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49  28369  □□□□□  ...          0.0
50  28370  other  ...          0.0
51  28371  □□□□  ...          0.0
52  28372   □□□  ...          0.0
53
54  [28373 rows x 22712 columns]
55  transform w2v
56        label  ... w2v_4_max_299
57  0      □□□□  ...      0.054239
58  1      □□□□  ...      0.366395
59  2        □□  ...     -0.033314
60  3        □□  ...      0.040619
61  4       □□□  ...      0.097385
62  ...      ...  ...           ...
63  28368     □□  ...     -0.161887
64  28369  □□□□□  ...     -0.085961
65  28370  other  ...      0.060511
```

```
66 28371    □□□□    ...         0.446367
67 28372     □□□    ...        -0.370565
68
69 [28373 rows x 25712 columns]
70          label   ...                  lda_10
71 0        □□□□    ...                   [0.0]
72 1        □□□□    ...     [0.15926872193813324]
73 2         □□     ...                   [0.0]
74 3         □□     ...                   [0.0]
75 4        □□□     ...                   [0.0]
76 ...      ...     ...                    ...
77 28368     □□     ...     [0.41494041681289673]
78 28369  □□□□□    ...     [0.18126417696475983]
79 28370  other    ...                   [0.0]
80 28371  □□□□    ...                   [0.0]
81 28372   □□□    ...                   [0.0]
82
83 [28373 rows x 25723 columns]
84 Building prefix dict from the default dictionary ...
85 Loading model from cache C:\Users\ROG\AppData\Local\
   Temp\jieba.cache
86 Loading model cost 0.591 seconds.
87 Prefix dict has been built succesfully.
88          label   ... mean_word_len
89 0        □□□□    ...      2.000000
90 1        □□□□    ...      1.647727
91 2         □□     ...      1.633333
92 3         □□     ...      1.904762
93 4        □□□     ...      1.617647
94 ...      ...     ...         ...
95 28368     □□     ...      2.285714
96 28369  □□□□□    ...      1.600000
97 28370  other    ...      1.653846
98 28371  □□□□    ...      1.757576
99 28372   □□□    ...      1.823529
100
101 [28373 rows x 25740 columns]
102          label
                                                      text
103 0        □□□□   □□ □ □ □ □ □ □ □ □ □ □ □ □□ □□ || □□ □□ □
       □□ □□ ...
104 1        □□□□   □□ □ □□ NUM □ || □□□□ □□ □ □□ □ NUM □
       || □□ NU...
105 2        □□□□   □ □ □ □□ □□ □□ □ □ || □□ □□ || □ □ □ □□
```

```
105  □ □□ □...
106 3         □□□  □□ □□ □□ □□ □ □□ || □ □ □□ □□ □□□ □ □□
    □ □□ □ ...
107 4       other                        □□ □ □ □ □□ □□ □ □
    || □ □ □ □□
108 ...        ...
          ...
109 1575     □□  □□ □□ || □ □□ □ □ □ □□ □□ □□ □ || □ □□
    □ □ □ |...
110 1576   □□□□  □□ □□ || □ □ □□ □ □□□ || □□ □□ □□ □□
    || □□ □ □...
111 1577    □□□                  □□□□□ || □□
    □ □□ □ □□
112 1578    □□□                  □□ || □□ □ B
    □ □ □□□ □□
113 1579   □□□□   □□ □□ □ □ □□□□□ || □ □ □ □ □□ || □ □□
    □□ □□ □ □
114
115 [1580 rows x 2 columns]
116 0      □□ □ □ □ □ □ □ □ □ □ □□ □□ || □□ □□ □ □□
    □□ ...
117 1     □□ □ □□ NUM □ || □□□□ □□ □ □□ □ NUM □ || □□
    NU...
118 2     □ □ □ □□ □□ □□ □ □ || □□ □□ || □ □ □ □□ □ □□
    □...
119 3     □□ □□ □□ □□ □ □□ || □ □ □□ □□ □□□ □ □□ □ □□
    □ ...
120 4                □□ □ □ □ □□ □□ □ □ || □
    □ □ □□
121                        ...
122 1575   □□ □□ || □ □□ □ □ □ □□ □□ □□ □ || □ □□ □ □ □
    |...
123 1576   □□ □□ || □ □ □□ □ □□□ || □□ □□ □□ □□ || □□ □
    □...
124 1577                    □□□□□ || □□ □ □□
    □ □□
125 1578                    □□ || □□ □ B □ □
    □□□ □□
126 1579    □□ □□ □ □ □□□□□ || □ □ □ □ □□ || □ □□ □□
    □□ □ □
127 Name: text, Length: 1580, dtype: object
128 0       □□ □ □ □ □ □ □ □ □□ □□ || □□ □□ □ □□ □□ □□ □
    □...
```

```
129 1          □□ □ □□ NUM □ || □□□□□ □□ □ □□ NUM □ || □□
    NUM-...
130 2          □ □ □ □□ □□ □ || □□ □□ || □ □ □ □□ □ □□ □□
    □□ ...
131 3          □□ □□ □□ □□ □ □□ || □□ □□□ □ □□ □ □ □ □ □
     || □...
132 4                          □□ □ □□ □□ □ || □
    □ □□
133                                      ...

