# Feature ablation study

**List of features with indexes in total dataset prepared.**

- [2: 'Length', 4: 'Lex_Prob_Scores_1gram', 6: 'Lex_Prob_Scores_2gram', 8: 'Lex_Prob_Scores_3gram', 10: 'Syntactic_Prob_Scores', 0: 'Class']

| Total feature combination possible | Accuracy (Over Gini index) |
|---|---|
| [2, 4, 0] | 38.4 |
| [2, 6, 0] | 35.6 |
| [2, 8, 0] | 40.6 |
| [2, 10, 0] | 41.8 |
| [4, 6, 0] | 47.4 |
| [4, 8, 0] | 42.4 |
| [4, 10, 0] | 43.2 |
| [6, 8, 0] | 42.2 |
| [6, 10, 0] | 44.4 |
| [8, 10, 0] | 35.6 |
| [2, 4, 6, 0] | 45.4 |
| [2, 4, 8, 0] | 42.8 |
| [2, 4, 10, 0] | 46.8 |
| [2, 6, 8, 0] | 43 |
| [2, 6, 10, 0] | 45.6 |
| [2, 8, 10, 0] | 44.2 |
| [4, 6, 8, 0] | 51.8 |
| [4, 6, 10, 0] | 45.2 |
| [4, 8, 10, 0] | 48.4 |
| [6, 8, 10, 0] | 48.8 |
| [2, 4, 6, 8, 0] | 48.6 |
| [2, 4, 6, 10, 0] | 46.6 |
| [2, 4, 8, 10, 0] | 48.4 |
| [2, 6, 8, 10, 0] | 51.4 |
| [4, 6, 8, 10, 0] | 49 |
| [2, 4, 6, 8, 10, 0] | 50.2 |

- **From above results it can be inferred that feature corresponding to index 4 i.e 'Lex_Prob_Scores_1gram' is most important in improving the accuracy i.e. correctly predicting class of data.**

- **Confusion matrix for every combination**

For set of feature_indexes:  [2, 4, 0]

|  | ABBR | DESC | ENTY | HUM | LOC | NUM |
|---|---|---|---|---|---|---|
| ABBR | 3.00 | 1.00 | 5.00 | 0.00 | 0.00 | 0.00 |
| DESC | 1.00 | 125.00 | 6.00 | 5.00 | 0.00 | 1.00 |
| ENTY | 0.00 | 21.00 | 37.00 | 18.00 | 12.00 | 6.00 |
| HUM | 3.00 | 16.00 | 12.00 | 10.00 | 10.00 | 14.00 |
| LOC | 5.00 | 21.00 | 29.00 | 10.00 | 4.00 | 12.00 |
| NUM | 2.00 | 25.00 | 50.00 | 17.00 | 6.00 | 13.00 |
| Precision | 21.43 | 59.81 | 26.62 | 16.67 | 12.50 | 28.26 |
| Recall | 33.33 | 90.58 | 39.36 | 15.38 | 4.94 | 11.50 |
| f1_score | 26.09 | 72.05 | 31.76 | 16.00 | 7.08 | 16.35 |

For set of feature_indexes: [2, 6, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 6.00   | 2.00  | 0.00  | 1.00  | 0.00  |
| DESC      | 0.0  | 113.00 | 3.00  | 19.00 | 1.00  | 2.00  |
| ENTY      | 0.0  | 32.00  | 23.00 | 17.00 | 10.00 | 12.00 |
| HUM       | 0.0  | 19.00  | 20.00 | 17.00 | 5.00  | 4.00  |
| LOC       | 0.0  | 25.00  | 17.00 | 19.00 | 11.00 | 9.00  |
| NUM       | 0.0  | 33.00  | 38.00 | 19.00 | 9.00  | 14.00 |
| Precision | 0.0  | 49.56  | 22.33 | 18.68 | 29.73 | 34.15 |
| Recall    | 0.0  | 81.88  | 24.47 | 26.15 | 13.58 | 12.39 |
| f1_score  | 0.0  | 61.75  | 23.35 | 21.79 | 18.64 | 18.18 |

