# PART 2: Words as features

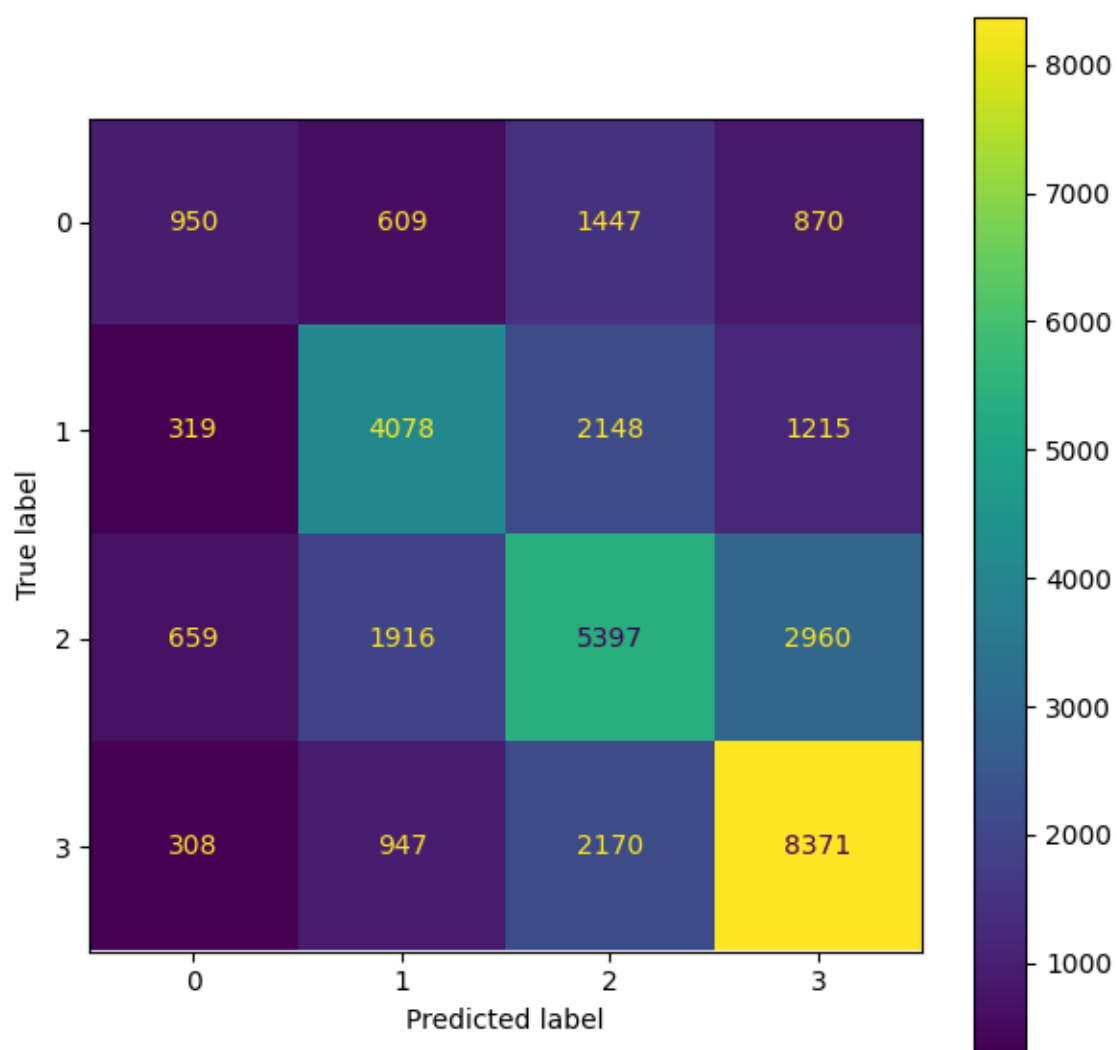## 2.3.1 The performance of Multinomial naive bayes classifier with default parameters for emotions.

	precision	recall	f1-score	support
admiration	0.47	0.44	0.46	2129
amusement	0.55	0.32	0.40	1221
anger	0.32	0.11	0.16	965
annoyance	0.18	0.07	0.10	1634
approval	0.25	0.09	0.13	2300
caring	0.31	0.06	0.10	722
confusion	0.26	0.05	0.08	1015
curiosity	0.40	0.10	0.16	1169
desire	0.44	0.04	0.07	422
disappointment	0.27	0.04	0.07	992
disapproval	0.23	0.08	0.11	1552
disgust	0.46	0.08	0.13	607
embarrassment	0.33	0.01	0.02	319
excitement	0.27	0.04	0.07	583
fear	0.39	0.03	0.06	355
gratitude	0.73	0.69	0.71	1413
grief	0.00	0.00	0.00	49
joy	0.35	0.11	0.17	869
love	0.63	0.37	0.46	916
nervousness	0.00	0.00	0.00	175
neutral	0.36	0.84	0.50	10932
optimism	0.46	0.14	0.22	923
pride	0.00	0.00	0.00	137
realization	0.24	0.03	0.05	991
relief	0.00	0.00	0.00	161
remorse	0.53	0.05	0.10	310
sadness	0.44	0.08	0.14	802
surprise	0.39	0.08	0.13	701
accuracy			0.38	34364
macro avg	0.33	0.14	0.16	34364
weighted avg	0.37	0.38	0.30	34364
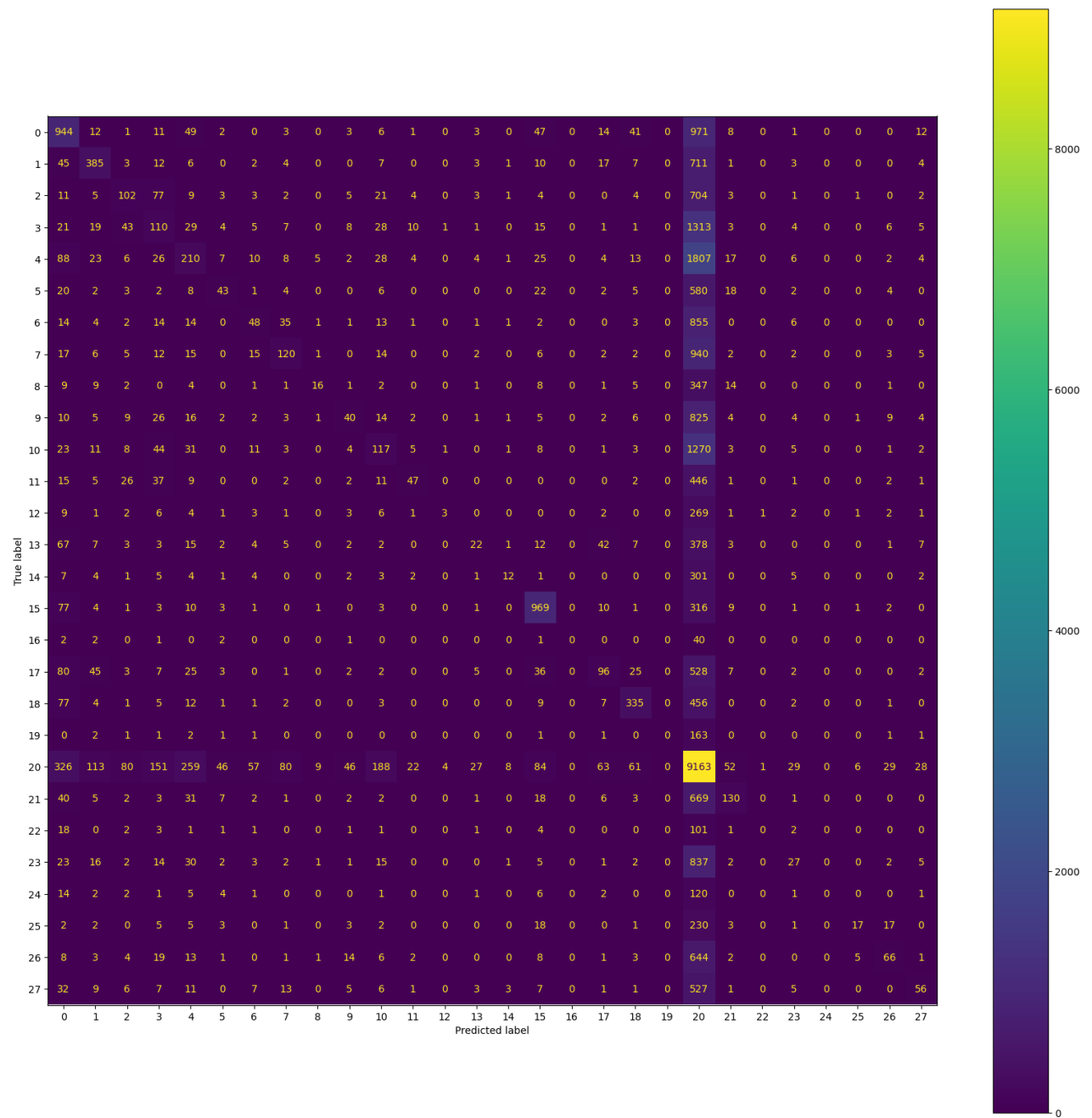
The performance of naive bayes classifier with default parameters for sentiments.

