Happiness narratives

Data Discrepancies

There's more data used for the hedometer evaluation than there is for the ml training and evaluation.

The stats

The Hedometer data has 3656 entries The ML data has 3343 enttries.

The preprocessing done on the hedometer data makes it difficult to compare the two files.

Lowercasing, all punctuation removed, spaced injeted.

Results

SVR Joy

```
MSE: 0.9964795758847595

Mean Absolute Error 0.8209001542496819

R2: -0.0969678363700448

Pearson correlation: (0.1630455970822213, 3.789529650766423e-23)0 values were squeezed into
the score range
0 values were squeezed into the score range               precision    recall  f1-score
support

          1  0.00000000 0.00000000 0.00000000       288           2  0.32646048 0.21517554
0.25938567        883

          3  0.32398754 0.64148034 0.43053040      1297           4  0.40041494 0.19108911
0.25871314       1010

          5  0.00000000 0.00000000 0.00000000       169

    accuracy                          0.33315053      3647   macro avg  0.21017259 0.20954900
0.18972584       3647

weighted avg  0.30515370 0.33315053 0.28756121       3647

[[  0  36 234  18   0]
 [  5 190 640  48   0]
 [  2 251 832 208   4]
 [  0  93 720 193   4]
 [  0  12 142  15   0]]

ROC - AUC : 0.5053219775610537
```

SVM Joy

```
MSE: 0.6431352807865082

Mean Absolute Error 0.6158711064947314

R2: 0.2920088534366445

Pearson correlation: (0.5917811508024919, 0.0)

0 values were squeezed into the score range0 values were squeezed into the score
range

          precision    recall  f1-score    support

       1  0.38461538 0.06944444 0.11764706       288         2  0.47463360 0.47678369
0.47570621      883

       3  0.49695122 0.62837317 0.55498808      1297         4  0.52855760 0.54059406
0.53450808      1010

       5  0.37142857 0.07692308 0.12745098       169

   accuracy                     0.49766932      3647   macro avg  0.45123727 0.35842369
0.36206008      3647

weighted avg  0.48561312 0.49766932 0.47577265       3647

[[ 20 172  80  16   0]
 [ 25 421 346  91   0]
 [  6 229 815 246   1]
 [  1  62 380 546  21]
 [  0   3  19 134  13]]

ROC - AUC : 0.6071926695107926
```

Lasso Joy

```
MSE: 1.0281566480572382

Mean Absolute Error 0.8358763189438444

R2: -0.1318393281341672

Pearson correlation: (0.14760188286173698, 3.252804550962394e-19)3 values were squeezed into
the score range

0 values were squeezed into the score range          precision    recall  f1-score
support

           1  0.10000000 0.00347222 0.00671141      288          2  0.30782030 0.20951302
0.24932615       883

           3  0.32254244 0.62991519 0.42663185     1297          4  0.42738589 0.20396040
0.27613941      1010

           5  0.04761905 0.00591716 0.01052632      169

    accuracy                        0.33177954     3647   macro avg  0.24107354 0.21055560
0.19386703      3647

weighted avg  0.31769954 0.33177954 0.28958298      3647

[[  1  26 247  14   0]
 [  4 185 641  52   1]
 [  5 270 817 196   9]
 [  0 105 689 206  10]
 [  0  15 139  14   1]]
ROC - AUC : 0.5058964520950757
```

Lasso Sadness

```
SE: 0.9307384965022848

Mean Absolute Error 0.7960851914177507

R2: -0.04084814009093862

Pearson correlation: (0.23080343775556006, 3.2202046350021302e-46)20 values were squeezed

into the score range

0 values were squeezed into the score range           precision    recall  f1-score

support

        1  0.00000000 0.00000000 0.00000000      146          2  0.06217617 0.01826484

0.02823529     657

        3  0.33868243 0.64677419 0.44456763     1240          4  0.46069470 0.38858905

0.42158093     1297

        5  0.00000000 0.00000000 0.00000000      384

   accuracy                       0.35392052     3724   macro avg  0.17231066 0.21072562

0.17887677     3724

weighted avg  0.28419360 0.35392052 0.29984020      3724

[[  0    2 125   19    0]

 [  1   12 551   92    1]

 [  3 136 802 281   18]

 [  1   41 706 504   45]

 [  0    2 184 198    0]]

ROC - AUC : 0.5100520397496775

.............................................
```