For set of feature_indexes: [2, 8, 0]

|           | ABBR   | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|--------|--------|-------|-------|-------|-------|
| ABBR      | 1.00   | 5.00   | 0.00  | 1.00  | 2.00  | 0.00  |
| DESC      | 0.00   | 123.00 | 2.00  | 4.00  | 8.00  | 1.00  |
| ENTY      | 0.00   | 22.00  | 29.00 | 19.00 | 13.00 | 11.00 |
| HUM       | 0.00   | 26.00  | 19.00 | 17.00 | 1.00  | 2.00  |
| LOC       | 0.00   | 37.00  | 14.00 | 13.00 | 13.00 | 4.00  |
| NUM       | 0.00   | 26.00  | 38.00 | 21.00 | 8.00  | 20.00 |
| Precision | 100.00 | 51.46  | 28.43 | 22.67 | 28.89 | 52.63 |
| Recall    | 11.11  | 89.13  | 30.85 | 26.15 | 16.05 | 17.70 |
| f1_score  | 20.00  | 65.25  | 29.59 | 24.29 | 20.63 | 26.49 |

For set of feature_indexes: [2, 10, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 4.00   | 4.00  | 0.00  | 0.00  | 1.00  |
| DESC      | 0.0  | 128.00 | 8.00  | 1.00  | 0.00  | 1.00  |
| ENTY      | 0.0  | 19.00  | 43.00 | 8.00  | 12.00 | 12.00 |
| HUM       | 0.0  | 29.00  | 16.00 | 8.00  | 7.00  | 5.00  |
| LOC       | 0.0  | 31.00  | 32.00 | 3.00  | 13.00 | 2.00  |
| NUM       | 0.0  | 27.00  | 59.00 | 2.00  | 8.00  | 17.00 |
| Precision | 0.0  | 53.78  | 26.54 | 36.36 | 32.50 | 44.74 |
| Recall    | 0.0  | 92.75  | 45.74 | 12.31 | 16.05 | 15.04 |
| f1_score  | 0.0  | 68.09  | 33.59 | 18.39 | 21.49 | 22.52 |

For set of feature_indexes: [4, 6, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 4.00   | 2.00  | 0.00  | 2.00  | 1.00  |
| DESC      | 0.0  | 123.00 | 3.00  | 7.00  | 1.00  | 4.00  |
| ENTY      | 0.0  | 10.00  | 30.00 | 14.00 | 12.00 | 28.00 |
| HUM       | 0.0  | 10.00  | 18.00 | 22.00 | 7.00  | 8.00  |
| LOC       | 0.0  | 14.00  | 21.00 | 13.00 | 26.00 | 7.00  |
| NUM       | 0.0  | 13.00  | 36.00 | 17.00 | 11.00 | 36.00 |
| Precision | 0.0  | 70.69  | 27.27 | 30.14 | 44.07 | 42.86 |
| Recall    | 0.0  | 89.13  | 31.91 | 33.85 | 32.10 | 31.86 |
| f1_score  | 0.0  | 78.85  | 29.41 | 31.88 | 37.14 | 36.55 |

For set of feature_indexes: [4, 8, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 3.00   | 6.00  | 0.00  | 0.00  | 0.00  |
| DESC      | 0.0  | 107.00 | 7.00  | 22.00 | 1.00  | 1.00  |
| ENTY      | 0.0  | 19.00  | 46.00 | 18.00 | 5.00  | 6.00  |
| HUM       | 0.0  | 11.00  | 17.00 | 26.00 | 5.00  | 6.00  |
| LOC       | 0.0  | 27.00  | 16.00 | 14.00 | 20.00 | 4.00  |
| NUM       | 0.0  | 22.00  | 44.00 | 29.00 | 5.00  | 13.00 |
| Precision | 0.0  | 56.61  | 33.82 | 23.85 | 55.56 | 43.33 |
| Recall    | 0.0  | 77.54  | 48.94 | 40.00 | 24.69 | 11.50 |
| f1_score  | 0.0  | 65.44  | 40.00 | 29.89 | 34.19 | 18.18 |

