.5 0.8275862068965516
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
```

```
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 9
FP 2
FN 2
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
------------------
TP 1
FP 2
FN 2
Precision 0.3333333333333333
Recall 0.333333333333333
```

```
F1 0.3333333333333333
F0.5 0.33333333333333337
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 4
FN 4
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
```

```
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
```

```
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 10
FP 3
FN 3
Precision 0.7692307692307693
Recall 0.7692307692307693
F1 0.7692307692307693
F0.5 0.7692307692307692
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
```

```
F1 0.875
F0.5 0.875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 4
FP 1
FN 1
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 5
FN 5
Precision 0.6875
Recall 0.6875
F1 0.6875
F0.5 0.6875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
```

```
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
```

```
F1 0.5
F0.5 0.5
-----------------
TP 12
FP 3
FN 3
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
```

```
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 22
FP 8
FN 8
Precision 0.7333333333333333
Recall 0.7333333333333333
F1 0.7333333333333333
F0.5 0.7333333333333332
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 15
FP 5
FN 5
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 22
FP 3
FN 3
Precision 0.88
Recall 0.88
```

```
F1 0.88
F0.5 0.8799999999999999
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 21
FP 4
FN 4
Precision 0.84
Recall 0.84
F1 0.8399999999999999
F0.5 0.8399999999999999
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 21
FP 9
FN 9
Precision 0.7
Recall 0.7
F1 0.7
F0.5 0.7
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
```

```
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 3
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 19
FP 1
FN 1
Precision 0.95
Recall 0.95
F1 0.9500000000000001
F0.5 0.9500000000000001
-----------------
TP 33
FP 2
FN 2
Precision 0.9428571428571428
Recall 0.9428571428571428
```

```
F1 0.9428571428571428
F0.5 0.942857142857143
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 5
FN 5
Precision 0.7058823529411765
Recall 0.7058823529411765
F1 0.7058823529411765
F0.5 0.7058823529411765
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
Epoch 1
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 0
FP 2
FN 2
Precision 0.0
```

```
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 4
FN 4
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 25
FP 6
FN 6
Precision 0.8064516129032258
Recall 0.8064516129032258
F1 0.8064516129032258
F0.5 0.8064516129032256
-----------------
TP 28
FP 5
FN 5
Precision 0.8484848484848485
Recall 0.8484848484848485
F1 0.8484848484848486
F0.5 0.8484848484848486
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 37
FP 3
FN 3
Precision 0.925
```

```
Recall 0.925
F1 0.925
F0.5 0.925
-----------------
TP 20
FP 8
FN 8
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 35
FP 2
FN 2
Precision 0.9459459459459459
Recall 0.9459459459459459
F1 0.9459459459459459
F0.5 0.9459459459459458
-----------------
TP 21
FP 6
FN 6
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 25
FP 1
FN 1
Precision 0.9615384615384616
```

```
Recall 0.9615384615384616
F1 0.9615384615384616
F0.5 0.9615384615384616
-----------------
TP 29
FP 1
FN 1
Precision 0.9666666666666667
Recall 0.9666666666666667
F1 0.9666666666666667
F0.5 0.9666666666666668
-----------------
TP 31
FP 4
FN 4
Precision 0.8857142857142857
Recall 0.8857142857142857
F1 0.8857142857142857
F0.5 0.8857142857142857
-----------------
TP 27
FP 12
FN 12
Precision 0.6923076923076923
Recall 0.6923076923076923
F1 0.6923076923076923
F0.5 0.6923076923076922
-----------------
TP 32
FP 2
FN 2
Precision 0.9411764705882353
Recall 0.9411764705882353
F1 0.9411764705882353
F0.5 0.9411764705882354
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 15
FP 1
FN 1
Precision 0.9375
```

```
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 32
FP 3
FN 3
Precision 0.9142857142857143
Recall 0.9142857142857143
F1 0.9142857142857143
F0.5 0.9142857142857143
-----------------
TP 28
FP 7
FN 7
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 30
FP 2
FN 2
Precision 0.9375
```