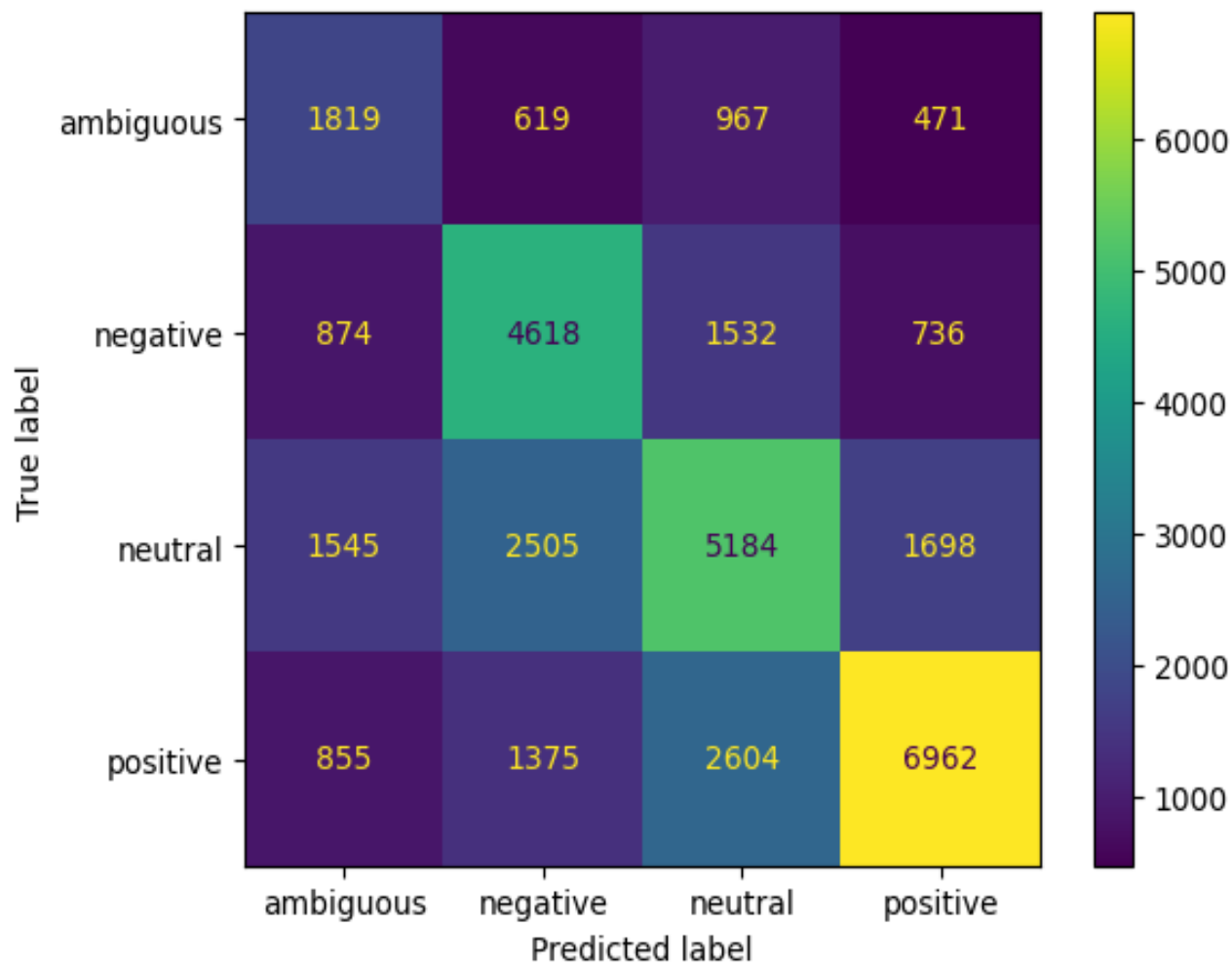|	precision	recall	f1-score	support
ambiguous	0.42	0.25	0.31	3876
negative	0.54	0.53	0.53	7760
neutral	0.48	0.49	0.49	10932
positive	0.62	0.71	0.66	11796
accuracy			0.55	34364
macro avg	0.52	0.49	0.50	34364
weighted avg	0.54	0.55	0.54	34364

2.3.2 The performance of decision tree classifier with default parameters for emotions.

	precision	recall	f1-score	support
admiration	0.40	0.56	0.47	2129
amusement	0.42	0.58	0.49	1221
anger	0.23	0.38	0.29	965
annoyance	0.15	0.22	0.18	1634
approval	0.20	0.27	0.23	2300
caring	0.22	0.25	0.24	722
confusion	0.24	0.30	0.26	1015
curiosity	0.31	0.33	0.32	1169
desire	0.23	0.26	0.24	422
disappointment	0.17	0.18	0.18	992
disapproval	0.23	0.22	0.22	1552
disgust	0.27	0.20	0.23	607
embarrassment	0.23	0.17	0.19	319
excitement	0.22	0.21	0.22	583
fear	0.39	0.35	0.37	355
gratitude	0.74	0.75	0.75	1413
grief	0.04	0.06	0.05	49
joy	0.27	0.23	0.25	869
love	0.52	0.52	0.52	916
nervousness	0.18	0.13	0.15	175
neutral	0.50	0.43	0.46	10932
optimism	0.39	0.21	0.27	923
pride	0.07	0.02	0.03	137
realization	0.21	0.08	0.12	991
relief	0.17	0.07	0.10	161
remorse	0.42	0.32	0.36	310
sadness	0.32	0.18	0.23	802
surprise	0.36	0.20	0.25	701
accuracy			0.36	34364
macro avg	0.29	0.27	0.27	34364
weighted avg	0.37	0.36	0.36	34364
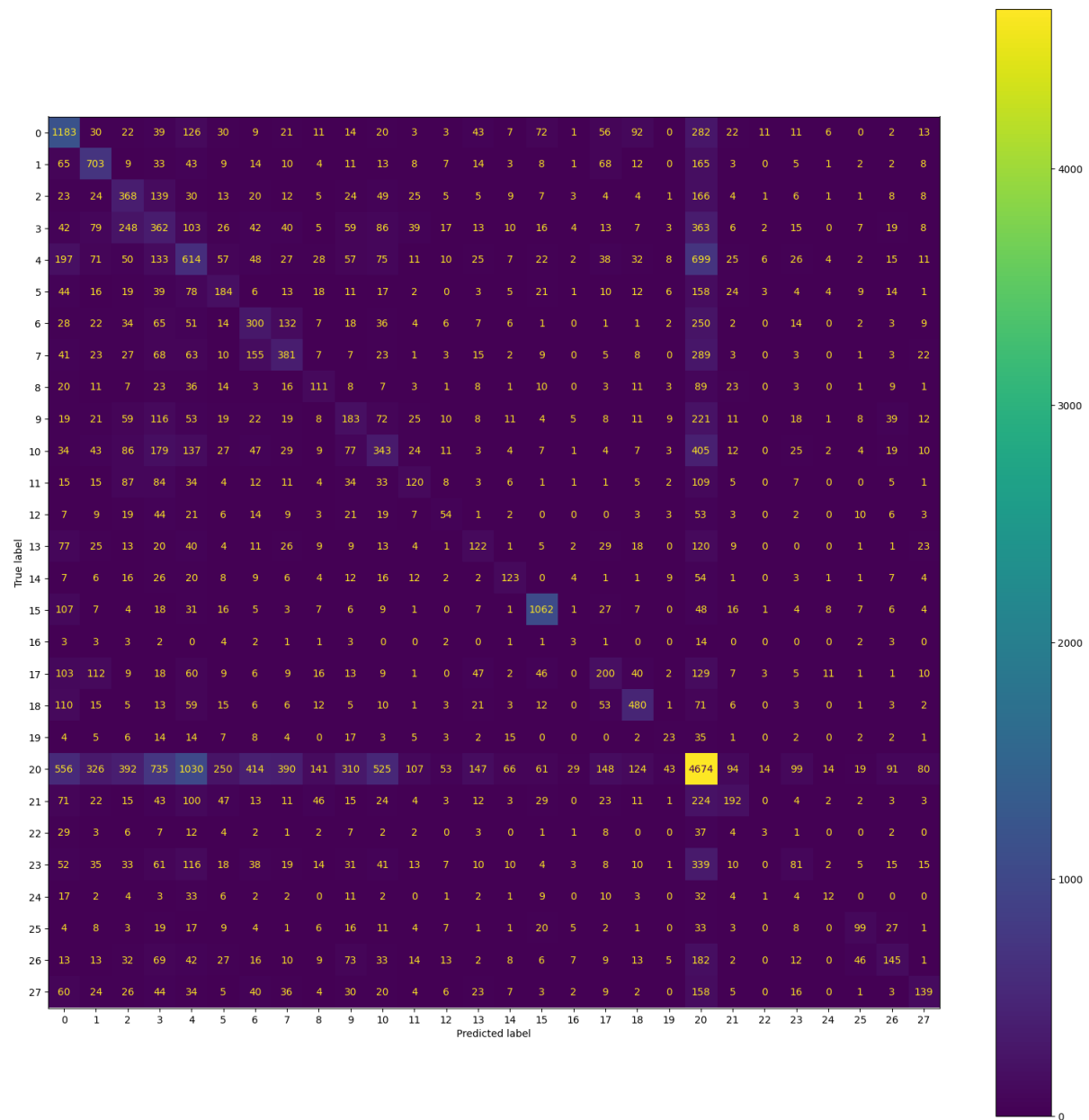
The performance of decision tree classifier with default parameters for sentiments.