For set of feature_indexes: [4, 10, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 2.00   | 5.00  | 2.00  | 0.00  | 0.00  |
| DESC      | 0.0  | 124.00 | 5.00  | 9.00  | 0.00  | 0.00  |
| ENTY      | 0.0  | 25.00  | 46.00 | 10.00 | 2.00  | 11.00 |
| HUM       | 0.0  | 5.00   | 16.00 | 31.00 | 1.00  | 12.00 |
| LOC       | 0.0  | 25.00  | 39.00 | 2.00  | 4.00  | 11.00 |
| NUM       | 0.0  | 36.00  | 49.00 | 10.00 | 7.00  | 11.00 |
| Precision | 0.0  | 57.14  | 28.75 | 48.44 | 28.57 | 24.44 |
| Recall    | 0.0  | 89.86  | 48.94 | 47.69 | 4.94  | 9.73  |
| f1_score  | 0.0  | 69.86  | 36.22 | 48.06 | 8.42  | 13.92 |

For set of feature_indexes:  [6, 8, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 6.00   | 3.00  | 0.00  | 0.00  | 0.00  |
| DESC      | 0.0  | 125.00 | 3.00  | 1.00  | 2.00  | 7.00  |
| ENTY      | 0.0  | 44.00  | 27.00 | 18.00 | 5.00  | 0.00  |
| HUM       | 0.0  | 26.00  | 6.00  | 25.00 | 6.00  | 2.00  |
| LOC       | 0.0  | 22.00  | 12.00 | 21.00 | 23.00 | 3.00  |
| NUM       | 0.0  | 51.00  | 27.00 | 17.00 | 7.00  | 11.00 |
| Precision | 0.0  | 45.62  | 34.62 | 30.49 | 53.49 | 47.83 |
| Recall    | 0.0  | 90.58  | 28.72 | 38.46 | 28.40 | 9.73  |
| f1_score  | 0.0  | 60.68  | 31.40 | 34.01 | 37.10 | 16.18 |

For set of feature_indexes:  [6, 10, 0]

|           | ABBR | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|--------|-------|-------|-------|-------|
| ABBR      | 0.0  | 4.00   | 2.00  | 1.00  | 1.00  | 1.00  |
| DESC      | 0.0  | 126.00 | 3.00  | 1.00  | 0.00  | 8.00  |
| ENTY      | 0.0  | 20.00  | 29.00 | 18.00 | 14.00 | 13.00 |
| HUM       | 0.0  | 14.00  | 14.00 | 20.00 | 8.00  | 9.00  |
| LOC       | 0.0  | 21.00  | 19.00 | 11.00 | 19.00 | 11.00 |
| NUM       | 0.0  | 19.00  | 34.00 | 11.00 | 21.00 | 28.00 |
| Precision | 0.0  | 61.76  | 28.71 | 32.26 | 30.16 | 40.00 |
| Recall    | 0.0  | 91.30  | 30.85 | 30.77 | 23.46 | 24.78 |
| f1_score  | 0.0  | 73.68  | 29.74 | 31.50 | 26.39 | 30.60 |

For set of feature_indexes:  [8, 10, 0]

|           | ABBR | DESC  | ENTY  | HUM   | LOC   | NUM   |
|-----------|------|-------|-------|-------|-------|-------|
| ABBR      | 0.0  | 4.00  | 0.00  | 4.00  | 0.00  | 1.00  |
| DESC      | 0.0  | 99.00 | 4.00  | 34.00 | 0.00  | 1.00  |
| ENTY      | 0.0  | 26.00 | 25.00 | 36.00 | 3.00  | 4.00  |
| HUM       | 0.0  | 22.00 | 9.00  | 31.00 | 1.00  | 2.00  |
| LOC       | 0.0  | 36.00 | 12.00 | 19.00 | 12.00 | 2.00  |
| NUM       | 0.0  | 28.00 | 34.00 | 40.00 | 0.00  | 11.00 |
| Precision | 0.0  | 46.05 | 29.76 | 18.90 | 75.00 | 52.38 |
| Recall    | 0.0  | 71.74 | 26.60 | 47.69 | 14.81 | 9.73  |
| f1_score  | 0.0  | 56.09 | 28.09 | 27.07 | 24.74 | 16.42 |