SVR Sadness

```
SE: 0.9454209231533085

Mean Absolute Error 0.8007222131105772

R2: -0.05726754954823532

Pearson correlation: (0.191833119260266, 3.3651319183614605e-32)1 values were squeezed into
the score range0 values were squeezed into the score range
/home/kenneth/venvs/crfsuite/lib/python3.8/site-
packages/sklearn/metrics/_classification.py:1272: UndefinedMetricWarning: Precision and F-
score are ill-defined and being set to 0.0 in labels with no predicted samples. Use
`zero_division` parameter to control this behavior.  _warn_prf(average, modifier, msg_start,
len(result))
           precision    recall  f1-score   support
         1  0.00000000 0.00000000 0.00000000      146         2  0.06111111 0.01674277
0.02628435      657
         3  0.32739130 0.60725806 0.42542373     1240         4  0.41384996 0.38704703
0.40000000     1297
         5  0.00000000 0.00000000 0.00000000      384
    accuracy                     0.33995704     3724   macro avg  0.16047047 0.20220957
0.17034162      3724
weighted avg  0.26393088 0.33995704 0.28560533      3724
[[  0    4 111   31    0]
 [  0  11 497 148    1]
 [  0 136 753 342    9]
 [  0  27 747 502   21]
 [  0    2 192 190    0]]
ROC - AUC : 0.5030923629109962
```

SVM Sadness

```
MSE: 0.6640974977269949

Mean Absolute Error 0.6386105570026086

R2: 0.2573374283476926

Pearson correlation: (0.5643611440598052, 2.75759376237e-312)0 values were squeezed into the
score range

0 values were squeezed into the score range            precision    recall  f1-score
support

        1  0.14285714 0.00684932 0.01307190     146          2  0.42553191 0.30441400
0.35492458       657

        3  0.43119266 0.53064516 0.47577730     1240          4  0.48706625 0.59521974
0.53573907      1297

        5  0.41176471 0.14583333 0.21538462     384

    accuracy                        0.45300752     3724   macro avg  0.37968253 0.31659231
0.31897949      3724

weighted avg  0.43634615 0.45300752 0.43034883      3724
[[  1  56  73  16   0]
 [  5 200 365  86   1]
 [  1 162 658 414   5]
 [  0  45 406 772  74]
 [  0   7  24 297  56]]
ROC - AUC : 0.578488077944395
```

Correlation

Binyan was doing pearson's correlation. Thinks maybe we should do spearman

Neural Networks

RELU unscaled results

Joy train on 9 folds, test on 1

```
2020-05-13 12:15:50,734 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 12,
  "peak_cpu_memory_MB": 2626.072,
  "peak_gpu_0_memory_MB": 8085,
  "peak_gpu_1_memory_MB": 21478,
  "training_duration": "0:23:41.867688",
  "training_start_epoch": 0,
  "training_epochs": 21,
  "epoch": 21,
  "training_pearson": 0.9939782728494088,
  "training_mae": 0.14345509548909208,
  "training_loss": 0.03389307007519076,
  "training_cpu_memory_MB": 2626.072,
  "training_gpu_0_memory_MB": 7409,
  "training_gpu_1_memory_MB": 18680,
  "validation_pearson": 0.8524911266953036,
  "validation_mae": 0.7244842611554498,
  "validation_loss": 0.8840915312369665,
  "best_validation_pearson": 0.8559774687113151,
  "best_validation_mae": 0.6610433984638224,
  "best_validation_loss": 0.7440112556020418
}
```

Sadness train on 9 folds,

test on 1

These are longer and they're causing clipping. I don't know how many are causing clipping though because allennlp only reports the first case of clipping.

```
2020-05-13 12:22:49,449 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 1,
  "peak_cpu_memory_MB": 2759.188,
  "peak_gpu_0_memory_MB": 7409,
  "peak_gpu_1_memory_MB": 18680,
  "training_duration": "0:17:02.438299",
  "training_start_epoch": 0,
  "training_epochs": 10,
  "epoch": 10,
  "training_pearson": -0.01633020200422353,
  "training_mae": 1.3776687749682646,
  "training_loss": 2.781699788029837,
  "training_cpu_memory_MB": 2759.188,
  "training_gpu_0_memory_MB": 7409,
  "training_gpu_1_memory_MB": 11,
  "validation_pearson": 0,
  "validation_mae": 1.355329878786777,
  "validation_loss": 2.7624370823515223,
  "best_validation_pearson": 0.23847302176509885,  "best_validation_mae":
1.3548242284896526,
  "best_validation_loss": 2.7604094781774156
}
```

Linear Unscaled results

Joy

lr = 0.001

Really bad, mean absolute error of 1.3ish at the end.