134 1575     □□ □□ || □□ □ □ □□ □□ □□ || □ □□ □ □ □ || □□
    □...
135 1576     □□ □□ || □ □□ □□□ || □□ □□ □□ □□ || □□ □ □
    □□□...
136 1577                          □□□□□ || □□ □□
    □ □□
137 1578                      □□ || □□ □ B □ □
    □□□ □□
138 1579                  □□ □□ □□□□□ || □ □ □ □□ || □□
    □□ □
139 Name: text, Length: 1580, dtype: object
140        label  ... tfidf22709
141 0      □□□□  ...        0.0
142 1      □□□□  ...        0.0
143 2      □□□□  ...        0.0
144 3       □□□  ...        0.0
145 4     other  ...        0.0
146 ...     ...  ...        ...
147 1575     □□  ...        0.0
148 1576   □□□□  ...        0.0
149 1577    □□□  ...        0.0
150 1578    □□□  ...        0.0
151 1579   □□□□  ...        0.0
152
153 [1580 rows x 22712 columns]
154 transform w2v
155        label  ... w2v_4_max_299
156 0      □□□□  ...     -0.016342
157 1      □□□□  ...     -0.047609
158 2      □□□□  ...      0.395582
159 3       □□□  ...      0.180093
160 4     other  ...      0.113059
161 ...     ...  ...           ...
162 1575     □□  ...     -0.282726
```

```
163 1576    □□□□   ...       0.074011
164 1577    □□□     ...      -0.127310
165 1578    □□□     ...       0.263881
166 1579    □□□□   ...      -0.318620
167
168 [1580 rows x 25712 columns]
169        label   ...              lda_10
170 0      □□□□   ...    [0.24406987428666516]
171 1      □□□□   ...                   [0.0]
172 2      □□□□   ...    [0.5561922788619995]
173 3       □□□    ...                   [0.0]
174 4      other   ...                   [0.0]
175 ...     ...    ...                    ...
176 1575     □□    ...                   [0.0]
177 1576    □□□□   ...    [0.12865708768367767]
178 1577    □□□     ...    [0.2714894413948059]
179 1578    □□□     ...                   [0.0]
180 1579    □□□□   ...                   [0.0]
181
182 [1580 rows x 25723 columns]
183        label   ... mean_word_len
184 0      □□□□   ...       1.473684
185 1      □□□□   ...       2.194444
186 2      □□□□   ...       1.588889
187 3       □□□    ...       1.566038
188 4      other   ...       1.416667
189 ...     ...    ...            ...
190 1575     □□    ...       1.500000
191 1576    □□□□   ...       1.848485
192 1577    □□□     ...       2.142857
193 1578    □□□     ...       1.666667
194 1579    □□□□   ...       1.666667
195
196 [1580 rows x 25740 columns]
197 X_train: (28373, 25738) y_train: (28373,)
198 E:\Lib\site-packages\lightgbm\engine.py:148:
    UserWarning: Found `num_trees` in params. Will use
    it instead of argument
199   _log_warning("Found `{}` in params. Will use it
    instead of argument".format(alias))
200 [LightGBM] [Warning] Auto-choosing col-wise multi-
    threading, the overhead of testing was 1.463411
    seconds.
201 You can set `force_col_wise=true` to remove the
```