For set of feature_indexes:  [2, 4, 6, 0]

|           | ABBR  | DESC   | ENTY  | HUM   | LOC   | NUM   |
|-----------|-------|--------|-------|-------|-------|-------|
| ABBR      | 3.00  | 3.00   | 2.00  | 0.00  | 0.00  | 1.00  |
| DESC      | 1.00  | 123.00 | 4.00  | 3.00  | 1.00  | 6.00  |
| ENTY      | 0.00  | 12.00  | 24.00 | 10.00 | 25.00 | 23.00 |
| HUM       | 0.00  | 10.00  | 19.00 | 15.00 | 12.00 | 9.00  |
| LOC       | 0.00  | 13.00  | 20.00 | 10.00 | 25.00 | 13.00 |
| NUM       | 0.00  | 20.00  | 29.00 | 9.00  | 18.00 | 37.00 |
| Precision | 75.00 | 67.96  | 24.49 | 31.91 | 30.86 | 41.57 |
| Recall    | 33.33 | 89.13  | 25.53 | 23.08 | 30.86 | 32.74 |
| f1_score  | 46.15 | 77.12  | 25.00 | 26.79 | 30.86 | 36.63 |

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For set of feature_indexes:  [2, 4, 8, 0]

              ABBR     DESC     ENTY      HUM      LOC      NUM
ABBR          3.00     2.00     3.00     0.00     0.00     1.00
DESC          1.00   122.00     2.00     9.00     1.00     3.00
ENTY          0.00    26.00    31.00    24.00     9.00     4.00
HUM           3.00     8.00    14.00    25.00     6.00     9.00
LOC           2.00    24.00    12.00    15.00    18.00    10.00
NUM           1.00    26.00    30.00    32.00     9.00    15.00
Precision    30.00    58.65    33.70    23.81    41.86    35.71
Recall       33.33    88.41    32.98    38.46    22.22    13.27
f1_score     31.58    70.52    33.33    29.41    29.03    19.35


For set of feature_indexes:  [2, 4, 10, 0]

              ABBR     DESC     ENTY      HUM      LOC      NUM
ABBR          3.00     1.00     4.00     0.00     0.00     1.00
DESC          0.00   115.00     8.00     6.00     1.00     8.00
ENTY          0.00     6.00    61.00    11.00     7.00     9.00
HUM           1.00     2.00    17.00    24.00     8.00    13.00
LOC           3.00    11.00    33.00     4.00    13.00    17.00
NUM           0.00    11.00    68.00     8.00     8.00    18.00
Precision    42.86    78.77    31.94    45.28    35.14    27.27
Recall       33.33    83.33    64.89    36.92    16.05    15.93
f1_score     37.50    80.99    42.81    40.68    22.03    20.11


For set of feature_indexes:  [2, 6, 8, 0]

              ABBR     DESC     ENTY      HUM      LOC      NUM
ABBR          3.00     3.00     3.00     0.00     0.00     0.00
DESC          2.00   113.00     2.00    17.00     1.00     3.00
ENTY          2.00    28.00    33.00    17.00     0.00    14.00
HUM           0.00    23.00    14.00    23.00     4.00     1.00
LOC           0.00    21.00    18.00    17.00    18.00     7.00
NUM           1.00    36.00    35.00    13.00     3.00    25.00
Precision    37.50    50.45    31.43    26.44    69.23    50.00
Recall       33.33    81.88    35.11    35.38    22.22    22.12
f1_score     35.29    62.43    33.17    30.26    33.64    30.67


For set of feature_indexes:  [2, 6, 10, 0]

              ABBR     DESC     ENTY      HUM      LOC      NUM
ABBR          3.00     1.00     3.00     0.00     1.00     1.00
DESC          1.00   125.00     5.00     2.00     1.00     4.00
ENTY          1.00    13.00    38.00    23.00     5.00    14.00
HUM           0.00    17.00    21.00    17.00     8.00     2.00
LOC           0.00    13.00    23.00    15.00    21.00     9.00
NUM           0.00    23.00    43.00    12.00    11.00    24.00
Precision    60.00    65.10    28.57    24.64    44.68    44.44
Recall       33.33    90.58    40.43    26.15    25.93    21.24
f1_score     42.86    75.76    33.48    25.37    32.81    28.74