	precision	recall	f1-score	support
ambiguous	0.36	0.47	0.41	3876
negative	0.51	0.60	0.55	7760
neutral	0.50	0.47	0.49	10932
positive	0.71	0.59	0.64	11796
accuracy			0.54	34364
macro avg	0.52	0.53	0.52	34364
weighted avg	0.56	0.54	0.55	34364

### 2.3.3 The performance of Multilayer Perceptron with default parameters for emotions.

	precision	recall	f1-score	support
0	0.49	0.53	0.51	2219
1	0.47	0.56	0.51	1222
2	0.35	0.29	0.31	1036
3	0.19	0.16	0.17	1596
4	0.25	0.14	0.18	2312
5	0.25	0.17	0.20	712
6	0.24	0.18	0.20	1006
7	0.33	0.29	0.31	1142
8	0.34	0.28	0.31	496
9	0.21	0.15	0.18	940
10	0.24	0.20	0.22	1522
11	0.23	0.24	0.24	604
12	0.25	0.19	0.21	307
13	0.23	0.17	0.20	592
14	0.41	0.38	0.40	353
15	0.77	0.74	0.75	1394
16	0.24	0.14	0.18	83
17	0.31	0.27	0.29	853
18	0.57	0.57	0.57	985
19	0.19	0.14	0.16	159
20	0.46	0.60	0.52	10975
21	0.34	0.28	0.31	874
22	0.13	0.09	0.11	148
23	0.18	0.13	0.15	966
24	0.14	0.13	0.13	130
25	0.39	0.36	0.37	293
26	0.33	0.26	0.29	790
27	0.32	0.29	0.30	655
accuracy			0.40	34364
macro avg	0.32	0.28	0.30	34364
weighted avg	0.38	0.40	0.38	34364
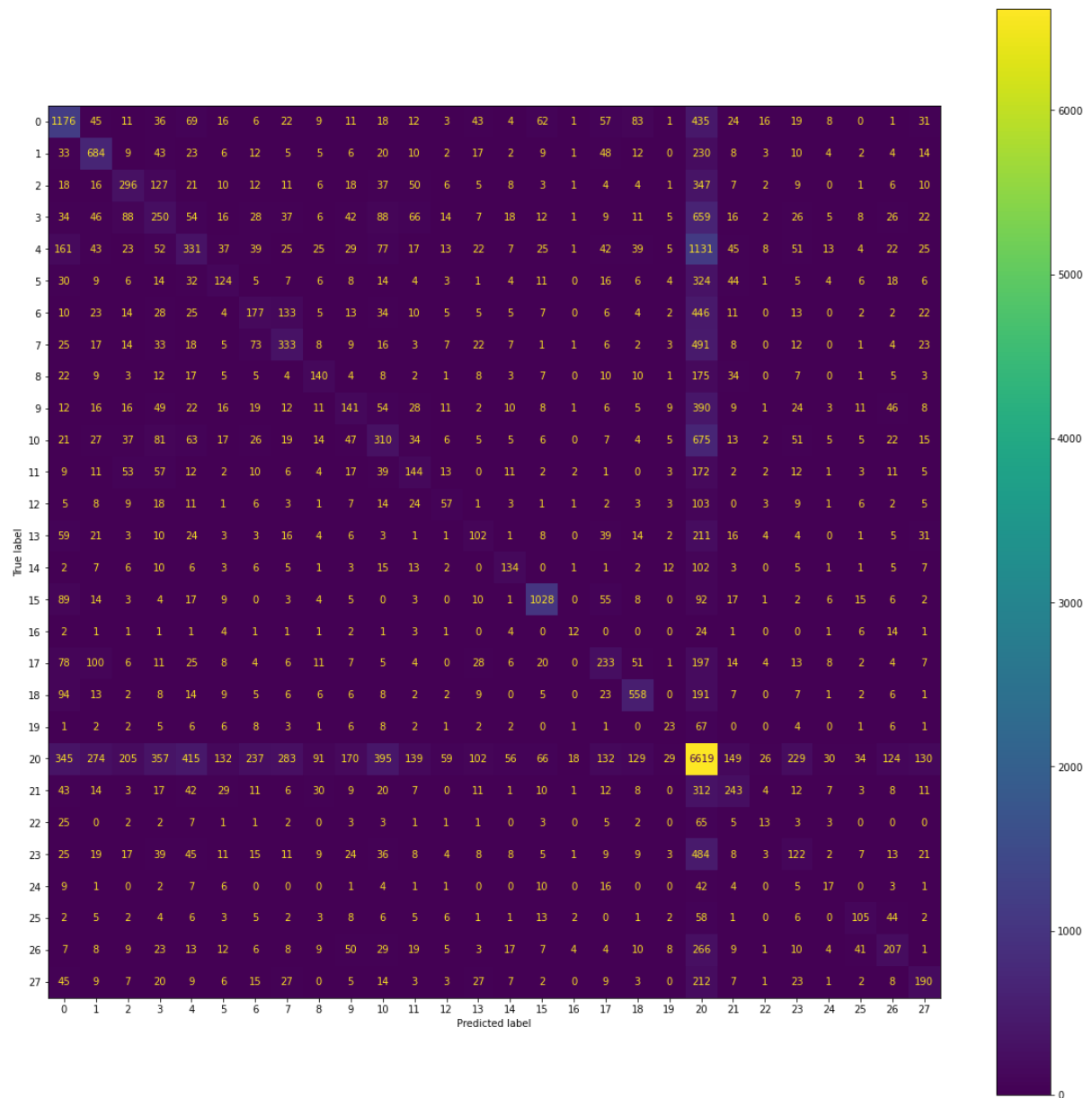
The performance of Multilayer Perceptron classifier with default parameters for sentiments.

	precision	recall	f1-score	support
0	0.46	0.23	0.31	3828
1	0.57	0.51	0.54	7720
2	0.48	0.61	0.54	11118
3	0.69	0.67	0.68	11698
accuracy			0.57	34364
macro avg	0.55	0.51	0.52	34364
weighted avg	0.57	0.57	0.56	34364
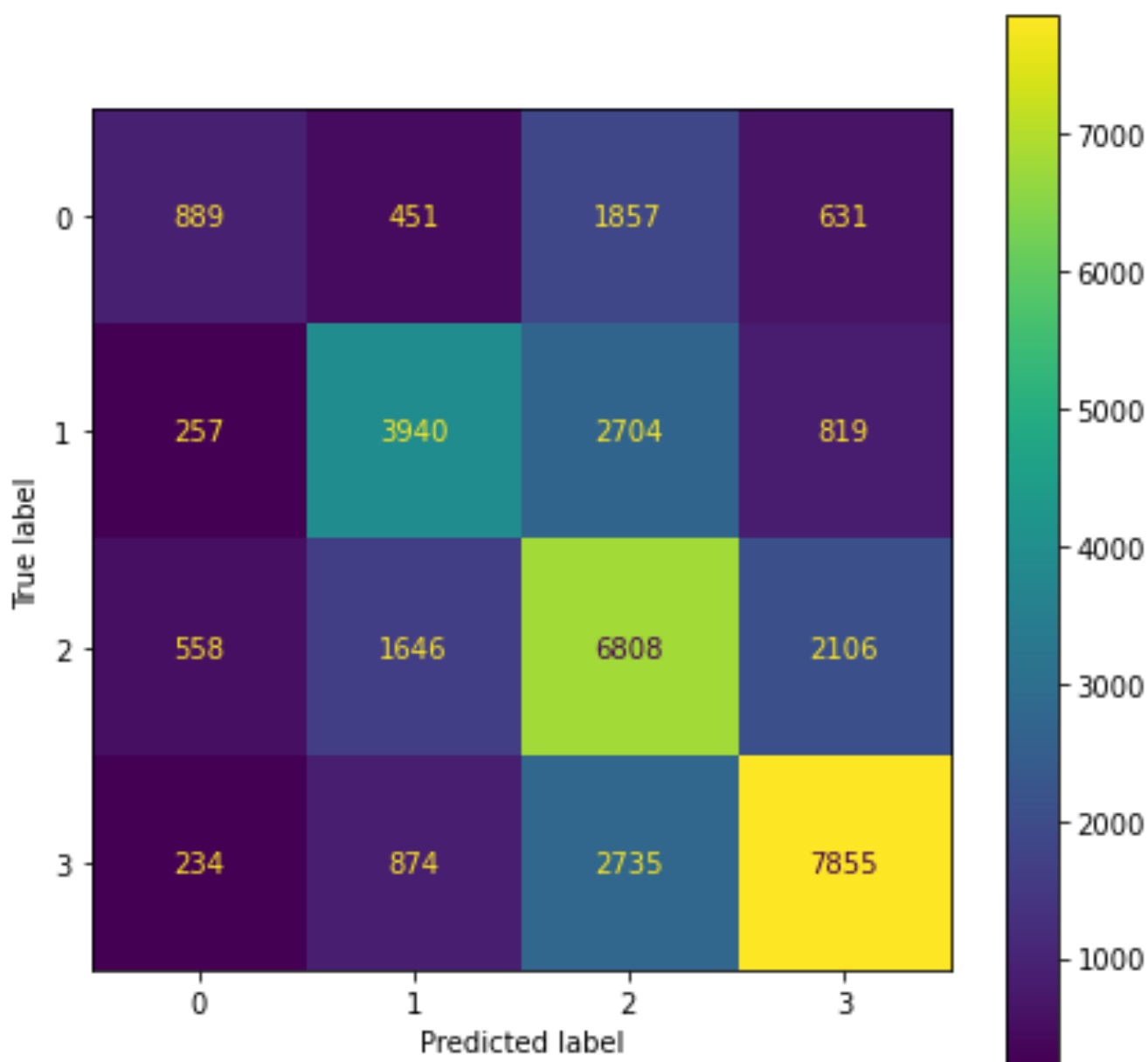
2.3.4 The performance of naive bayes classifier with best hyper-parameters for emotions.