```
201 overhead.
202 [LightGBM] [Info] Total Bins 832855
203 [LightGBM] [Info] Number of data points in the train
    set: 28373, number of used features: 5152
204 [LightGBM] [Info] Start training from score 4.425581
205 [1] valid_0's rmse: 2.83823
206 [2] valid_0's rmse: 2.76574
207 [3] valid_0's rmse: 2.71759
208 [4] valid_0's rmse: 2.66237
209 [5] valid_0's rmse: 2.60817
210 [6] valid_0's rmse: 2.56308
211 [7] valid_0's rmse: 2.53058
212 [8] valid_0's rmse: 2.50946
213 [9] valid_0's rmse: 2.46862
214 [10]    valid_0's rmse: 2.44128
215 [11]    valid_0's rmse: 2.41514
216 [12]    valid_0's rmse: 2.37837
217 [13]    valid_0's rmse: 2.35329
218 [14]    valid_0's rmse: 2.32861
219 [15]    valid_0's rmse: 2.30758
220 [16]    valid_0's rmse: 2.29475
221 [17]    valid_0's rmse: 2.27373
222 [18]    valid_0's rmse: 2.2581
223 [19]    valid_0's rmse: 2.24231
224 [20]    valid_0's rmse: 2.23075
225 [21]    valid_0's rmse: 2.21192
226 [22]    valid_0's rmse: 2.19205
227 [23]    valid_0's rmse: 2.17985
228 [24]    valid_0's rmse: 2.16711
229 [25]    valid_0's rmse: 2.15825
230 [26]    valid_0's rmse: 2.14875
231 [27]    valid_0's rmse: 2.13851
232 [28]    valid_0's rmse: 2.13092
233 [29]    valid_0's rmse: 2.11863
234 [30]    valid_0's rmse: 2.11206
235 [31]    valid_0's rmse: 2.10853
236 [32]    valid_0's rmse: 2.09986
237 [33]    valid_0's rmse: 2.0915
238 [34]    valid_0's rmse: 2.08591
239 [35]    valid_0's rmse: 2.07995
240 [36]    valid_0's rmse: 2.07387
241 [37]    valid_0's rmse: 2.07053
242 [38]    valid_0's rmse: 2.06498
243 [39]    valid_0's rmse: 2.06091
```

```
244 [40]    valid_0's rmse: 2.05531
245 [41]    valid_0's rmse: 2.05146
246 [42]    valid_0's rmse: 2.04737
247 [43]    valid_0's rmse: 2.04372
248 [44]    valid_0's rmse: 2.03764
249 [45]    valid_0's rmse: 2.03362
250 [46]    valid_0's rmse: 2.03249
251 [47]    valid_0's rmse: 2.02904
252 [48]    valid_0's rmse: 2.02711
253 [49]    valid_0's rmse: 2.02535
254 [50]    valid_0's rmse: 2.02224
255 [51]    valid_0's rmse: 2.0189
256 [52]    valid_0's rmse: 2.01538
257 [53]    valid_0's rmse: 2.01516
258 [54]    valid_0's rmse: 2.01233
259 [55]    valid_0's rmse: 2.01118
260 [56]    valid_0's rmse: 2.00848
261 [57]    valid_0's rmse: 2.00754
262 [58]    valid_0's rmse: 2.00452
263 [59]    valid_0's rmse: 2.0013
264 [60]    valid_0's rmse: 1.99907
265 [61]    valid_0's rmse: 1.99506
266 [62]    valid_0's rmse: 1.99334
267 [63]    valid_0's rmse: 1.99214
268 [64]    valid_0's rmse: 1.99096
269 [65]    valid_0's rmse: 1.98934
270 [66]    valid_0's rmse: 1.98643
271 [67]    valid_0's rmse: 1.98466
272 [68]    valid_0's rmse: 1.98257
273 [69]    valid_0's rmse: 1.98235
274 [70]    valid_0's rmse: 1.97952
275 [71]    valid_0's rmse: 1.97803
276 [72]    valid_0's rmse: 1.97692
277 [73]    valid_0's rmse: 1.97558
278 [74]    valid_0's rmse: 1.97354
279 [75]    valid_0's rmse: 1.97045
280 [76]    valid_0's rmse: 1.971
281 [77]    valid_0's rmse: 1.96808
282 [78]    valid_0's rmse: 1.9675
283 [79]    valid_0's rmse: 1.96779
284 [80]    valid_0's rmse: 1.96759
285 [81]    valid_0's rmse: 1.96695
286 [82]    valid_0's rmse: 1.96636
287 [83]    valid_0's rmse: 1.96513
```

```
288 [84]     valid_0's rmse: 1.96347
289 [85]     valid_0's rmse: 1.96121
290 [86]     valid_0's rmse: 1.95968
291 [87]     valid_0's rmse: 1.95881
292 [88]     valid_0's rmse: 1.95823
293 [89]     valid_0's rmse: 1.95686
294 [90]     valid_0's rmse: 1.95618
295 [91]     valid_0's rmse: 1.95569
296 [92]     valid_0's rmse: 1.95489
297 [93]     valid_0's rmse: 1.95358
298 [94]     valid_0's rmse: 1.95331
299 [95]     valid_0's rmse: 1.95066
300 [96]     valid_0's rmse: 1.94991
301 [97]     valid_0's rmse: 1.94969
302 [98]     valid_0's rmse: 1.94835
303 [99]     valid_0's rmse: 1.94694
304 [100]    valid_0's rmse: 1.94564
305 [3.41703677 6.37474461 5.23204656 ... 3.35050522 2.
    6044324  4.78135199]
306 0.36835443037974686
307
308 Process finished with exit code 0
309
```