For set of feature_indexes:  [2, 8, 10, 0]
              ABBR     DESC     ENTY      HUM      LOC      NUM
ABBR          4.00     3.00     1.00     0.00     0.00     1.00
DESC          1.00   126.00     3.00     6.00     1.00     1.00
ENTY          1.00    31.00    18.00    19.00    13.00    12.00
HUM           1.00    25.00     8.00    16.00    10.00     5.00
LOC           1.00    28.00     9.00    15.00    21.00     7.00
NUM           0.00    34.00    22.00    14.00     7.00    36.00
Precision    50.00    51.01    29.51    22.86    40.38    58.06
Recall       44.44    91.30    19.15    24.62    25.93    31.86
f1_score     47.06    65.45    23.23    23.70    31.58    41.14
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For set of feature_indexes: [4, 6, 8, 0]

             ABBR     DESC     ENTY     HUM      LOC      NUM
ABBR         0.0      5.00     4.00     0.00     0.00     0.00
DESC         0.0    132.00     3.00     1.00     0.00     2.00
ENTY         1.0     25.00    43.00    10.00     8.00     7.00
HUM          0.0      7.00    12.00    39.00     4.00     3.00
LOC          0.0     13.00    17.00    21.00    26.00     4.00
NUM          0.0     25.00    41.00    17.00    11.00    19.00
Precision    0.0     63.77    35.83    44.32    53.06    54.29
Recall       0.0     95.65    45.74    60.00    32.10    16.81
f1_score     0.0     76.52    40.19    50.98    40.00    25.68


For set of feature_indexes:  [4, 6, 10, 0]

              ABBR     DESC     ENTY     HUM      LOC      NUM
ABBR          3.00     1.00     2.00     1.00     2.0      0.00
DESC          0.00   125.00     5.00     5.00     0.0      3.00
ENTY          0.00    13.00    15.00    23.00    23.0     20.00
HUM           0.00     3.00     7.00    34.00     7.0     14.00
LOC           0.00    18.00    10.00    16.00    26.0     11.00
NUM           0.00    21.00    27.00    19.00    23.0     23.00
Precision   100.00    69.06    22.73    34.69    32.1     32.39
Recall       33.33    90.58    15.96    52.31    32.1     20.35
f1_score     50.00    78.37    18.75    41.72    32.1     25.00


For set of feature_indexes:  [4, 8, 10, 0]

              ABBR     DESC     ENTY     HUM      LOC      NUM
ABBR          3.00     1.00     1.00     0.00     3.00     1.00
DESC          0.00   126.00     5.00     5.00     0.00     2.00
ENTY          3.00    21.00    35.00    16.00     8.00    11.00
HUM           2.00     1.00    12.00    29.00     2.00    19.00
LOC           0.00    23.00    13.00    10.00    26.00     9.00
NUM           0.00    21.00    46.00    15.00     8.00    23.00
Precision    37.50    65.28    31.25    38.67    55.32    35.38
Recall       33.33    91.30    37.23    44.62    32.10    20.35
f1_score     35.29    76.13    33.98    41.43    40.62    25.84


For set of feature_indexes:  [6, 8, 10, 0]

             ABBR     DESC     ENTY     HUM      LOC      NUM
ABBR         0.0      4.00     3.00     0.00     0.00     2.00
DESC         1.0    124.00     4.00     1.00     0.00     8.00
ENTY         0.0     28.00    27.00    15.00     6.00    18.00
HUM          0.0     13.00     6.00    22.00     5.00    19.00
LOC          0.0     16.00    13.00    16.00    26.00    10.00
NUM          0.0     22.00    25.00    16.00     5.00    45.00
Precision    0.0     59.90    34.62    31.43    61.90    44.12
Recall       0.0     89.86    28.72    33.85    32.10    39.82
f1_score     0.0     71.88    31.40    32.59    42.28    41.86


For set of feature_indexes:  [2, 4, 6, 8, 0]

              ABBR     DESC     ENTY     HUM      LOC      NUM
ABBR          3.00     1.00     4.00     0.00     0.00     1.00
DESC          1.00   124.00     4.00     2.00     1.00     6.00
ENTY          0.00    27.00    35.00    14.00     4.00    14.00
HUM           0.00     7.00    21.00    22.00     4.00    11.00
LOC           0.00    14.00    23.00    13.00    20.00    11.00
NUM           0.00    18.00    37.00    11.00     8.00    39.00
Precision    75.00    64.92    28.23    35.48    54.05    47.56
Recall        33.33   89.86    37.23    33.85    24.69    34.51
f1_score      46.15   75.38    32.11    34.65    33.90    40.00
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For set of feature_indexes:  [2, 4, 6, 10, 0]