The best hyper-parameter value is : {'alpha': 0}

```
                precision    recall  f1-score   support

     admiration      0.46      0.50      0.48      2129
      amusement      0.46      0.56      0.50      1221
          anger      0.27      0.32      0.30       965
      annoyance      0.19      0.14      0.16      1634
       approval      0.24      0.15      0.19      2300
         caring      0.20      0.27      0.23       722
      confusion      0.23      0.23      0.23      1015
      curiosity      0.29      0.28      0.29      1169
         desire      0.24      0.30      0.27       422
 disappointment      0.19      0.14      0.16       992
    disapproval      0.22      0.19      0.20      1552
        disgust      0.23      0.25      0.24       607
  embarrassment      0.20      0.24      0.22       319
     excitement      0.19      0.20      0.19       583
           fear      0.32      0.38      0.35       355
      gratitude      0.64      0.74      0.69      1413
          grief      0.06      0.16      0.09        49
            joy      0.29      0.28      0.29       869
           love      0.50      0.58      0.54       916
    nervousness      0.13      0.21      0.16       175
        neutral      0.48      0.47      0.48     10932
       optimism      0.29      0.31      0.30       923
          pride      0.07      0.09      0.08       137
    realization      0.15      0.12      0.13       991
         relief      0.10      0.16      0.12       161
        remorse      0.30      0.40      0.34       310
        sadness      0.27      0.26      0.26       802
       surprise      0.27      0.31      0.28       701

       accuracy                          0.36     34364
      macro avg      0.27      0.29      0.28     34364
   weighted avg      0.36      0.36      0.36     34364
```
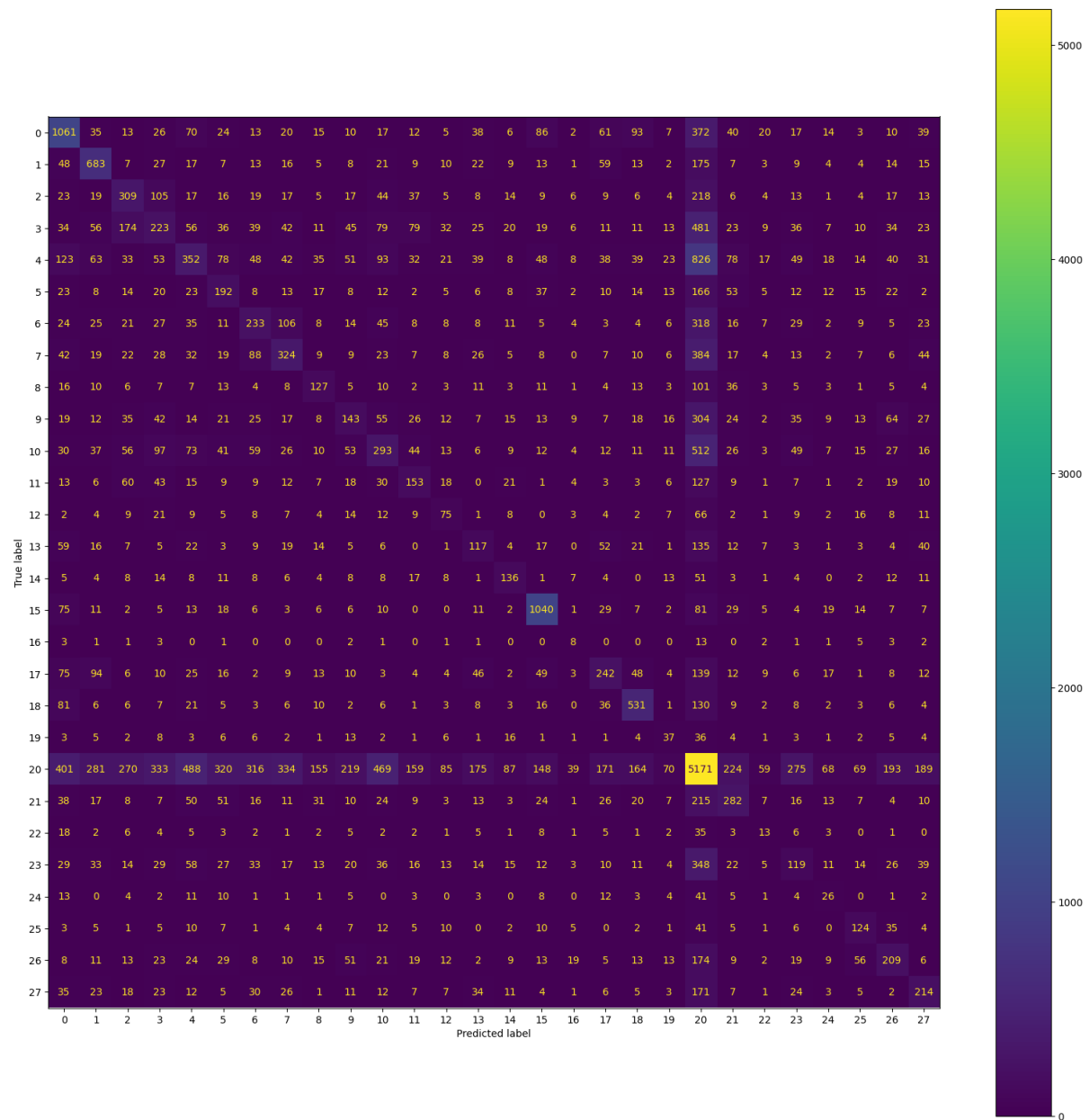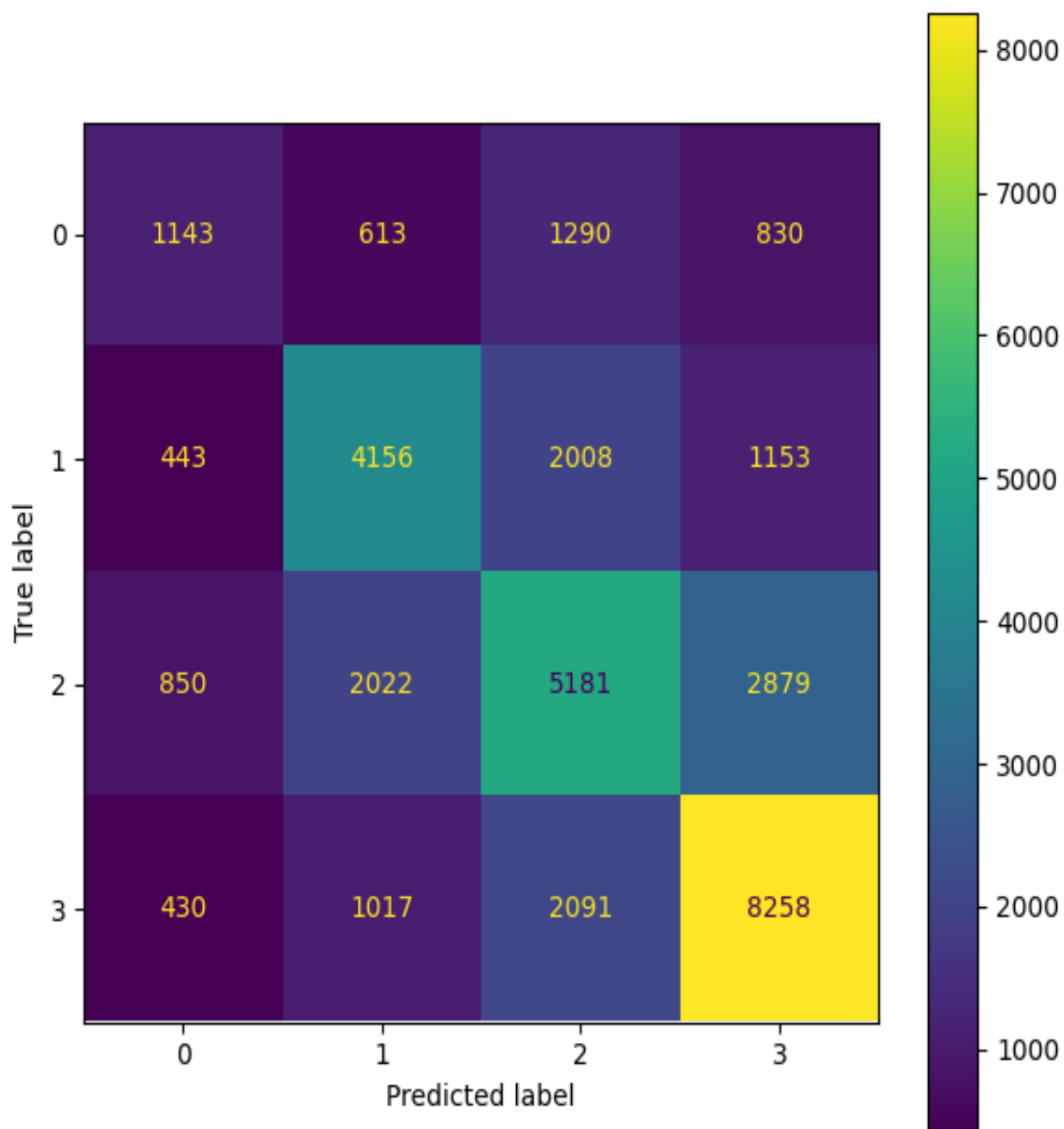
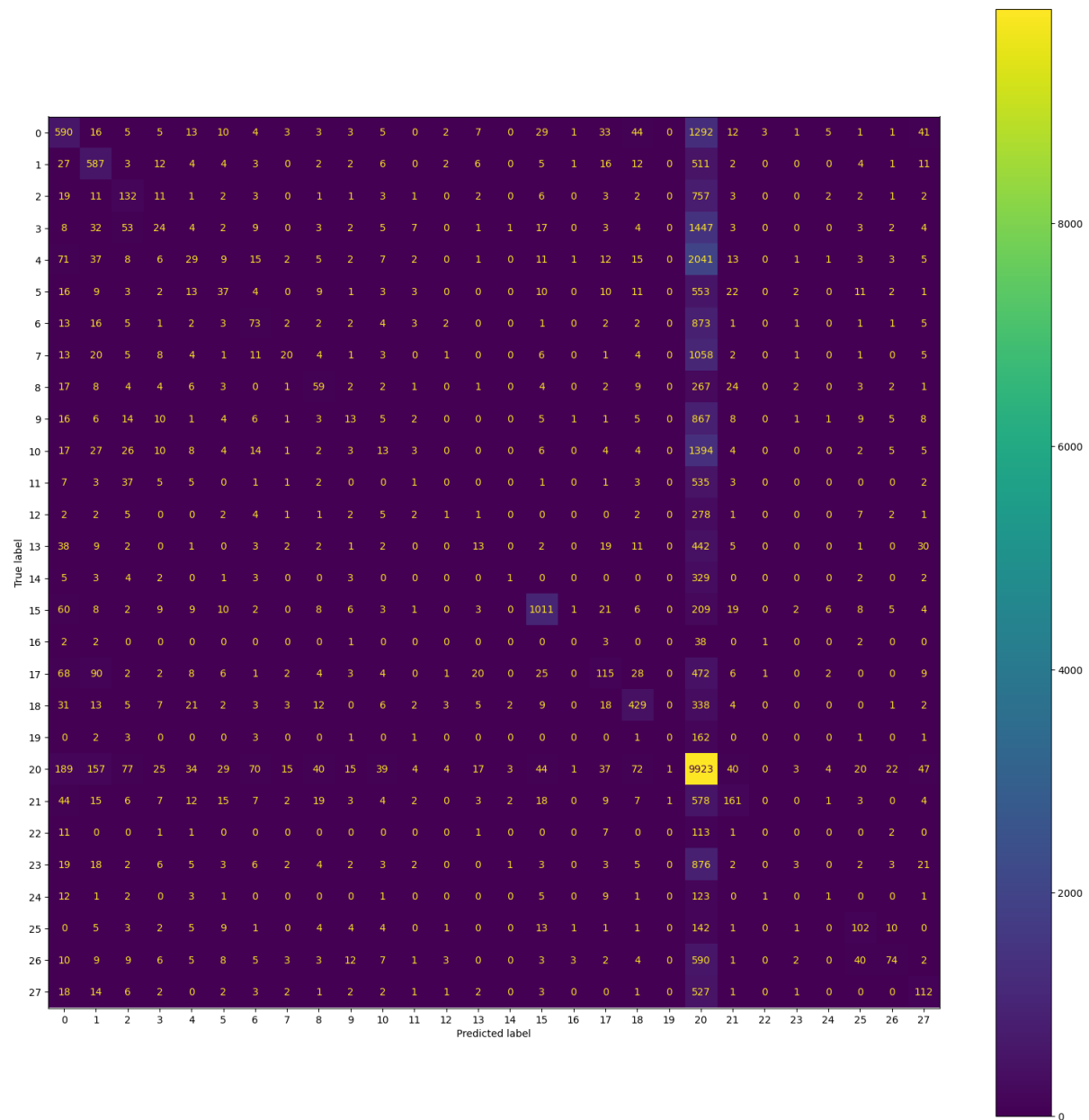**The performance of naive bayes classifier with best hyper-parameters for sentiments.**