```
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 27
FP 3
FN 3
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 31
FP 2
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
F1 0.9393939393939394
F0.5 0.9393939393939394
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
```

```
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
-----------------
TP 39
FP 8
FN 8
Precision 0.8297872340425532
Recall 0.8297872340425532
F1 0.8297872340425532
F0.5 0.8297872340425532
-----------------
TP 29
FP 5
FN 5
Precision 0.8529411764705882
Recall 0.8529411764705882
F1 0.8529411764705882
F0.5 0.8529411764705882
-----------------
TP 15
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 20
FP 4
FN 4
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
-----------------
TP 38
FP 6
FN 6
Precision 0.8636363636363636
```

```
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 25
FP 5
FN 5
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 22
FP 2
FN 2
Precision 0.9166666666666666
Recall 0.9166666666666666
F1 0.9166666666666666
F0.5 0.9166666666666666
-----------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
```

```
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 22
FP 6
FN 6
Precision 0.7857142857142857
Recall 0.7857142857142857
F1 0.7857142857142857
F0.5 0.7857142857142857
-----------------
TP 19
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 21
FP 0
FN 0
Precision 1.0
```

```
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 28
FP 2
FN 2
Precision 0.9333333333333333
Recall 0.9333333333333333
F1 0.9333333333333333
F0.5 0.9333333333333333
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 17
FP 4
FN 4
Precision 0.8095238095238095
Recall 0.8095238095238095
F1 0.8095238095238095
F0.5 0.8095238095238096
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
```

```
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 15
FP 2
FN 2
Precision 0.8823529411764706
Recall 0.8823529411764706
F1 0.8823529411764706
F0.5 0.8823529411764705
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
```

```
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 24
FP 5
FN 5
Precision 0.8275862068965517
Recall 0.8275862068965517
F1 0.8275862068965517
F0.5 0.8275862068965516
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
```

```
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 9
FP 2
FN 2
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
-----------------
TP 1
FP 2
FN 2
Precision 0.3333333333333333
Recall 0.3333333333333333
F1 0.3333333333333333
F0.5 0.33333333333333337
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
```

```
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 4
FN 4
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
```

```
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 10
FP 3
FN 3
Precision 0.7692307692307693
Recall 0.7692307692307693
F1 0.7692307692307693
F0.5 0.7692307692307692
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
```

```
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 4
FP 1
FN 1
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 5
FN 5
Precision 0.6875
```

```
Recall 0.6875
F1 0.6875
F0.5 0.6875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
FN 0
Precision 1.0
```

```
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 12
FP 3
FN 3
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 0
FP 2
FN 2
Precision 0.0
```

```
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 22
FP 8
FN 8
Precision 0.7333333333333333
Recall 0.7333333333333333
F1 0.7333333333333333
F0.5 0.7333333333333332
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 8
FP 1
FN 1
Precision 0.888888888888888
```

```
Recall 0.8888888888888888
F1 0.888888888888888
F0.5 0.888888888888888
-----------------
TP 15
FP 5
FN 5
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 22
FP 3
FN 3
Precision 0.88
Recall 0.88
F1 0.88
F0.5 0.8799999999999999
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 21
FP 4
FN 4
Precision 0.84
Recall 0.84
F1 0.8399999999999999
F0.5 0.8399999999999999
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
```

```
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 21
FP 9
FN 9
Precision 0.7
Recall 0.7
F1 0.7
F0.5 0.7
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 3
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 0
FN 0
Precision 1.0
```

```
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 19
FP 1
FN 1
Precision 0.95
Recall 0.95
F1 0.9500000000000001
F0.5 0.9500000000000001
-----------------
TP 33
FP 2
FN 2
Precision 0.9428571428571428
Recall 0.9428571428571428
F1 0.9428571428571428
F0.5 0.942857142857143
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 5
FN 5
Precision 0.7058823529411765
Recall 0.7058823529411765
F1 0.7058823529411765
F0.5 0.7058823529411765
-----------------
TP 8
FP 0
FN 0
Precision 1.0
```

