Project Report:
Semantic Role Labelling Using Hindi PropBank

TEAM NO-56
MANGLESH PATIDAR 2023201059
DEEPAK SINGH 2023201060

Introduction:
Semantic Role Labelling (SRL) is a fundamental task in Natural Language Processing (NLP) aimed at identifying and classifying the semantic roles of constituents in a sentence, particularly with respect to a predicate or verb. In this project, we focused on the task of Argument Identification for Hindi Semantic Role Labelling. The goal was to determine whether a word in a sentence serves as an argument to a verb or not our next step is to proceed with Argument Classification, where we will assign semantic labels to the identified arguments using a multi-class classifier.

Dataset :
We utilized the Hindi PropBank Dataset for training and evaluation purposes. This dataset comprises hand-annotated sentences with Propbank labels, which represent various semantic roles such as Agent, Theme, Location, Time, Purpose, Reason, Cause, etc.
Here we have Read any.pb file format from HINDI PropBank,
Preprocess the Data using ssfapi.py

Sentence in Hindi contain 1600

Create a word embedding using Word2Vec and FastText
Word2Vec-emb_w2v.csv
FastText-emb.csv

Identification- Identification is done using label column of emb.csv of both methods(word2vec and fasttext) by 2 models(logistic regression and SVC) and using different labels(head, dependency, chunk, etc).

Classification- Classification is done using srl column of emb.csv of both methods(word2vec and fasttext) by 2 models(logistic regression and SVC) and using different labels(head, dependency, chunk, etc).

Combination with Different Parameter for Identification and Classification Logistic Regression Using FastText

Chunk
Confusion Matrix:
[[2176 492]
 [942 754]]

Classification Report:

	precision	recall	f1-score	support
0	0.70	0.82	0.75	2668
1	0.61	0.44	0.51	1696
accuracy			0.67	4364
macro avg	0.65	0.63	0.63	4364
weighted avg	0.66	0.67	0.66	4364

Classification Report:

	precision	recall	f1-score	support
1	0.56	0.29	0.38	303
2	0.59	0.32	0.41	572
3	0.00	0.00	0.00	41
4	0.00	0.00	0.00	118
5	0.00	0.00	0.00	18
6	0.00	0.00	0.00	17
7	0.00	0.00	0.00	11
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	37
10	0.60	0.13	0.21	23
11	0.00	0.00	0.00	7
12	0.00	0.00	0.00	29
13	0.00	0.00	0.00	26
14	0.30	0.04	0.08	201
15	0.00	0.00	0.00	112
16	0.00	0.00	0.00	16
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	35
20	0.00	0.00	0.00	1
21	0.53	0.21	0.30	97
22	0.66	0.93	0.77	2694
accuracy			0.65	4364
macro avg	0.15	0.09	0.10	4364
weighted avg	0.55	0.65	0.57	4364

Dependency-Head, Dependency

Confusion Matrix:
[[2126 548]
 [182 1508]]
Classification Report:

	precision	recall	f1-score	support
0	0.92	0.80	0.85	2674
1	0.73	0.89	0.81	1690
accuracy			0.83	4364
macro avg	0.83	0.84	0.83	4364
weighted avg	0.85	0.83	0.83	4364

Classification Report:

	precision	recall	f1-score	support
ARG-UNDEF	0.00	0.00	0.00	1
ARG0	0.63	0.79	0.70	303
ARG1	0.65	0.80	0.72	599
ARG2	0.00	0.00	0.00	59
ARG2-ATR	0.66	0.18	0.29	104
ARG2-GOL	0.00	0.00	0.00	15
ARG2-LOC	0.00	0.00	0.00	17
ARG2-SOU	0.00	0.00	0.00	11
ARG3	0.00	0.00	0.00	3
ARGM-ADV	0.46	0.14	0.22	42
ARGM-CAU	0.40	0.08	0.14	24
ARGM-DIR	0.00	0.00	0.00	5
ARGM-DIS	0.52	0.39	0.44	31
ARGM-EXT	0.29	0.06	0.11	31
ARGM-LOC	0.49	0.64	0.55	200
ARGM-MNR	0.56	0.43	0.49	104
ARGM-MNS	0.00	0.00	0.00	7
ARGM-NEG	0.00	0.00	0.00	2
ARGM-PRP	0.50	0.55	0.52	33
ARGM-PRX	0.00	0.00	0.00	2
ARGM-TMP	0.65	0.76	0.70	95
accuracy			0.61	1688
macro avg	0.28	0.23	0.23	1688
weighted avg	0.55	0.61	0.56	1688

Dependency-Head

Confusion Matrix:

[[1836 826]

 [18 1684]]

Classification Report:

	precision	recall	f1-score	support
0	0.99	0.69	0.81	2662
1	0.67	0.99	0.80	1702

	precision	recall	f1-score	support
accuracy			0.81	4364
macro avg	0.83	0.84	0.81	4364
weighted avg	0.87	0.81	0.81	4364