The best hyper-parameter value is : {'alpha': 0.5}

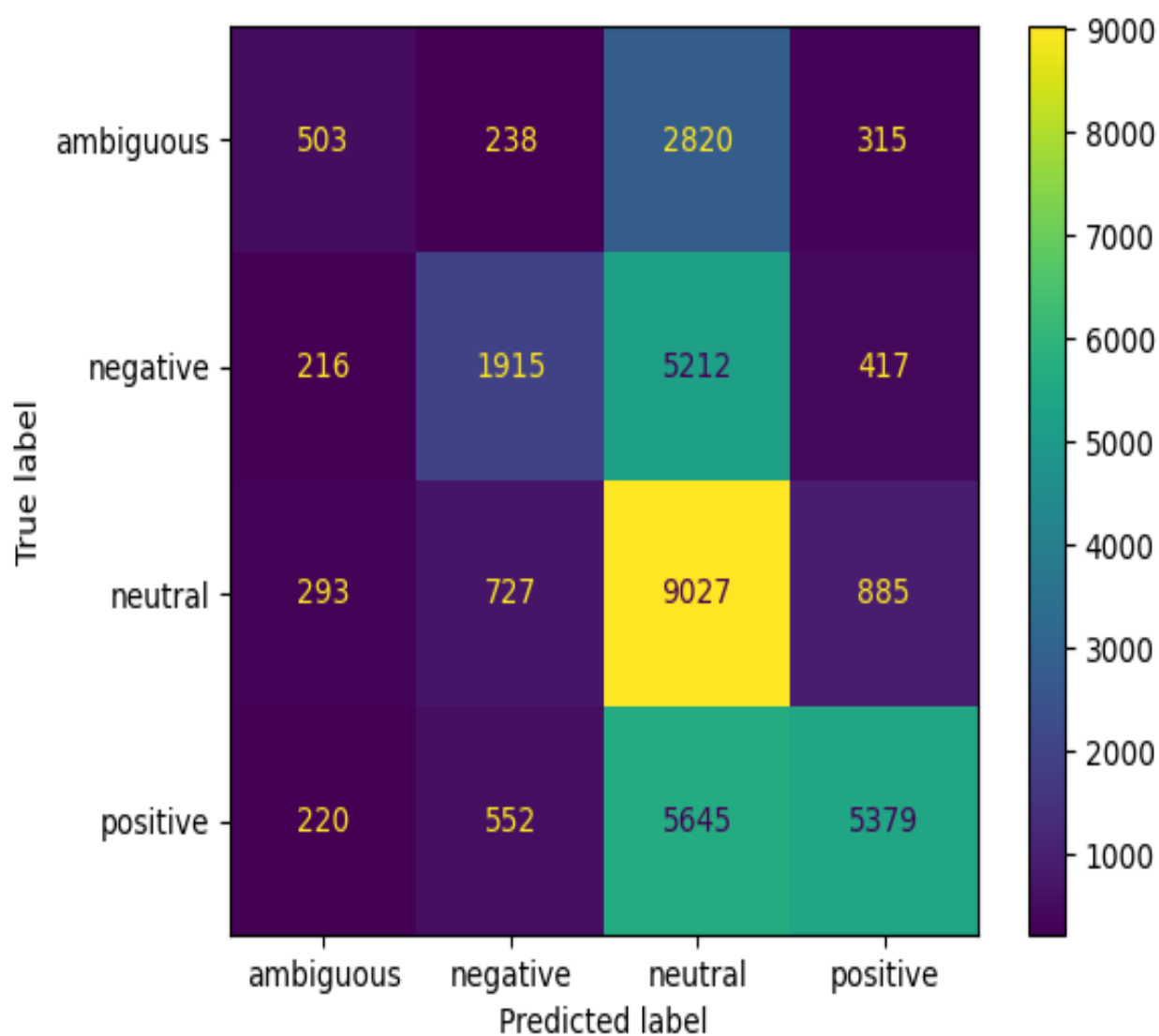|	precision	recall	f1-score	support
ambiguous	0.40	0.29	0.34	3876
negative	0.53	0.54	0.53	7760
neutral	0.49	0.47	0.48	10932
positive	0.63	0.70	0.66	11796
accuracy			0.55	34364
macro avg	0.51	0.50	0.50	34364
weighted avg	0.54	0.55	0.54	34364