```
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
Epoch 2
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 4
FN 4
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 25
FP 6
FN 6
Precision 0.8064516129032258
Recall 0.8064516129032258
F1 0.8064516129032258
F0.5 0.8064516129032256
-----------------
TP 28
FP 5
FN 5
```

```
Precision 0.8484848484848485
Recall 0.8484848484848485
F1 0.8484848484848486
F0.5 0.8484848484848486
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 37
FP 3
FN 3
Precision 0.925
Recall 0.925
F1 0.925
F0.5 0.925
-----------------
TP 20
FP 8
FN 8
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 35
FP 2
FN 2
Precision 0.9459459459459459
Recall 0.9459459459459459
F1 0.9459459459459459
F0.5 0.9459459459459458
-----------------
TP 21
FP 6
FN 6
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 1
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 25
FP 1
FN 1
Precision 0.9615384615384616
Recall 0.9615384615384616
F1 0.9615384615384616
F0.5 0.9615384615384616
-----------------
TP 29
FP 1
FN 1
Precision 0.9666666666666667
Recall 0.9666666666666667
F1 0.9666666666666667
F0.5 0.9666666666666668
-----------------
TP 31
FP 4
FN 4
Precision 0.8857142857142857
Recall 0.8857142857142857
F1 0.8857142857142857
F0.5 0.8857142857142857
-----------------
TP 27
FP 12
FN 12
Precision 0.6923076923076923
Recall 0.6923076923076923
F1 0.6923076923076923
F0.5 0.6923076923076922
-----------------
TP 32
FP 2
FN 2
```

```
Precision 0.9411764705882353
Recall 0.9411764705882353
F1 0.9411764705882353
F0.5 0.9411764705882354
------------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
------------------
TP 15
FP 1
FN 1
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 32
FP 3
FN 3
```

```
Precision 0.9142857142857143
Recall 0.9142857142857143
F1 0.9142857142857143
F0.5 0.9142857142857143
------------------
TP 28
FP 7
FN 7
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
------------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 27
FP 3
FN 3
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 31
FP 2
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
F1 0.9393939393939394
F0.5 0.9393939393939394
------------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 1
FP 0
FN 0
```

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Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
-----------------
TP 39
FP 8
FN 8
Precision 0.8297872340425532
Recall 0.8297872340425532
F1 0.8297872340425532
F0.5 0.8297872340425532
-----------------
TP 29
FP 5
FN 5
Precision 0.8529411764705882
Recall 0.8529411764705882
F1 0.8529411764705882
F0.5 0.8529411764705882
-----------------
TP 15
FP 0
FN 0
```

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Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 20
FP 4
FN 4
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 38
FP 6
FN 6
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 25
FP 5
FN 5
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
```

```
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 22
FP 2
FN 2
Precision 0.9166666666666666
Recall 0.9166666666666666
F1 0.9166666666666666
F0.5 0.9166666666666666
------------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 22
FP 6
FN 6
```

```
Precision 0.7857142857142857
Recall 0.7857142857142857
F1 0.7857142857142857
F0.5 0.7857142857142857
-----------------
TP 19
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 21
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 28
FP 2
FN 2
Precision 0.9333333333333333
Recall 0.9333333333333333
F1 0.9333333333333333
F0.5 0.9333333333333333
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 13
FP 2
FN 2
```

```
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 17
FP 4
FN 4
Precision 0.8095238095238095
Recall 0.8095238095238095
F1 0.8095238095238095
F0.5 0.8095238095238096
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 15
FP 2
FN 2
Precision 0.8823529411764706
Recall 0.8823529411764706
F1 0.8823529411764706
F0.5 0.8823529411764705
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 1
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 24
FP 5
FN 5
Precision 0.8275862068965517
Recall 0.8275862068965517
F1 0.8275862068965517
F0.5 0.8275862068965516
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 1
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 9
FP 2
FN 2
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
-----------------
TP 1
FP 2
FN 2
Precision 0.3333333333333333
Recall 0.3333333333333333
F1 0.3333333333333333
F0.5 0.33333333333333337
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 8
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 4
FN 4
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.888888888888888
Recall 0.888888888888888
F1 0.888888888888888
F0.5 0.888888888888888
-----------------
TP 9
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 1
FP 1
FN 1
```