Classification Report:

	precision	recall	f1-score	support
0	0.00	0.00	0.00	1
1	0.53	0.47	0.50	316
2	0.51	0.48	0.49	594
3	0.00	0.00	0.00	44
4	0.67	0.02	0.04	103
5	0.00	0.00	0.00	21
6	0.00	0.00	0.00	21
7	0.00	0.00	0.00	18
9	0.50	0.03	0.05	35
10	0.33	0.09	0.14	22
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	24
13	0.50	0.07	0.12	29
14	0.50	0.19	0.27	212
15	0.25	0.05	0.09	113
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	2
18	0.00	0.00	0.00	1
19	0.00	0.00	0.00	46
20	0.00	0.00	0.00	2
21	0.47	0.28	0.35	98
22	0.71	0.90	0.79	2645
accuracy			0.66	4364
macro avg	0.23	0.12	0.13	4364
weighted avg	0.60	0.66	0.61	4364

Dependency:

Confusion Matrix:

[[2141 546]
 [725 952]]

Classification Report:

	precision	recall	f1-score	support
0	0.75	0.80	0.77	2687
1	0.64	0.57	0.60	1677
accuracy			0.71	4364
macro avg	0.69	0.68	0.69	4364
weighted avg	0.70	0.71	0.71	4364

Classification Report:

	precision	recall	f1-score	support
1	0.55	0.45	0.49	314
2	0.57	0.43	0.49	583
3	1.00	0.02	0.04	45
4	0.60	0.03	0.06	99
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	19
7	0.00	0.00	0.00	18
8	0.00	0.00	0.00	1
9	0.00	0.00	0.00	45
10	0.67	0.07	0.12	30
11	0.00	0.00	0.00	4
12	0.00	0.00	0.00	31
13	0.00	0.00	0.00	24
14	0.23	0.02	0.04	224
15	0.43	0.03	0.05	104
16	0.00	0.00	0.00	19
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	46
20	0.00	0.00	0.00	1
21	0.43	0.22	0.29	89
22	0.67	0.91	0.77	2650
accuracy			0.65	4364
macro avg	0.23	0.10	0.11	4364
weighted avg	0.58	0.65	0.58	4364

Head_POS:

Confusion Matrix:

[[2141 539]
 [997 687]]

Classification Report:

	precision	recall	f1-score	support
0	0.68	0.80	0.74	2680
1	0.56	0.41	0.47	1684
accuracy			0.65	4364
macro avg	0.62	0.60	0.60	4364
weighted avg	0.64	0.65	0.63	4364

Classification Report:

	precision	recall	f1-score	support

	precision	recall	f1-score	support
1	0.45	0.16	0.24	312
2	0.58	0.30	0.40	587
3	0.00	0.00	0.00	57
4	0.38	0.08	0.13	77
5	0.00	0.00	0.00	21
6	0.00	0.00	0.00	15
7	0.00	0.00	0.00	13
8	0.00	0.00	0.00	1
9	0.00	0.00	0.00	43
10	0.33	0.03	0.06	31
11	0.00	0.00	0.00	3
12	0.00	0.00	0.00	31
13	0.00	0.00	0.00	39
14	0.21	0.02	0.04	185
15	0.00	0.00	0.00	115
16	0.00	0.00	0.00	10
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	37
20	0.00	0.00	0.00	1
21	0.53	0.18	0.26	108
22	0.65	0.94	0.77	2674
accuracy			0.63	4364
macro avg	0.14	0.08	0.09	4364
weighted avg	0.54	0.63	0.55	4364

Head

Confusion Matrix:

[[2238 461]
 [966 699]]

Classification Report:

	precision	recall	f1-score	support
0	0.70	0.83	0.76	2699
1	0.60	0.42	0.49	1665
accuracy			0.67	4364
macro avg	0.65	0.62	0.63	4364
weighted avg	0.66	0.67	0.66	4364

Classification Report:

	precision	recall	f1-score	support
1	0.45	0.15	0.23	298
2	0.56	0.28	0.38	583
3	0.00	0.00	0.00	52
4	0.57	0.03	0.06	117
5	0.00	0.00	0.00	17

	precision	recall	f1-score	support
6	0.00	0.00	0.00	18
7	0.00	0.00	0.00	12
8	0.00	0.00	0.00	1
9	0.00	0.00	0.00	46
10	0.50	0.07	0.12	30
11	0.00	0.00	0.00	10
12	0.00	0.00	0.00	29
13	1.00	0.04	0.08	25
14	0.09	0.01	0.01	199
15	0.67	0.02	0.04	102
16	0.00	0.00	0.00	13
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	35
21	0.50	0.25	0.33	105
22	0.64	0.94	0.76	2668
accuracy			0.63	4364
macro avg	0.24	0.09	0.10	4364
weighted avg	0.56	0.63	0.54	4364

Postposition

Confusion Matrix:

[[2157 495]
 [975 737]]

Classification Report:

	precision	recall	f1-score	support
0	0.69	0.81	0.75	2652
1	0.60	0.43	0.50	1712
accuracy			0.66	4364
macro avg	0.64	0.62	0.62	4364
weighted avg	0.65	0.66	0.65	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	315
2	0.70	0.24	0.36	565
3	0.00	0.00	0.00	63
4	0.00	0.00	0.00	112
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	19
7	0.00	0.00	0.00	12
8	0.00	0.00	0.00	1
9	0.00	0.00	0.00	45
10	0.00	0.00	0.00	27
11	0.00	0.00	0.00	3

	precision	recall	f1-score	support
12	0.00	0.00	0.00	29
13	0.00	0.00	0.00	25
14	0.00	0.00	0.00	208
15	0.00	0.00	0.00	98
16	0.00	0.00	0.00	11
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	2
19	0.00	0.00	0.00	38
21	0.00	0.00	0.00	114
22	0.63	0.98	0.76	2662
accuracy			0.63	4364
macro avg	0.06	0.06	0.05	4364
weighted avg	0.47	0.63	0.51	4364

Combination with Different Parameter For Identification and Classification Logistic Regression Using Word2Vec

Chunk Result

Confusion Matrix:

[[2349 362]

 [1428 225]]

Classification Report:

	precision	recall	f1-score	support
0	0.62	0.87	0.72	2711
1	0.38	0.14	0.20	1653
accuracy			0.59	4364
macro avg	0.50	0.50	0.46	4364
weighted avg	0.53	0.59	0.53	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	291
2	0.00	0.00	0.00	575
3	0.00	0.00	0.00	60
4	0.00	0.00	0.00	107
5	0.00	0.00	0.00	13
6	0.00	0.00	0.00	18
7	0.00	0.00	0.00	11
8	0.00	0.00	0.00	1
9	0.00	0.00	0.00	31
10	0.00	0.00	0.00	26
11	0.00	0.00	0.00	3
12	0.00	0.00	0.00	28
13	0.00	0.00	0.00	27
14	0.00	0.00	0.00	200

	precision	recall	f1-score	support
15	0.00	0.00	0.00	125
16	0.00	0.00	0.00	15
19	0.00	0.00	0.00	33
20	0.00	0.00	0.00	1
21	0.00	0.00	0.00	104
22	0.62	1.00	0.76	2695
accuracy			0.62	4364
macro avg	0.03	0.05	0.04	4364
weighted avg	0.38	0.62	0.47	4364

Dependency-head, Dependency

Confusion Matrix:
[[2141 533]
 [199 1491]]

Classification Report:

	precision	recall	f1-score	support
0	0.91	0.80	0.85	2674
1	0.74	0.88	0.80	1690
accuracy			0.83	4364
macro avg	0.83	0.84	0.83	4364
weighted avg	0.85	0.83	0.83	4364

Classification Report:

	precision	recall	f1-score	support
ARG-UNDEF	0.00	0.00	0.00	1
ARG0	0.11	0.01	0.02	303
ARG1	0.47	0.94	0.63	599
ARG2	0.00	0.00	0.00	59
ARG2-ATR	0.00	0.00	0.00	104
ARG2-GOL	0.00	0.00	0.00	15
ARG2-LOC	0.00	0.00	0.00	17
ARG2-SOU	0.00	0.00	0.00	11
ARG3	0.00	0.00	0.00	3
ARGM-ADV	0.00	0.00	0.00	42
ARGM-CAU	0.00	0.00	0.00	24
ARGM-DIR	0.00	0.00	0.00	5
ARGM-DIS	0.00	0.00	0.00	31
ARGM-EXT	0.00	0.00	0.00	31
ARGM-LOC	0.33	0.56	0.41	200
ARGM-MNR	0.00	0.00	0.00	104
ARGM-MNS	0.00	0.00	0.00	7
ARGM-NEG	0.00	0.00	0.00	2
ARGM-PRP	0.16	0.61	0.25	33

```
   ARGM-PRX     0.00    0.00    0.00      2
   ARGM-TMP     0.00    0.00    0.00     95

   accuracy                     0.41    1688
  macro avg      0.05    0.10    0.06    1688
weighted avg     0.23    0.41    0.28    1688
```