2.3.5 The performance of decision tree classifier with best hyper-parameters for emotions.

	precision	recall	f1-score	support
admiration	0.45	0.28	0.34	2129
amusement	0.52	0.48	0.50	1221
anger	0.31	0.14	0.19	965
annoyance	0.14	0.01	0.03	1634
approval	0.15	0.01	0.02	2300
caring	0.22	0.05	0.08	722
confusion	0.29	0.07	0.12	1015
curiosity	0.32	0.02	0.03	1169
desire	0.31	0.14	0.19	422
disappointment	0.15	0.01	0.02	992
disapproval	0.10	0.01	0.02	1552
disgust	0.03	0.00	0.00	607
embarrassment	0.05	0.00	0.01	319
excitement	0.16	0.02	0.04	583
fear	0.10	0.00	0.01	355
gratitude	0.82	0.72	0.76	1413
grief	0.00	0.00	0.00	49
joy	0.35	0.13	0.19	869
love	0.63	0.47	0.54	916
nervousness	0.00	0.00	0.00	175
neutral	0.37	0.91	0.53	10932
optimism	0.47	0.17	0.26	923
pride	0.00	0.00	0.00	137
realization	0.14	0.00	0.01	991
relief	0.04	0.01	0.01	161
remorse	0.45	0.33	0.38	310
sadness	0.52	0.09	0.16	802
surprise	0.34	0.16	0.22	701
accuracy			0.39	34364
macro avg	0.26	0.15	0.17	34364
weighted avg	0.33	0.39	0.29	34364

The performance of decision tree classifier with best hyper-parameters for sentiments.
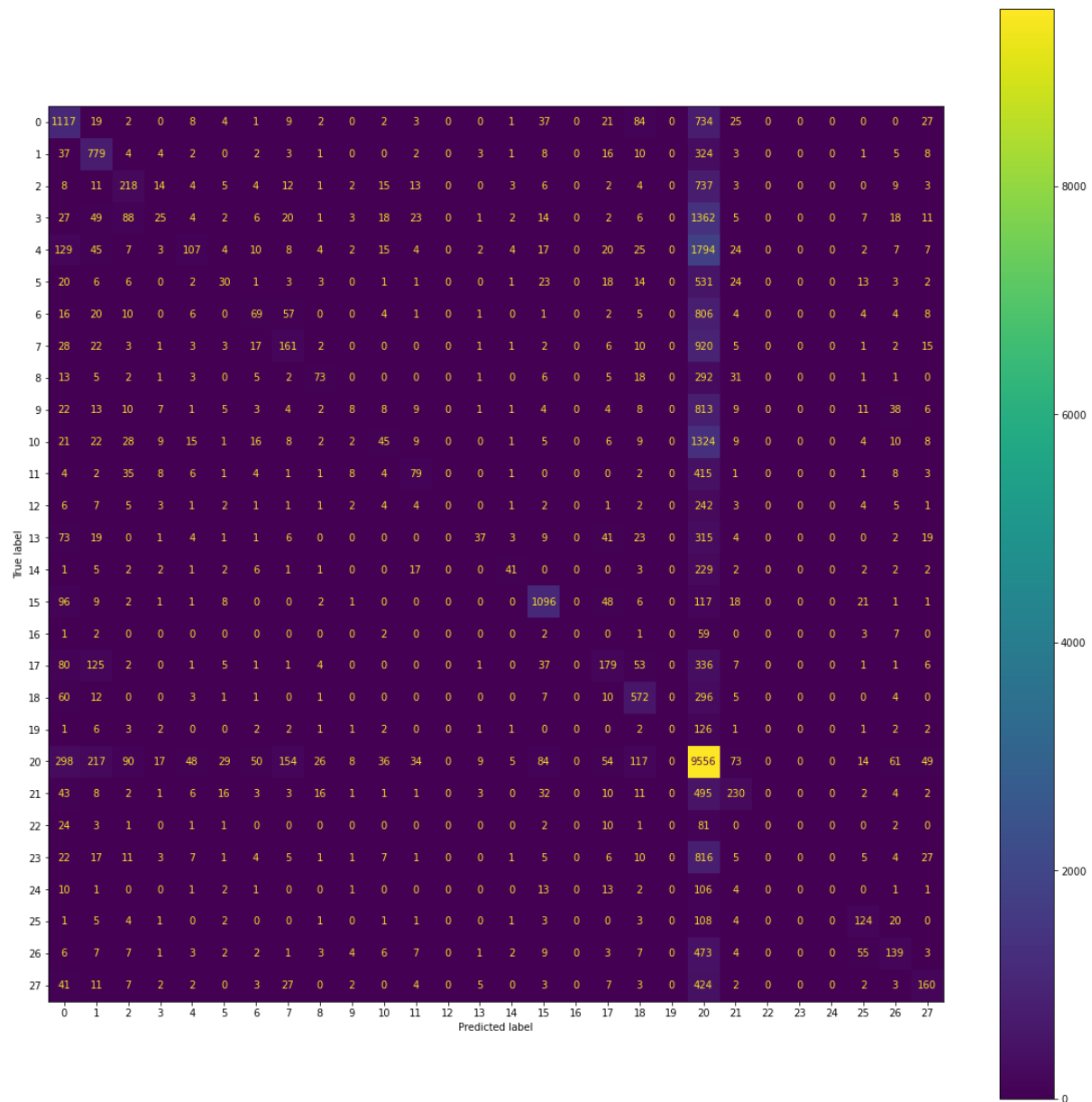
	precision	recall	f1-score	support
ambiguous	0.36	0.47	0.41	3876
negative	0.51	0.60	0.55	7760
neutral	0.50	0.47	0.49	10932
positive	0.71	0.59	0.64	11796
accuracy			0.54	34364
macro avg	0.52	0.53	0.52	34364
weighted avg	0.56	0.54	0.55	34364

2.3.6 The performance of Multi-Layered classifier with best hyper-parameters for emot ions.
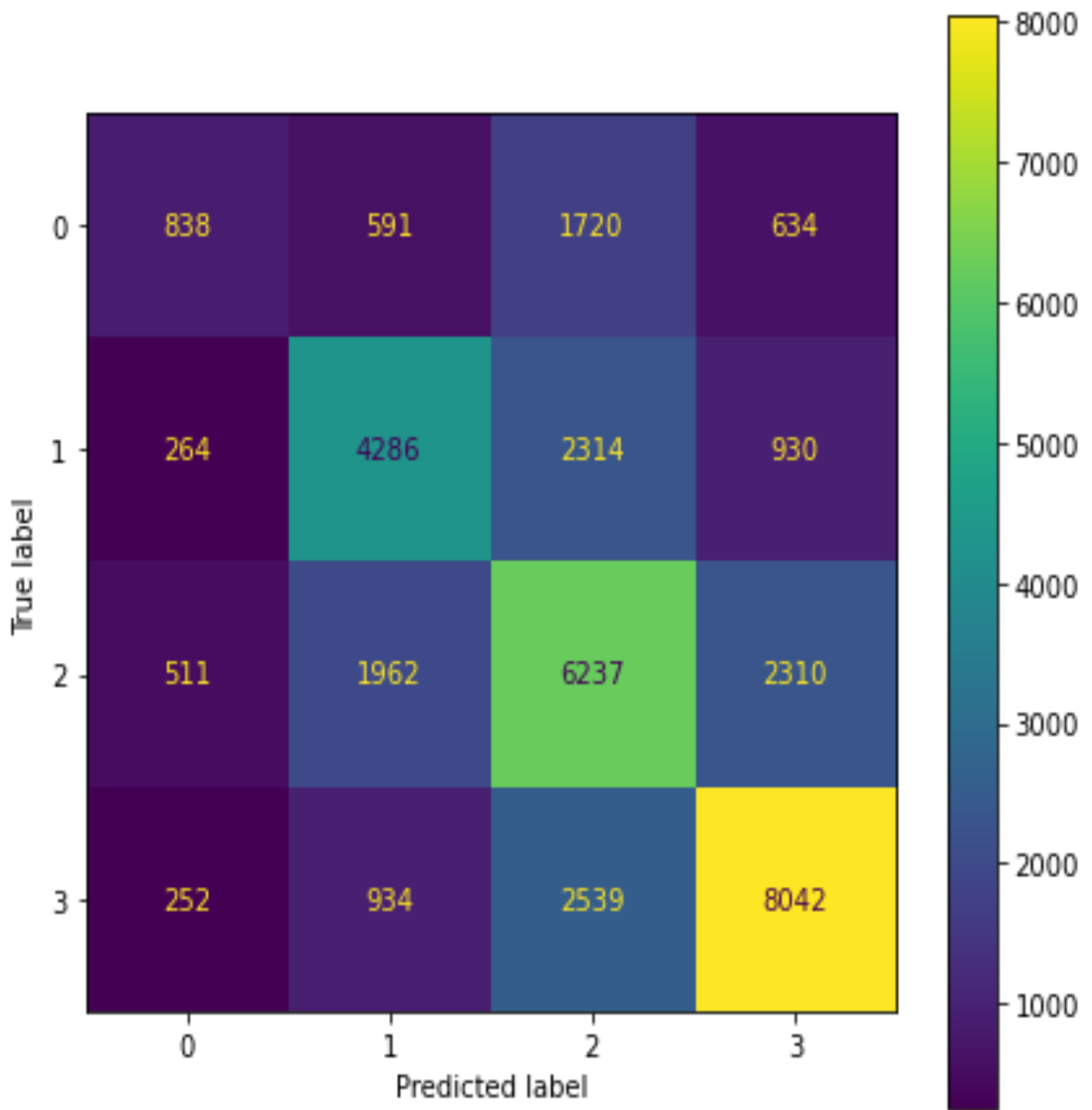
	precision	recall	f1-score	support
0	0.51	0.53	0.52	2096
1	0.54	0.64	0.59	1213
2	0.40	0.20	0.27	1074
3	0.24	0.01	0.03	1694
4	0.45	0.05	0.09	2240
5	0.24	0.04	0.07	702
6	0.32	0.07	0.11	1018
7	0.33	0.13	0.19	1203
8	0.49	0.16	0.24	459
9	0.17	0.01	0.02	987
10	0.26	0.03	0.05	1554
11	0.37	0.14	0.20	584
12	0.00	0.00	0.00	298
13	0.55	0.07	0.12	558
14	0.58	0.13	0.21	319
15	0.77	0.77	0.77	1428
16	0.00	0.00	0.00	77
17	0.37	0.21	0.27	840
18	0.57	0.59	0.58	972
19	0.00	0.00	0.00	156
20	0.40	0.87	0.55	11029
21	0.46	0.26	0.33	890
22	0.00	0.00	0.00	126
23	0.00	0.00	0.00	959
24	0.00	0.00	0.00	156
25	0.44	0.44	0.44	279
26	0.38	0.19	0.25	745
27	0.43	0.23	0.30	708
accuracy			0.43	34364
macro avg	0.33	0.21	0.22	34364
weighted avg	0.39	0.43	0.35	34364