```
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 10
FP 3
FN 3
Precision 0.7692307692307693
Recall 0.7692307692307693
F1 0.7692307692307693
F0.5 0.7692307692307692
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 4
FP 1
FN 1
```

```
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 5
FN 5
Precision 0.6875
Recall 0.6875
F1 0.6875
F0.5 0.6875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 12
FP 3
FN 3
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
------------------
TP 1
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 22
FP 8
FN 8
Precision 0.7333333333333333
Recall 0.7333333333333333
F1 0.7333333333333333
F0.5 0.7333333333333332
-----------------
TP 12
FP 1
FN 1
```

```
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 8
FP 1
FN 1
Precision 0.888888888888888
Recall 0.888888888888888
F1 0.888888888888888
F0.5 0.888888888888888
------------------
TP 15
FP 5
FN 5
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 22
FP 3
FN 3
Precision 0.88
Recall 0.88
F1 0.88
F0.5 0.8799999999999999
------------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 21
FP 4
FN 4
```

```
Precision 0.84
Recall 0.84
F1 0.8399999999999999
F0.5 0.8399999999999999
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 21
FP 9
FN 9
Precision 0.7
Recall 0.7
F1 0.7
F0.5 0.7
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 1
FN 1
```

```
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 3
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 19
FP 1
FN 1
Precision 0.95
Recall 0.95
F1 0.9500000000000001
F0.5 0.9500000000000001
-----------------
TP 33
FP 2
FN 2
Precision 0.9428571428571428
Recall 0.9428571428571428
F1 0.9428571428571428
F0.5 0.942857142857143
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 7
FP 0
FN 0
```

```
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 5
FN 5
Precision 0.7058823529411765
Recall 0.7058823529411765
F1 0.7058823529411765
F0.5 0.7058823529411765
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
Epoch 3
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 4
```

```
FN 4
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
------------------
TP 25
FP 6
FN 6
Precision 0.8064516129032258
Recall 0.8064516129032258
F1 0.8064516129032258
F0.5 0.8064516129032256
------------------
TP 28
FP 5
FN 5
Precision 0.8484848484848485
Recall 0.8484848484848485
F1 0.8484848484848486
F0.5 0.8484848484848486
------------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
------------------
TP 37
FP 3
FN 3
Precision 0.925
Recall 0.925
F1 0.925
F0.5 0.925
------------------
TP 20
FP 8
FN 8
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 35
FP 2
```

```
FN 2
Precision 0.9459459459459459
Recall 0.9459459459459459
F1 0.9459459459459459
F0.5 0.9459459459459458
------------------
TP 21
FP 6
FN 6
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 25
FP 1
FN 1
Precision 0.9615384615384616
Recall 0.9615384615384616
F1 0.9615384615384616
F0.5 0.9615384615384616
------------------
TP 29
FP 1
FN 1
Precision 0.9666666666666667
Recall 0.9666666666666667
F1 0.9666666666666667
F0.5 0.9666666666666668
------------------
TP 31
FP 4
```

```
FN 4
Precision 0.8857142857142857
Recall 0.8857142857142857
F1 0.8857142857142857
F0.5 0.8857142857142857
------------------
TP 27
FP 12
FN 12
Precision 0.6923076923076923
Recall 0.6923076923076923
F1 0.6923076923076923
F0.5 0.6923076923076922
------------------
TP 32
FP 2
FN 2
Precision 0.9411764705882353
Recall 0.9411764705882353
F1 0.9411764705882353
F0.5 0.9411764705882354
------------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
------------------
TP 15
FP 1
FN 1
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 9
FP 1
```