lr = 0.0001

Seemed to overfit, learning rate continued to decrease. for training but not validation.

```
2020-05-14 18:53:12,495 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 11,
  "peak_cpu_memory_MB": 2630.66,
  "peak_gpu_0_memory_MB": 1,
  "peak_gpu_1_memory_MB": 21478,
  "training_duration": "0:23:01.688213",
  "training_start_epoch": 0,
  "training_epochs": 20,
  "epoch": 20,
  "training_pearson": 0.9952644629823881,
  "training_mae": 0.12786512176923553,
  "training_loss": 0.02625432804009868,
  "training_cpu_memory_MB": 2630.66,
  "training_gpu_0_memory_MB": 1,
  "training_gpu_1_memory_MB": 18680,
  "validation_pearson": 0.8548239304162555,
```

```
    "validation_mae": 0.6628524492371757,

    "validation_loss": 0.7741623421510061,

    "best_validation_pearson": 0.8563759958887212,

    "best_validation_mae": 0.6515413680166569,

    "best_validation_loss": 0.7303319076697031

}
```

lr = 0.00001

```
2020-05-14 21:39:30,893 - INFO - allennlp.common.util - Metrics: {
    "best_epoch": 2,

    "peak_cpu_memory_MB": 2627.62,

    "peak_gpu_0_memory_MB": 1,

    "peak_gpu_1_memory_MB": 21478,

    "training_duration": "0:13:09.258866",

    "training_start_epoch": 0,

    "training_epochs": 11,

    "epoch": 11,

    "training_pearson": 0.9709087494155519,

    "training_mae": 0.31317798209277703,

    "training_loss": 0.15988704243909965,

    "training_cpu_memory_MB": 2627.62,

    "training_gpu_0_memory_MB": 1,

    "training_gpu_1_memory_MB": 18094,

    "validation_pearson": 0.8498408919748213,

    "validation_mae": 0.721538697934215,

    "validation_loss": 0.8732728213071823,

    "best_validation_pearson": 0.8493931180602585,

    "best_validation_mae": 0.6772722928029187,

    "best_validation_loss": 0.7859473476807276

}
```

RNN scaled results

3 hid

lr 0.00001

```
2020-05-14 22:57:02,171 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 28,
  "peak_cpu_memory_MB": 1997.92,
  "peak_gpu_0_memory_MB": 2697,
  "peak_gpu_1_memory_MB": 11,
  "training_duration": "0:06:15.555519",
  "training_start_epoch": 0,
  "training_epochs": 37,
  "epoch": 37,
  "training_pearson": 0.8835897766720373,
  "training_mae": 0.6050379267542354,
  "training_loss": 0.012446582688072931,
  "training_cpu_memory_MB": 1997.892,
  "training_gpu_0_memory_MB": 2697,
  "training_gpu_1_memory_MB": 11,
  "validation_pearson": 0.7651979545423095,
  "validation_mae": 0.854339599609375,
  "validation_loss": 0.02388349245302379,
  "best_validation_pearson": 0.763310168046131,
  "best_validation_mae": 0.8508703021026365,
  "best_validation_loss": 0.023334396770223975
}
```

lr 0.0001

```
2020-05-14 23:00:13,281 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 3,
  "peak_cpu_memory_MB": 1984.856,
  "peak_gpu_0_memory_MB": 2437,
  "peak_gpu_1_memory_MB": 11,
  "training_duration": "0:02:09.181165",
  "training_start_epoch": 0,
  "training_epochs": 12,
  "epoch": 12,
  "training_pearson": 0.9309341933147448,
  "training_mae": 0.4662433107257326,
  "training_loss": 0.007578380315483195,
  "training_cpu_memory_MB": 1984.816,
  "training_gpu_0_memory_MB": 2437,
  "training_gpu_1_memory_MB": 11,
  "validation_pearson": 0.7313824688523022,
  "validation_mae": 0.8880522283261034,
  "validation_loss": 0.028224910454203684,
  "best_validation_pearson": 0.7701748503103649,
  "best_validation_mae": 0.8408898201914168,
  "best_validation_loss": 0.022758180275559425
}
```

2 hid

RNN unscaled results

Glove embeddings

64 dimensional RNN

1 hidden layer

2 hidden layers

0.0001 lr

```
2020-05-19 23:19:25,110 - INFO - allennlp.common.util - Metrics: {
  "best_epoch": 35,
  "peak_cpu_memory_MB": 1715.32,
  "peak_gpu_0_memory_MB": 1,
  "peak_gpu_1_memory_MB": 636,
  "training_duration": "0:01:44.572271",
  "training_start_epoch": 0,
  "training_epochs": 44,
  "epoch": 44,
  "training_pearson": 0.8755669240062097,
  "training_mae": 0.6300580370557177,
  "training_loss": 0.6342626507793154,
```

```
    "training_cpu_memory_MB": 1715.3,

    "training_gpu_0_memory_MB": 1,

    "training_gpu_1_memory_MB": 636,

    "validation_pearson": 0.7133927439166854,

    "validation_mae": 0.913505204604321,

    "validation_loss": 1.405275821685791,

    "best_validation_pearson": 0.7112064102524507,

    "best_validation_mae": 0.9231068901617251,

    "best_validation_loss": 1.3673358609278996

 }
```

3 hidden layers

Meeting Notes

5-13

Variety of different conferences and journals we could submit to.

Digital Scholarship in the Humanities is a DH journal we could submit to.