              ABBR      DESC     ENTY      HUM      LOC      NUM
  ABBR        3.00      3.00     2.00     0.00     1.00     0.00
  DESC        1.00    122.00     4.00     6.00     2.00     3.00
  ENTY        0.00     12.00    38.00    18.00    12.00    14.00
  HUM         0.00      5.00    19.00    24.00     9.00     8.00
  LOC         0.00     17.00    21.00     7.00    27.00     9.00
  NUM         0.00     23.00    33.00    14.00    24.00    19.00
  Precision  75.00     67.03    32.48    34.78    36.00    35.85
  Recall     33.33     88.41    40.43    36.92    33.33    16.81
  f1_score   46.15     76.25    36.02    35.82    34.62    22.89

For set of feature_indexes:  [2, 4, 8, 10, 0]

              ABBR      DESC     ENTY      HUM      LOC      NUM
  ABBR        3.00      1.00     4.00     0.00     0.00     1.00
  DESC        0.00    125.00     5.00     6.00     0.00     2.00
  ENTY        0.00     20.00    34.00    20.00     9.00    11.00
  HUM         1.00      4.00    25.00    31.00     2.00     2.00
  LOC         0.00     13.00    21.00    18.00    24.00     5.00
  NUM         0.00     20.00    47.00    16.00     5.00    25.00
  Precision  75.00     68.31    25.00    34.07    60.00    54.35
  Recall     33.33     90.58    36.17    47.69    29.63    22.12
  f1_score   46.15     77.88    29.57    39.74    39.67    31.45

For set of feature_indexes:  [2, 6, 8, 10, 0]

              ABBR      DESC     ENTY      HUM      LOC      NUM
  ABBR        3.00      3.00     1.00     0.00     1.00     1.00
  DESC        0.00    123.00     5.00     4.00     2.00     4.00
  ENTY        1.00      5.00    44.00    20.00     6.00    18.00
  HUM         0.00      8.00    17.00    29.00     6.00     5.00
  LOC         0.00     13.00    23.00    14.00    21.00    10.00
  NUM         0.00     13.00    41.00     6.00    16.00    37.00
  Precision  75.00     74.55    33.59    39.73    40.38    49.33
  Recall     33.33     89.13    46.81    44.62    25.93    32.74
  f1_score   46.15     81.19    39.11    42.03    31.58    39.36

For set of feature_indexes:  [4, 6, 8, 10, 0]

              ABBR      DESC     ENTY      HUM      LOC      NUM
  ABBR         0.0      4.00     4.00     1.00     0.00     0.00
  DESC         0.0    128.00     4.00     2.00     0.00     4.00
  ENTY         0.0     22.00    23.00    29.00     6.00    14.00
  HUM          0.0      1.00     4.00    47.00     3.00    10.00
  LOC          0.0     11.00    11.00    29.00    24.00     6.00
  NUM          0.0     24.00    36.00    22.00     8.00    23.00
  Precision    0.0     67.37    28.05    36.15    58.54    40.35
  Recall       0.0     92.75    24.47    72.31    29.63    20.35
  f1_score     0.0     78.05    26.14    48.21    39.34    27.06

For set of feature_indexes:  [2, 4, 6, 8, 10, 0]

              ABBR      DESC     ENTY      HUM      LOC      NUM
  ABBR        3.00      4.00     1.00     0.00     0.00     1.00
  DESC        1.00    125.00     3.00     2.00     0.00     7.00
  ENTY        0.00     25.00    38.00    13.00     1.00    17.00
  HUM         0.00      7.00    22.00    29.00     2.00     5.00
  LOC         0.00     16.00    25.00     9.00    21.00    10.00
  NUM         0.00     15.00    47.00    11.00     5.00    35.00
  Precision  75.00     65.10    27.94    45.31    72.41    46.67
  Recall     33.33     90.58    40.43    44.62    25.93    30.97
  f1_score   46.15     75.76    33.04    44.96    38.18    37.23
```