```
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 2
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 32
FP 3
FN 3
Precision 0.9142857142857143
Recall 0.9142857142857143
F1 0.9142857142857143
F0.5 0.9142857142857143
------------------
TP 28
FP 7
FN 7
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
------------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 27
FP 3
FN 3
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 31
FP 2
```

```
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
F1 0.9393939393939394
F0.5 0.9393939393939394
------------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
------------------
TP 39
FP 8
```

```
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
F1 0.9393939393939394
F0.5 0.9393939393939394
------------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
------------------
TP 39
FP 8
```

```
FN 8
Precision 0.8297872340425532
Recall 0.8297872340425532
F1 0.8297872340425532
F0.5 0.8297872340425532
------------------
TP 29
FP 5
FN 5
Precision 0.8529411764705882
Recall 0.8529411764705882
F1 0.8529411764705882
F0.5 0.8529411764705882
------------------
TP 15
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 20
FP 4
FN 4
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 38
FP 6
FN 6
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 25
FP 5
FN 5
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 1
FP 0
```

```
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 22
FP 2
FN 2
Precision 0.9166666666666666
Recall 0.9166666666666666
F1 0.9166666666666666
F0.5 0.9166666666666666
------------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 10
FP 1
```

```
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 22
FP 6
FN 6
Precision 0.7857142857142857
Recall 0.7857142857142857
F1 0.7857142857142857
F0.5 0.7857142857142857
------------------
TP 19
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 21
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 28
FP 2
```

```
FN 2
Precision 0.9333333333333333
Recall 0.9333333333333333
F1 0.9333333333333333
F0.5 0.9333333333333333
------------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
------------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
------------------
TP 17
FP 4
FN 4
Precision 0.8095238095238095
Recall 0.8095238095238095
F1 0.8095238095238095
F0.5 0.8095238095238096
------------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
------------------
TP 15
FP 2
FN 2
Precision 0.8823529411764706
Recall 0.8823529411764706
F1 0.8823529411764706
F0.5 0.8823529411764705
------------------
TP 13
FP 1
```

```
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 8
FP 1
FN 1
Precision 0.888888888888888
Recall 0.888888888888888
F1 0.888888888888888
F0.5 0.888888888888888
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 24
FP 5
FN 5
Precision 0.8275862068965517
Recall 0.8275862068965517
F1 0.8275862068965517
F0.5 0.8275862068965516
-----------------
TP 19
FP 3
```

```
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 2
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 9
FP 2
FN 2
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
------------------
TP 1
FP 2
```

```
FN 2
Precision 0.3333333333333333
Recall 0.3333333333333333
F1 0.3333333333333333
F0.5 0.33333333333333337
------------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
------------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 10
FP 4
FN 4
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 9
FP 0
```