The performance of Multi-Layered perceptron classifier with best hyper-parameters for sentiments.
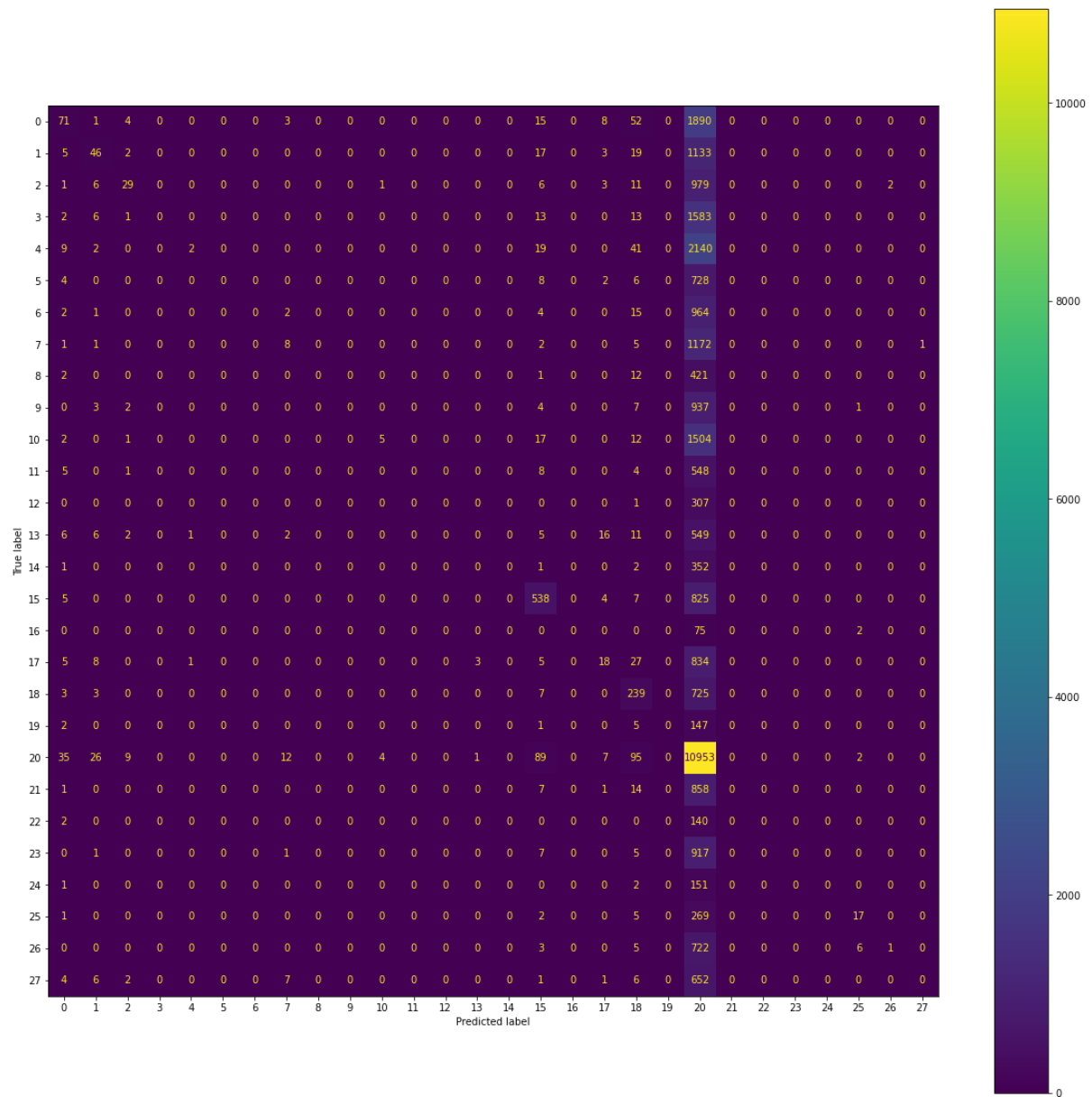
	precision	recall	f1-score	support
0	0.45	0.22	0.30	3783
1	0.55	0.55	0.55	7794
2	0.49	0.57	0.52	11020
3	0.67	0.68	0.68	11767
accuracy			0.56	34364
macro avg	0.54	0.51	0.51	34364
weighted avg	0.56	0.56	0.56	34364

PART 3: Embedding as features

3.5 The performance of base Multi-Layered classifier for emotions.

	precision	recall	f1-score	support
admiration	0.42	0.03	0.06	2044
amusement	0.40	0.04	0.07	1225
anger	0.55	0.03	0.05	1038
annoyance	0.00	0.00	0.00	1618
approval	0.50	0.00	0.00	2213
caring	0.00	0.00	0.00	748
confusion	0.00	0.00	0.00	988
curiosity	0.23	0.01	0.01	1190
desire	0.00	0.00	0.00	436
disappointment	0.00	0.00	0.00	954
disapproval	0.50	0.00	0.01	1541
disgust	0.00	0.00	0.00	566
embarrassment	0.00	0.00	0.00	308
excitement	0.00	0.00	0.00	598
fear	0.00	0.00	0.00	356
gratitude	0.69	0.39	0.50	1379
grief	0.00	0.00	0.00	77
joy	0.29	0.02	0.04	901
love	0.38	0.24	0.30	977
nervousness	0.00	0.00	0.00	155
neutral	0.34	0.98	0.50	11233
optimism	0.00	0.00	0.00	881
pride	0.00	0.00	0.00	142
realization	0.00	0.00	0.00	931
relief	0.00	0.00	0.00	154
remorse	0.61	0.06	0.11	294
sadness	0.33	0.00	0.00	737
surprise	0.00	0.00	0.00	679
accuracy			0.35	34363
macro avg	0.19	0.06	0.06	34363
weighted avg	0.29	0.35	0.20	34363

The performance of base Multi-Layered classifier for sentiments.