Dependency-head

```
Confusion Matrix:
[[1796  840]
 [  20 1708]]
```

```
Classification Report:
       precision   recall  f1-score   support

    0      0.99     0.68     0.81     2636
    1      0.67     0.99     0.80     1728

 accuracy                    0.80     4364
 macro avg    0.83    0.83    0.80     4364
weighted avg  0.86    0.80    0.80     4364
```

```
Classification Report:
      precision   recall  f1-score   support

    1     0.00     0.00     0.00      321
    2     0.24     0.19     0.21      575
    3     0.00     0.00     0.00       45
    4     0.00     0.00     0.00      102
    5     0.00     0.00     0.00       22
    6     0.00     0.00     0.00       15
    7     0.00     0.00     0.00       14
    8     0.00     0.00     0.00        1
    9     0.00     0.00     0.00       40
   10     0.00     0.00     0.00       23
   11     0.00     0.00     0.00       11
   12     0.00     0.00     0.00       28
   13     0.00     0.00     0.00       25
   14     0.00     0.00     0.00      221
   15     0.00     0.00     0.00      110
   16     0.00     0.00     0.00       15
   17     0.00     0.00     0.00        1
   18     0.00     0.00     0.00        2
   19     0.00     0.00     0.00       39
   21     0.00     0.00     0.00      102
   22     0.63     0.93     0.75     2652
```

```
     accuracy                 0.59    4364
    macro avg     0.04    0.05    0.05    4364
 weighted avg     0.41    0.59    0.48    4364
```

Dependency

Confusion Matrix:

[[1940 742]

 [994 688]]

```
Classification Report:
        precision   recall  f1-score   support

    0     0.66    0.72    0.69    2682
    1     0.48    0.41    0.44    1682

  accuracy                 0.60    4364
 macro avg     0.57    0.57    0.57    4364
weighted avg     0.59    0.60    0.60    4364
```

```
Classification Report:
        precision   recall  f1-score   support

    0     0.00    0.00    0.00     1
    1     0.00    0.00    0.00    308
    2     0.00    0.00    0.00    624
    3     0.00    0.00    0.00    53
    4     0.00    0.00    0.00    102
    5     0.00    0.00    0.00    22
    6     0.00    0.00    0.00    13
    7     0.00    0.00    0.00    19
    8     0.00    0.00    0.00     1
    9     0.00    0.00    0.00    33
   10     0.00    0.00    0.00    18
   11     0.00    0.00    0.00     4
   12     0.00    0.00    0.00    19
   13     0.00    0.00    0.00    19
   14     0.00    0.00    0.00    178
   15     0.00    0.00    0.00    112
   16     0.00    0.00    0.00    16
   17     0.00    0.00    0.00     1
   18     0.00    0.00    0.00     1
   19     0.00    0.00    0.00    22
   20     0.00    0.00    0.00     1
   21     0.00    0.00    0.00    102
   22     0.62    1.00    0.76    2695

  accuracy                 0.62    4364
 macro avg     0.03    0.04    0.03    4364
weighted avg     0.38    0.62    0.47    4364
```

head_POS

Confusion Matrix:
[[2323 362]
 [1437 242]]

Classification Report:
```
          precision   recall f1-score   support

     0      0.62      0.87     0.72      2685
     1      0.40      0.14     0.21      1679

  accuracy                     0.59      4364
 macro avg    0.51    0.50     0.47      4364
weighted avg   0.53    0.59     0.53      4364
```

Classification Report:
```
          precision   recall f1-score   support

     1      0.00      0.00     0.00       314
     2      0.00      0.00     0.00       615
     3      0.00      0.00     0.00        52
     4      0.00      0.00     0.00        97
     5      0.00      0.00     0.00        22
     6      0.00      0.00     0.00        22
     7      0.00      0.00     0.00        15
     8      0.00      0.00     0.00         2
     9      0.00      0.00     0.00        31
    10      0.00      0.00     0.00        21
    11      0.00      0.00     0.00         5
    12      0.00      0.00     0.00        27
    13      0.00      0.00     0.00        33
    14      0.00      0.00     0.00       188
    15      0.00      0.00     0.00        98
    16      0.00      0.00     0.00        13
    18      0.00      0.00     0.00         4
    19      0.00      0.00     0.00        30
    20      0.00      0.00     0.00         2
    21      0.00      0.00     0.00        92
    22      0.61      1.00     0.76      2681

  accuracy                     0.61      4364
 macro avg    0.03    0.05     0.04      4364
weighted avg   0.38    0.61     0.47      4364
```

head
Confusion Matrix:
[[2702   0]
 [1662   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.62	1.00	0.76	2702
1	0.00	0.00	0.00	1662
accuracy			0.62	4364
macro avg	0.31	0.50	0.38	4364
weighted avg	0.38	0.62	0.47	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	308
2	0.00	0.00	0.00	575
3	0.00	0.00	0.00	55
4	0.00	0.00	0.00	111
5	0.00	0.00	0.00	19
6	0.00	0.00	0.00	16
7	0.00	0.00	0.00	14
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	36
10	0.00	0.00	0.00	27
11	0.00	0.00	0.00	3
12	0.00	0.00	0.00	26
13	0.00	0.00	0.00	27
14	0.00	0.00	0.00	194
15	0.00	0.00	0.00	104
16	0.00	0.00	0.00	13
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	38
20	0.00	0.00	0.00	1
21	0.00	0.00	0.00	94
22	0.62	1.00	0.76	2697
accuracy			0.62	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.38	0.62	0.47	4364