```
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
FP 0
```

```
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 8
FP 1
FN 1
Precision 0.888888888888888
Recall 0.888888888888888
F1 0.888888888888888
F0.5 0.888888888888888
------------------
TP 2
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 10
FP 3
FN 3
Precision 0.7692307692307693
Recall 0.7692307692307693
F1 0.7692307692307693
F0.5 0.7692307692307692
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 7
FP 1
```

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```
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 4
FP 1
FN 1
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
------------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 12
FP 4
FN 4
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 7
FP 2
```

```
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
------------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 4
FP 4
```

```
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 12
FP 3
FN 3
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
------------------
TP 0
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 23
FP 2
```

```
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
------------------
TP 22
FP 8
FN 8
Precision 0.7333333333333333
Recall 0.7333333333333333
F1 0.7333333333333333
F0.5 0.7333333333333332
------------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
------------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
------------------
TP 15
FP 5
FN 5
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 22
FP 3
```

```
FN 3
Precision 0.88
Recall 0.88
F1 0.88
F0.5 0.8799999999999999
------------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 21
FP 4
FN 4
Precision 0.84
Recall 0.84
F1 0.8399999999999999
F0.5 0.8399999999999999
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 32
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
------------------
TP 21
FP 9
FN 9
Precision 0.7
Recall 0.7
F1 0.7
F0.5 0.7
------------------
TP 19
FP 3
```

```
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 3
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 19
FP 1
FN 1
Precision 0.95
Recall 0.95
F1 0.9500000000000001
F0.5 0.9500000000000001
------------------
TP 33
FP 2
```

```
FN 2
Precision 0.9428571428571428
Recall 0.9428571428571428
F1 0.9428571428571428
F0.5 0.942857142857143
------------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 12
FP 5
FN 5
Precision 0.7058823529411765
Recall 0.7058823529411765
F1 0.7058823529411765
F0.5 0.7058823529411765
------------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
Epoch 4
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
------------------
TP 0
```

```
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 4
FN 4
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 25
FP 6
FN 6
Precision 0.8064516129032258
Recall 0.8064516129032258
F1 0.8064516129032258
F0.5 0.8064516129032256
-----------------
TP 28
FP 5
FN 5
Precision 0.8484848484848485
Recall 0.8484848484848485
F1 0.8484848484848486
F0.5 0.8484848484848486
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 37
```

```
FP 3
FN 3
Precision 0.925
Recall 0.925
F1 0.925
F0.5 0.925
-----------------
TP 20
FP 8
FN 8
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 35
FP 2
FN 2
Precision 0.9459459459459459
Recall 0.9459459459459459
F1 0.9459459459459459
F0.5 0.9459459459459458
-----------------
TP 21
FP 6
FN 6
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 25
```

```
FP 1
FN 1
Precision 0.9615384615384616
Recall 0.9615384615384616
F1 0.9615384615384616
F0.5 0.9615384615384616
-----------------
TP 29
FP 1
FN 1
Precision 0.9666666666666667
Recall 0.9666666666666667
F1 0.9666666666666667
F0.5 0.9666666666666668
-----------------
TP 31
FP 4
FN 4
Precision 0.8857142857142857
Recall 0.8857142857142857
F1 0.8857142857142857
F0.5 0.8857142857142857
-----------------
TP 27
FP 12
FN 12
Precision 0.6923076923076923
Recall 0.6923076923076923
F1 0.6923076923076923
F0.5 0.6923076923076922
-----------------
TP 32
FP 2
FN 2
Precision 0.9411764705882353
Recall 0.9411764705882353
F1 0.9411764705882353
F0.5 0.9411764705882354
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 15
```

```
FP 1
FN 1
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 2
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 32