	precision	recall	f1-score	support
ambiguous	0.42	0.02	0.04	3788
negative	0.33	0.22	0.27	7644
neutral	0.40	0.43	0.42	11233
positive	0.44	0.63	0.52	11698
accuracy			0.41	34363
macro avg	0.40	0.33	0.31	34363
weighted avg	0.40	0.41	0.38	34363
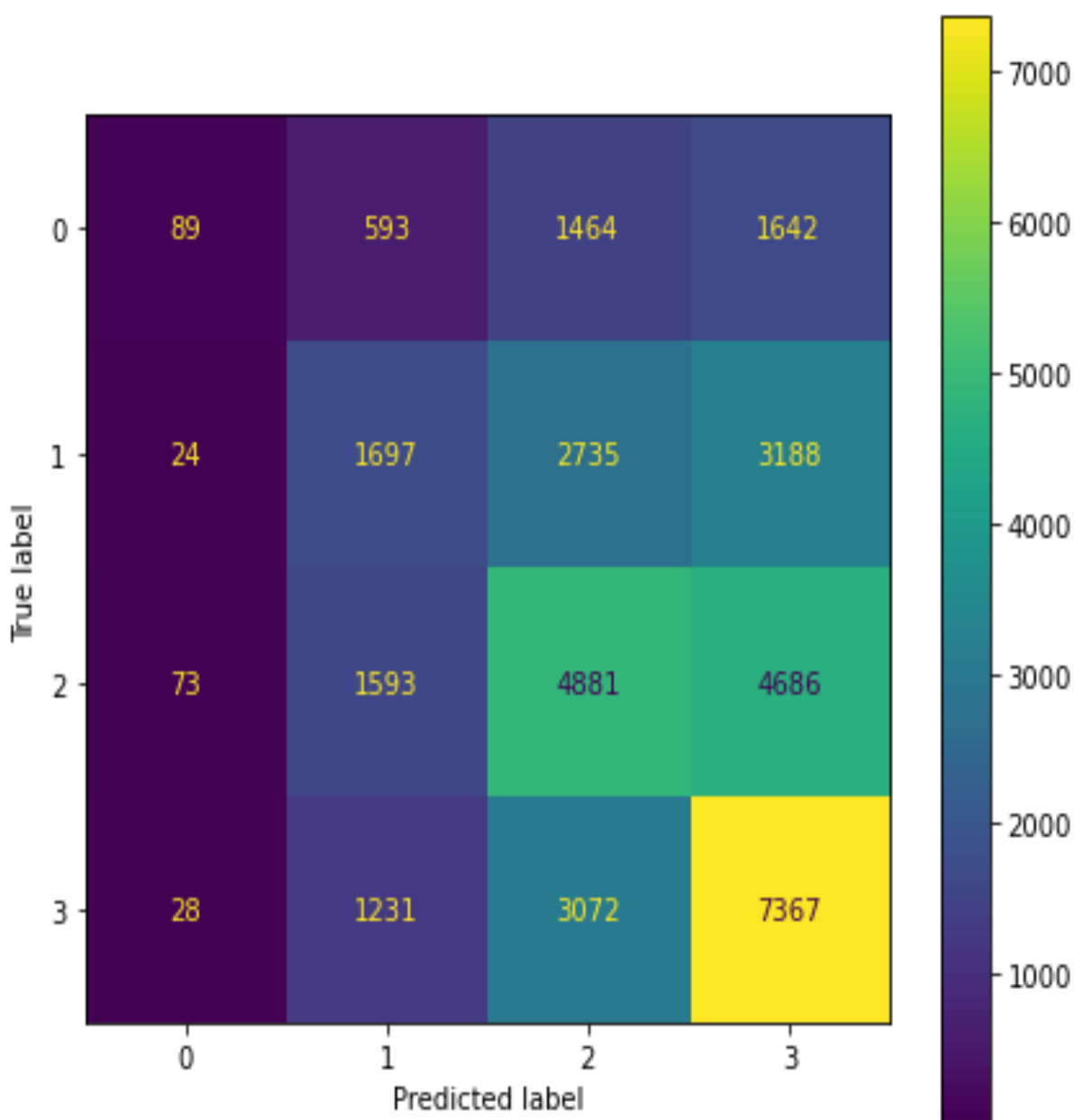
3.6 The performance of Multi-Layered perceptron classifier with best hyper-parameters for emotions.

	precision	recall	f1-score	support
admiration	0.38	0.02	0.05	2044
amusement	0.35	0.04	0.08	1225
anger	0.47	0.02	0.04	1038
annoyance	0.00	0.00	0.00	1618
approval	0.00	0.00	0.00	2213
caring	0.00	0.00	0.00	748
confusion	0.00	0.00	0.00	988
curiosity	0.27	0.01	0.01	1190
desire	0.00	0.00	0.00	436
disappointment	0.00	0.00	0.00	954
disapproval	0.70	0.00	0.01	1541
disgust	0.00	0.00	0.00	566
embarrassment	0.00	0.00	0.00	308
excitement	1.00	0.00	0.00	598
fear	0.00	0.00	0.00	356
gratitude	0.55	0.47	0.50	1379
grief	0.00	0.00	0.00	77
joy	0.34	0.01	0.03	901
love	0.43	0.19	0.27	977
nervousness	0.00	0.00	0.00	155
neutral	0.34	0.97	0.50	11233
optimism	0.33	0.00	0.00	881
pride	0.00	0.00	0.00	142
realization	0.00	0.00	0.00	931
relief	0.00	0.00	0.00	154
remorse	0.35	0.04	0.08	294
sadness	0.00	0.00	0.00	737
surprise	0.00	0.00	0.00	679
accuracy			0.35	34363
macro avg	0.20	0.06	0.06	34363
weighted avg	0.27	0.35	0.20	34363
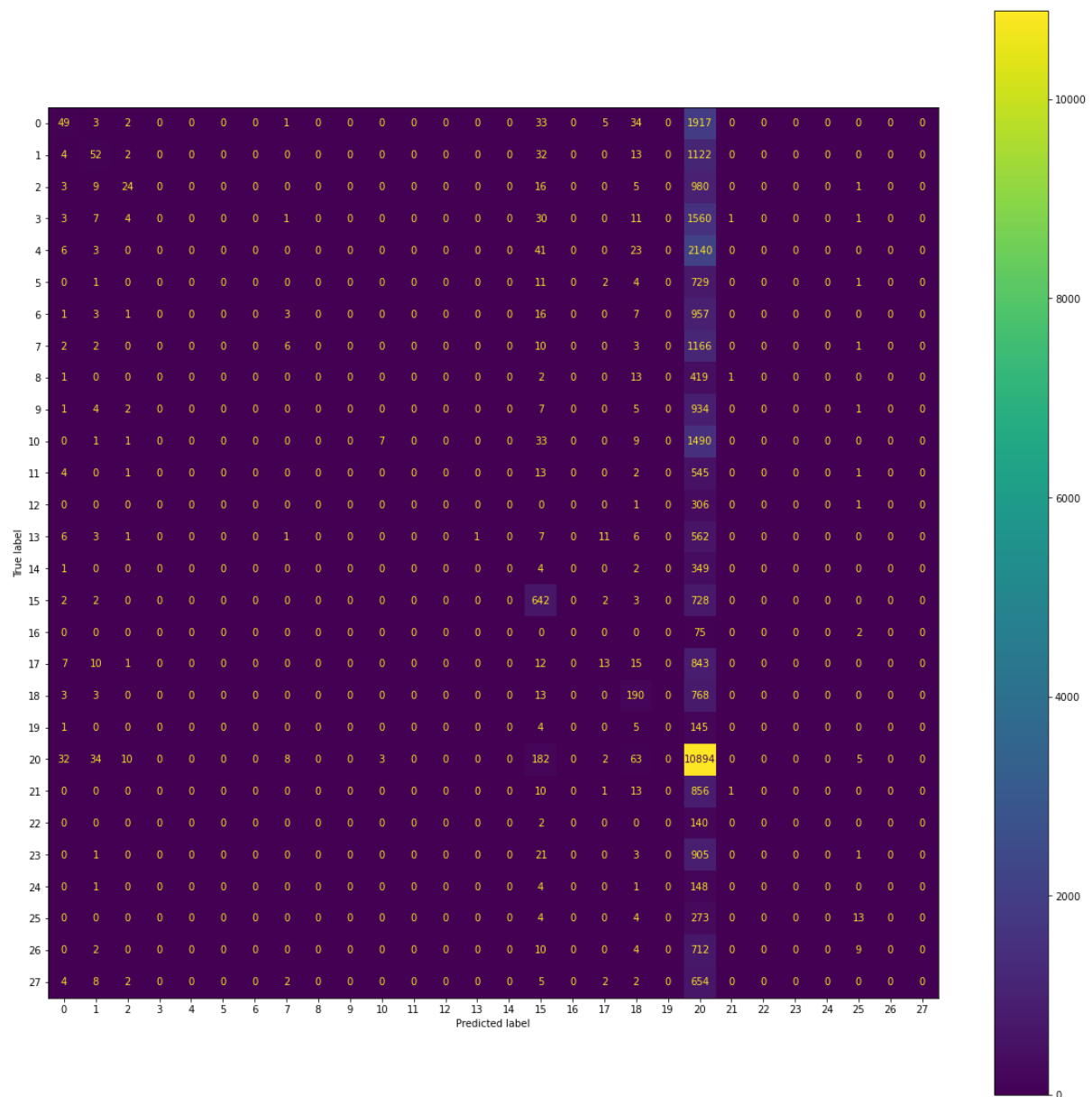
The performance of Multi-Layered perceptron classifier with best hyper-parameters for sentiments.

	precision	recall	f1-score	support
ambiguous	0.44	0.03	0.05	3788
negative	0.43	0.04	0.07	7644
neutral	0.39	0.47	0.42	11233
positive	0.41	0.71	0.52	11698
accuracy			0.40	34363
macro avg	0.42	0.31	0.27	34363
weighted avg	0.41	0.40	0.34	34363