Postposition

Confusion Matrix:
[[2703   0]
 [1661   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.62	1.00	0.76	2703

```
     1     0.00     0.00     0.00     1661

  accuracy                    0.62     4364
  macro avg      0.31     0.50     0.38     4364
weighted avg      0.38     0.62     0.47     4364
```

Classification Report:
```
        precision   recall f1-score   support

     0     0.00     0.00     0.00      1
     1     0.00     0.00     0.00     304
     2     0.00     0.00     0.00     580
     3     0.00     0.00     0.00     59
     4     0.00     0.00     0.00     109
     5     0.00     0.00     0.00     17
     6     0.00     0.00     0.00     11
     7     0.00     0.00     0.00     13
     9     0.00     0.00     0.00     41
    10     0.00     0.00     0.00     22
    11     0.00     0.00     0.00      7
    12     0.00     0.00     0.00     27
    13     0.00     0.00     0.00     29
    14     0.00     0.00     0.00     216
    15     0.00     0.00     0.00     100
    16     0.00     0.00     0.00      8
    18     0.00     0.00     0.00      3
    19     0.00     0.00     0.00     38
    21     0.00     0.00     0.00     103
    22     0.61     1.00     0.76     2676

  accuracy                    0.61     4364
  macro avg      0.03     0.05     0.04     4364
weighted avg      0.38     0.61     0.47     4364
```

Combination with Different Parameter For Identification and Classification Support Vector Classifier Using FastText

Dependecy-head,Dependency
Confusion Matrix:
[[2108 536]
 [209 1511]]

Classification Report:
```
        precision   recall f1-score   support

     0     0.91     0.80     0.85     2644
```

	precision	recall	f1-score	support
1	0.74	0.88	0.80	1720
accuracy			0.83	4364
macro avg	0.82	0.84	0.83	4364
weighted avg	0.84	0.83	0.83	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.43	0.89	0.58	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.29	0.01	0.02	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.78	0.91	0.84	2644
accuracy			0.68	4364
macro avg	0.07	0.08	0.07	4364
weighted avg	0.55	0.68	0.59	4364

Chunk

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720

	precision	recall	f1-score	support
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Dependency-head

Confusion Matrix:

[[1804 840]

 [23 1697]]

Classification Report:

	precision	recall	f1-score	support
0	0.99	0.68	0.81	2644
1	0.67	0.99	0.80	1720
accuracy			0.80	4364
macro avg	0.83	0.83	0.80	4364
weighted avg	0.86	0.80	0.80	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Dependency

Confusion Matrix:

[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:

	precision	recall	f1-score	support

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Head_both dependency
Confusion Matrix:
[[2169 475]
 [255 1465]]

Classification Report:

	precision	recall	f1-score	support
0	0.89	0.82	0.86	2644
1	0.76	0.85	0.80	1720
accuracy			0.83	4364
macro avg	0.82	0.84	0.83	4364
weighted avg	0.84	0.83	0.83	4364

Classification Report:

	precision	recall	f1-score	support
1	0.56	0.67	0.61	305
2	0.58	0.70	0.64	618
3	0.00	0.00	0.00	51
4	0.24	0.04	0.07	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.50	0.04	0.08	24
11	0.00	0.00	0.00	5
12	0.33	0.03	0.05	34
13	0.00	0.00	0.00	31
14	0.27	0.01	0.03	214
15	0.40	0.02	0.03	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.47	0.21	0.29	91
22	0.76	0.91	0.83	2644
accuracy			0.70	4364
macro avg	0.19	0.12	0.12	4364
weighted avg	0.63	0.70	0.65	4364

Head-POS

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:
	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:
	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618

	precision	recall	f1-score	support
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Head

Confusion Matrix:
[[2273 371]
 [1102 618]]

Classification Report:

	precision	recall	f1-score	support
0	0.67	0.86	0.76	2644
1	0.62	0.36	0.46	1720
accuracy			0.66	4364
macro avg	0.65	0.61	0.61	4364
weighted avg	0.65	0.66	0.64	4364

Classification Report:

	precision	recall	f1-score	support
1	0.48	0.15	0.23	305
2	0.67	0.22	0.33	618
3	0.00	0.00	0.00	51
4	0.29	0.02	0.04	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8

	precision	recall	f1-score	support
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.50	0.04	0.08	24
11	0.00	0.00	0.00	5
12	0.25	0.03	0.05	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.41	0.18	0.25	91
22	0.63	0.96	0.76	2644
accuracy			0.63	4364
macro avg	0.15	0.07	0.08	4364
weighted avg	0.53	0.63	0.53	4364

Head_with_chunk

Confusion Matrix:

[[2264 380]
 [1099 621]]

Classification Report:

	precision	recall	f1-score	support
0	0.67	0.86	0.75	2644
1	0.62	0.36	0.46	1720
accuracy			0.66	4364
macro avg	0.65	0.61	0.61	4364
weighted avg	0.65	0.66	0.64	4364