FP 3
FN 3
Precision 0.9142857142857143
Recall 0.9142857142857143
F1 0.9142857142857143
F0.5 0.9142857142857143
-----------------
TP 28
FP 7
FN 7
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 30
```

```
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 27
FP 3
FN 3
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 31
FP 2
FN 2
Precision 0.9393939393939394
Recall 0.9393939393939394
F1 0.9393939393939394
F0.5 0.9393939393939394
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 1
```

```
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 26
FP 9
FN 9
Precision 0.7428571428571429
Recall 0.7428571428571429
F1 0.7428571428571429
F0.5 0.7428571428571429
-----------------
TP 39
FP 8
FN 8
Precision 0.8297872340425532
Recall 0.8297872340425532
F1 0.8297872340425532
F0.5 0.8297872340425532
-----------------
TP 29
FP 5
FN 5
Precision 0.8529411764705882
Recall 0.8529411764705882
F1 0.8529411764705882
F0.5 0.8529411764705882
-----------------
TP 15
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 20
FP 4
FN 4
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
-----------------
TP 38
```

```
FP 6
FN 6
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
------------------
TP 25
FP 5
FN 5
Precision 0.8333333333333334
Recall 0.8333333333333334
F1 0.8333333333333334
F0.5 0.8333333333333334
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
------------------
TP 22
FP 2
FN 2
Precision 0.9166666666666666
Recall 0.9166666666666666
F1 0.9166666666666666
F0.5 0.9166666666666666
------------------
TP 32
```

```
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 22
FP 6
FN 6
Precision 0.7857142857142857
Recall 0.7857142857142857
F1 0.7857142857142857
F0.5 0.7857142857142857
-----------------
TP 19
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 21
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 28
FP 2
FN 2
Precision 0.9333333333333333
Recall 0.9333333333333333
F1 0.9333333333333333
F0.5 0.9333333333333333
-----------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
-----------------
TP 13
FP 2
FN 2
Precision 0.8666666666666667
Recall 0.8666666666666667
F1 0.8666666666666667
F0.5 0.8666666666666667
-----------------
TP 17
FP 4
FN 4
Precision 0.8095238095238095
Recall 0.8095238095238095
F1 0.8095238095238095
F0.5 0.8095238095238096
-----------------
TP 10
```

```
FP 1
FN 1
Precision 0.9090909090909091
Recall 0.9090909090909091
F1 0.9090909090909091
F0.5 0.9090909090909091
------------------
TP 15
FP 2
FN 2
Precision 0.8823529411764706
Recall 0.8823529411764706
F1 0.8823529411764706
F0.5 0.8823529411764705
------------------
TP 13
FP 1
FN 1
Precision 0.9285714285714286
Recall 0.9285714285714286
F1 0.9285714285714286
F0.5 0.9285714285714286
------------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
------------------
TP 1
```

```
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 24
FP 5
FN 5
Precision 0.8275862068965517
Recall 0.8275862068965517
F1 0.8275862068965517
F0.5 0.8275862068965516
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 2
FN 2
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 2
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 9
FP 2
FN 2
Precision 0.8181818181818182
Recall 0.8181818181818182
F1 0.8181818181818182
F0.5 0.8181818181818183
-----------------
TP 1
FP 2
FN 2
Precision 0.3333333333333333
Recall 0.3333333333333333
F1 0.3333333333333333
F0.5 0.33333333333333337
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 10
FP 4
FN 4
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
-----------------
TP 9
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
```

```
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
------------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 8
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
------------------
TP 2
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 10
FP 3
FN 3
Precision 0.7692307692307693
Recall 0.7692307692307693
F1 0.7692307692307693
F0.5 0.7692307692307692
------------------
TP 6
```

```
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 1
FN 1
Precision 0.875
Recall 0.875
F1 0.875
F0.5 0.875
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 4
FP 1
FN 1
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
```

```
FP 4
FN 4
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