Classification Report:

	precision	recall	f1-score	support
1	0.50	0.15	0.23	305
2	0.67	0.22	0.33	618
3	0.00	0.00	0.00	51
4	0.29	0.02	0.04	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.50	0.04	0.08	24

	precision	recall	f1-score	support
11	0.00	0.00	0.00	5
12	0.25	0.03	0.05	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.41	0.18	0.25	91
22	0.63	0.96	0.76	2644
accuracy			0.63	4364
macro avg	0.15	0.07	0.08	4364
weighted avg	0.53	0.63	0.53	4364

head_with_dependency-head

Confusion Matrix:

[[2024 620]
 [202 1518]]

Classification Report:

	precision	recall	f1-score	support
0	0.91	0.77	0.83	2644
1	0.71	0.88	0.79	1720
accuracy			0.81	4364
macro avg	0.81	0.82	0.81	4364
weighted avg	0.83	0.81	0.81	4364

Classification Report:

	precision	recall	f1-score	support
1	0.54	0.38	0.45	305
2	0.54	0.39	0.45	618
3	0.00	0.00	0.00	51
4	0.25	0.02	0.04	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.50	0.04	0.08	24
11	0.00	0.00	0.00	5
12	0.33	0.03	0.05	34
13	0.00	0.00	0.00	31
14	0.27	0.01	0.03	214
15	0.00	0.00	0.00	129

	precision	recall	f1-score	support
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.45	0.21	0.29	91
22	0.67	0.92	0.78	2644
accuracy			0.65	4364
macro avg	0.16	0.09	0.10	4364
weighted avg	0.56	0.65	0.58	4364

head_with_dependency

Confusion Matrix:

[[2083 561]
 [625 1095]]

Classification Report:

	precision	recall	f1-score	support
0	0.77	0.79	0.78	2644
1	0.66	0.64	0.65	1720
accuracy			0.73	4364
macro avg	0.72	0.71	0.71	4364
weighted avg	0.73	0.73	0.73	4364

Classification Report:

	precision	recall	f1-score	support
1	0.60	0.32	0.42	305
2	0.66	0.33	0.44	618
3	0.00	0.00	0.00	51
4	0.22	0.02	0.04	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	1.00	0.04	0.08	24
11	0.00	0.00	0.00	5
12	0.33	0.03	0.05	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2

```
    21    0.46    0.18    0.25      91
    22    0.66    0.95    0.78    2644

  accuracy                0.65    4364
 macro avg    0.18    0.09    0.09    4364
weighted avg    0.56    0.65    0.57    4364
```

head_with_head_POS
Confusion Matrix:
[[2256 388]
 [1081 639]]

```
Classification Report:
        precision   recall  f1-score   support

     0    0.68    0.85    0.75    2644
     1    0.62    0.37    0.47    1720

  accuracy                0.66    4364
 macro avg    0.65    0.61    0.61    4364
weighted avg    0.65    0.66    0.64    4364
```

```
Classification Report:
        precision   recall  f1-score   support

     1    0.48    0.15    0.23     305
     2    0.67    0.22    0.33     618
     3    0.00    0.00    0.00      51
     4    0.29    0.02    0.04      93
     5    0.00    0.00    0.00      14
     6    0.00    0.00    0.00       6
     7    0.00    0.00    0.00       8
     8    0.00    0.00    0.00       2
     9    0.00    0.00    0.00      38
    10    0.50    0.04    0.08      24
    11    0.00    0.00    0.00       5
    12    0.25    0.03    0.05      34
    13    0.00    0.00    0.00      31
    14    0.00    0.00    0.00     214
    15    0.00    0.00    0.00     129
    16    0.00    0.00    0.00      12
    17    0.00    0.00    0.00       1
    18    0.00    0.00    0.00       3
    19    0.00    0.00    0.00      39
    20    0.00    0.00    0.00       2
    21    0.40    0.18    0.24      91
    22    0.63    0.96    0.76    2644
```

	precision	recall	f1-score	support
accuracy			0.63	4364
macro avg	0.15	0.07	0.08	4364
weighted avg	0.53	0.63	0.53	4364

postposition

Confusion Matrix:

[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Combination with Different Parameter For Identification and Classification Support Vector Classifier Using Word2Vec

Dependecy-head,Dependency

Confusion Matrix:
[[2108 536]
 [209 1511]]

Classification Report:

	precision	recall	f1-score	support
0	0.91	0.80	0.85	2644
1	0.74	0.88	0.80	1720
accuracy			0.83	4364
macro avg	0.82	0.84	0.83	4364
weighted avg	0.84	0.83	0.83	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.43	0.89	0.58	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.29	0.01	0.02	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.78	0.91	0.84	2644
accuracy			0.68	4364
macro avg	0.07	0.08	0.07	4364
weighted avg	0.55	0.68	0.59	4364

Chunk

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Dependecy-head
Confusion Matrix:

```
[[1804  840]
 [  23 1697]]
```

Classification Report:

	precision	recall	f1-score	support
0	0.99	0.68	0.81	2644
1	0.67	0.99	0.80	1720
accuracy			0.80	4364
macro avg	0.83	0.83	0.80	4364
weighted avg	0.86	0.80	0.80	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Dependency

Confusion Matrix:
```
[[2644   0]
 [1720   0]]
```

Classification Report:

	precision	recall	f1-score	support

```
        0    0.61    1.00    0.75    2644
        1    0.00    0.00    0.00    1720

  accuracy                    0.61    4364
 macro avg    0.30    0.50    0.38    4364
weighted avg    0.37    0.61    0.46    4364
```

```
Classification Report:
        precision    recall  f1-score   support

        1    0.00    0.00    0.00    305
        2    0.00    0.00    0.00    618
        3    0.00    0.00    0.00    51
        4    0.00    0.00    0.00    93
        5    0.00    0.00    0.00    14
        6    0.00    0.00    0.00    6
        7    0.00    0.00    0.00    8
        8    0.00    0.00    0.00    2
        9    0.00    0.00    0.00    38
       10    0.00    0.00    0.00    24
       11    0.00    0.00    0.00    5
       12    0.00    0.00    0.00    34
       13    0.00    0.00    0.00    31
       14    0.00    0.00    0.00    214
       15    0.00    0.00    0.00    129
       16    0.00    0.00    0.00    12
       17    0.00    0.00    0.00    1
       18    0.00    0.00    0.00    3
       19    0.00    0.00    0.00    39
       20    0.00    0.00    0.00    2
       21    0.00    0.00    0.00    91
       22    0.61    1.00    0.75    2644

  accuracy                    0.61    4364
 macro avg    0.03    0.05    0.03    4364
weighted avg    0.37    0.61    0.46    4364
```

Head_both_dependency

```
Confusion Matrix:
[[2108  536]
 [ 209 1511]]
```

```
Classification Report:
        precision    recall  f1-score   support

        0    0.91    0.80    0.85    2644
        1    0.74    0.88    0.80    1720
```

```
    accuracy                  0.83    4364
   macro avg      0.82    0.84    0.83    4364
weighted avg      0.84    0.83    0.83    4364
```

Classification Report:
```
          precision   recall  f1-score  support

      1     0.00     0.00     0.00       305
      2     0.43     0.89     0.58       618
      3     0.00     0.00     0.00        51
      4     0.00     0.00     0.00        93
      5     0.00     0.00     0.00        14
      6     0.00     0.00     0.00         6
      7     0.00     0.00     0.00         8
      8     0.00     0.00     0.00         2
      9     0.00     0.00     0.00        38
     10     0.00     0.00     0.00        24
     11     0.00     0.00     0.00         5
     12     0.00     0.00     0.00        34
     13     0.00     0.00     0.00        31
     14     0.22     0.01     0.02       214
     15     0.00     0.00     0.00       129
     16     0.00     0.00     0.00        12
     17     0.00     0.00     0.00         1
     18     0.00     0.00     0.00         3
     19     0.00     0.00     0.00        39
     20     0.00     0.00     0.00         2
     21     0.00     0.00     0.00        91
     22     0.78     0.91     0.84      2644

   accuracy                  0.68      4364
  macro avg     0.07     0.08     0.07      4364
weighted avg     0.54     0.68     0.59      4364
```

Head_POS

Confusion Matrix:
```
[[2644   0]
 [1720   0]]
```

Classification Report:
```
          precision   recall  f1-score  support

      0     0.61     1.00     0.75      2644
      1     0.00     0.00     0.00      1720

   accuracy                  0.61      4364
  macro avg     0.30     0.50     0.38      4364
weighted avg     0.37     0.61     0.46      4364
```

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Head

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364
weighted avg	0.37	0.61	0.46	4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Head_with-Chunk

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644

```
       1     0.00    0.00    0.00     1720

  accuracy                     0.61    4364
  macro avg      0.30    0.50    0.38    4364
weighted avg     0.37    0.61    0.46    4364
```

Classification Report:

	precision	recall	f1-score	support
1	0.56	0.71	0.62	320
2	0.55	0.79	0.65	589
3	0.00	0.00	0.00	52
4	0.71	0.34	0.46	104
5	0.00	0.00	0.00	18
6	0.00	0.00	0.00	17
7	0.00	0.00	0.00	9
8	0.00	0.00	0.00	2
9	0.45	0.13	0.20	39
10	0.60	0.18	0.27	17
11	1.00	0.20	0.33	5
12	0.59	0.38	0.47	26
13	0.33	0.08	0.13	25
14	0.46	0.42	0.44	195
15	0.72	0.44	0.54	110
16	0.00	0.00	0.00	15
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	2
19	0.00	0.00	0.00	46
20	0.00	0.00	0.00	1
21	0.70	0.71	0.70	97
22	0.61	0.37	0.55	2644

```
  accuracy                     0.56    4364
  macro avg      0.32    0.21    0.23    4364
weighted avg     0.51    0.56    0.52    4364
```