-----------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 11
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 5
FP 2
FN 2
Precision 0.7142857142857143
Recall 0.7142857142857143
F1 0.7142857142857143
F0.5 0.7142857142857142
-----------------
TP 1
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 6
FP 3
FN 3
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 4
FP 4
FN 4
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 12
FP 3
FN 3
Precision 0.8
Recall 0.8
F1 0.8000000000000002
F0.5 0.8000000000000002
-----------------
TP 1
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 7
FP 2
FN 2
Precision 0.7777777777777778
Recall 0.7777777777777778
F1 0.7777777777777778
F0.5 0.7777777777777778
-----------------
TP 0
```

```
FP 2
FN 2
Precision 0.0
Recall 0.0
F1 0.0
F0.5 0.0
-----------------
TP 1
FP 1
FN 1
Precision 0.5
Recall 0.5
F1 0.5
F0.5 0.5
-----------------
TP 23
FP 2
FN 2
Precision 0.92
Recall 0.92
F1 0.92
F0.5 0.9199999999999999
-----------------
TP 22
FP 8
FN 8
Precision 0.7333333333333333
Recall 0.7333333333333333
F1 0.7333333333333333
F0.5 0.7333333333333332
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 30
FP 2
FN 2
Precision 0.9375
Recall 0.9375
F1 0.9375
F0.5 0.9375
-----------------
TP 8
```

```
FP 1
FN 1
Precision 0.8888888888888888
Recall 0.8888888888888888
F1 0.8888888888888888
F0.5 0.8888888888888888
------------------
TP 15
FP 5
FN 5
Precision 0.75
Recall 0.75
F1 0.75
F0.5 0.75
------------------
TP 22
FP 3
FN 3
Precision 0.88
Recall 0.88
F1 0.88
F0.5 0.8799999999999999
------------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
------------------
TP 21
FP 4
FN 4
Precision 0.84
Recall 0.84
F1 0.8399999999999999
F0.5 0.8399999999999999
------------------
TP 10
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
------------------
TP 32
```

```
FP 10
FN 10
Precision 0.7619047619047619
Recall 0.7619047619047619
F1 0.7619047619047619
F0.5 0.7619047619047619
-----------------
TP 20
FP 10
FN 10
Precision 0.6666666666666666
Recall 0.6666666666666666
F1 0.6666666666666666
F0.5 0.6666666666666667
-----------------
TP 19
FP 3
FN 3
Precision 0.8636363636363636
Recall 0.8636363636363636
F1 0.8636363636363636
F0.5 0.8636363636363636
-----------------
TP 12
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 1
FN 1
Precision 0.9230769230769231
Recall 0.9230769230769231
F1 0.9230769230769231
F0.5 0.9230769230769231
-----------------
TP 3
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 11
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 19
FP 1
FN 1
Precision 0.95
Recall 0.95
F1 0.9500000000000001
F0.5 0.9500000000000001
-----------------
TP 33
FP 2
FN 2
Precision 0.9428571428571428
Recall 0.9428571428571428
F1 0.9428571428571428
F0.5 0.942857142857143
-----------------
TP 9
FP 1
FN 1
Precision 0.9
Recall 0.9
F1 0.9
F0.5 0.9000000000000001
-----------------
TP 7
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
TP 12
FP 5
FN 5
Precision 0.7058823529411765
Recall 0.7058823529411765
F1 0.7058823529411765
F0.5 0.7058823529411765
-----------------
TP 8
```

```
FP 0
FN 0
Precision 1.0
Recall 1.0
F1 1.0
F0.5 1.0
-----------------
tensor([[-3.1029e+00, -3.8726e-01, -3.6464e+00, -3.3902e+00, -3.7830e+00,
         -1.9987e+00, -3.4391e+00, -4.3133e+00, -4.3714e+00],
        [-3.0480e+00, -6.0559e-01, -3.4867e+00, -3.3888e+00, -3.7268e+00,
         -1.3547e+00, -3.3415e+00, -4.4570e+00, -4.3152e+00],
        [-4.0010e+00, -1.4936e-01, -4.0503e+00, -4.1930e+00, -4.4909e+00,
         -3.0108e+00, -4.1199e+00, -5.1400e+00, -5.2290e+00],
        [-4.3824e+00, -9.2024e-02, -4.6002e+00, -4.7331e+00, -4.7900e+00,
         -3.5045e+00, -4.4235e+00, -5.7367e+00, -5.8161e+00],
        [-5.2645e+00, -3.9816e-02, -5.3672e+00, -5.5046e+00, -5.5767e+00,
         -4.3926e+00, -5.1065e+00, -6.4741e+00, -6.5906e+00],
        [-6.1216e+00, -1.6479e-02, -5.9331e+00, -6.4206e+00, -6.5134e+00,
         -5.3412e+00, -5.9948e+00, -7.4127e+00, -7.5965e+00],
        [-4.7153e+00, -6.4578e-02, -4.4999e+00, -4.9866e+00, -4.9759e+00,
         -4.0293e+00, -4.9705e+00, -6.1422e+00, -6.2859e+00],
        [-5.6286e+00, -2.3414e-02, -5.7592e+00, -6.1398e+00, -6.0744e+00,
         -4.9181e+00, -5.6939e+00, -7.2617e+00, -7.4940e+00],
        [-6.8815e+00, -7.7524e-03, -6.7687e+00, -7.2602e+00, -7.2101e+00,
         -6.0618e+00, -6.5924e+00, -8.4275e+00, -8.5958e+00]])
```