Head_with_ both_dependency
Confusion Matrix:
[[1804 840]
 [23 1697]]

Classification Report:

	precision	recall	f1-score	support
0	0.99	0.68	0.81	2644
1	0.67	0.99	0.80	1720

```
  accuracy                     0.80    4364
  macro avg      0.83    0.83    0.80    4364
```

weighted avg   0.86   0.80   0.80   4364

Classification Report:

         precision recall f1-score support

     1   0.00   0.00   0.00   305
     2   0.00   0.00   0.00   618
     3   0.00   0.00   0.00   51
     4   0.00   0.00   0.00   93
     5   0.00   0.00   0.00   14
     6   0.00   0.00   0.00   6
     7   0.00   0.00   0.00   8
     8   0.00   0.00   0.00   2
     9   0.00   0.00   0.00   38
    10   0.00   0.00   0.00   24
    11   0.00   0.00   0.00   5
    12   0.00   0.00   0.00   34
    13   0.00   0.00   0.00   31
    14   0.00   0.00   0.00   214
    15   0.00   0.00   0.00   129
    16   0.00   0.00   0.00   12
    17   0.00   0.00   0.00   1
    18   0.00   0.00   0.00   3
    19   0.00   0.00   0.00   39
    20   0.00   0.00   0.00   2
    21   0.00   0.00   0.00   91
    22   0.61   1.00   0.75   2644

  accuracy   0.61   4364
 macro avg   0.03   0.05   0.03   4364
weighted avg   0.37   0.61   0.46   4364

Head_with_dependency
Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

         precision recall f1-score support

     0   0.61   1.00   0.75   2644
     1   0.00   0.00   0.00   1720

  accuracy   0.61   4364
 macro avg   0.30   0.50   0.38   4364
weighted avg   0.37   0.61   0.46   4364

Classification Report:

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364

Head_with_head_POS

Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:

	precision	recall	f1-score	support
0	0.61	1.00	0.75	2644
1	0.00	0.00	0.00	1720
accuracy			0.61	4364
macro avg	0.30	0.50	0.38	4364

weighted avg   0.37   0.61   0.46   4364

Classification Report:
        precision   recall f1-score   support

        1   0.00   0.00   0.00   305
        2   0.00   0.00   0.00   618
        3   0.00   0.00   0.00   51
        4   0.00   0.00   0.00   93
        5   0.00   0.00   0.00   14
        6   0.00   0.00   0.00   6
        7   0.00   0.00   0.00   8
        8   0.00   0.00   0.00   2
        9   0.00   0.00   0.00   38
       10   0.00   0.00   0.00   24
       11   0.00   0.00   0.00   5
       12   0.00   0.00   0.00   34
       13   0.00   0.00   0.00   31
       14   0.00   0.00   0.00   214
       15   0.00   0.00   0.00   129
       16   0.00   0.00   0.00   12
       17   0.00   0.00   0.00   1
       18   0.00   0.00   0.00   3
       19   0.00   0.00   0.00   39
       20   0.00   0.00   0.00   2
       21   0.00   0.00   0.00   91
       22   0.61   1.00   0.75   2644

   accuracy   0.61   4364
  macro avg   0.03   0.05   0.03   4364
weighted avg   0.37   0.61   0.46   4364

Postposition
Confusion Matrix:
[[2644   0]
 [1720   0]]

Classification Report:
        precision   recall f1-score   support

        0   0.61   1.00   0.75   2644
        1   0.00   0.00   0.00   1720

   accuracy   0.61   4364
  macro avg   0.30   0.50   0.38   4364
weighted avg   0.37   0.61   0.46   4364

Classification Report:
        precision   recall f1-score   support

	precision	recall	f1-score	support
1	0.00	0.00	0.00	305
2	0.00	0.00	0.00	618
3	0.00	0.00	0.00	51
4	0.00	0.00	0.00	93
5	0.00	0.00	0.00	14
6	0.00	0.00	0.00	6
7	0.00	0.00	0.00	8
8	0.00	0.00	0.00	2
9	0.00	0.00	0.00	38
10	0.00	0.00	0.00	24
11	0.00	0.00	0.00	5
12	0.00	0.00	0.00	34
13	0.00	0.00	0.00	31
14	0.00	0.00	0.00	214
15	0.00	0.00	0.00	129
16	0.00	0.00	0.00	12
17	0.00	0.00	0.00	1
18	0.00	0.00	0.00	3
19	0.00	0.00	0.00	39
20	0.00	0.00	0.00	2
21	0.00	0.00	0.00	91
22	0.61	1.00	0.75	2644
accuracy			0.61	4364
macro avg	0.03	0.05	0.03	4364
weighted avg	0.37	0.61	0.46	4364