

Q] Report precision, recall, and F-score measures on test sets using models based on the gini index, mis-classification error and cross-entropy.

Q] Report results of feature ablation study and state which feature has contributed most towards correctly predicting a particular class

Mapping for target class

{'ABBR': 0, 'DESC': 1, 'ENTY': 2, 'HUM': 3, 'LOC': 4, 'NUM': 5}

Datset Attribute

---

| Targte class | Raw Question | Question After preprocessing | length of question | Lexical | syntactical |
|--------------|--------------|------------------------------|--------------------|---------|-------------|
|--------------|--------------|------------------------------|--------------------|---------|-------------|

---

first 5 rows from dataset after processing the question

Row 0

1

How did serfdom develop in and then leave Russia ?

['how', 'did', 'serfdom', 'develop', 'in', 'and', 'then', 'leave', 'russia']

9

None

None

Row 1

2

What films featured the character Popeye Doyle ?

['what', 'films', 'featured', 'the', 'character', 'popeye', 'doyle']

7

None

None

Row 2

1

How can I find a list of celebrities ' real names ?

['how', 'can', 'find', 'list', 'of', 'celebrities', 'real', 'names']

8

None

None

Row 3

2

What fowl grabs the spotlight after the Chinese Year of the Monkey ?

['what', 'fowl', 'grabs', 'the', 'spotlight', 'after', 'the', 'chinese', 'year', 'of', 'the', 'monkey']

12

None

None

Row 4

0

What is the full form of .com ?

['what', 'is', 'the', 'full', 'form', 'of', 'com']

7

None

None

first 5 rows from dataset after extracting lexical and syntactic data

Row 0

1

How did serfdom develop in and then leave Russia ?

['how', 'did', 'serfdom', 'develop', 'in', 'and', 'then', 'leave', 'russia']

9

['how', 'did', 'in', 'and', 'then']

['WRB', 'VBD', 'IN', 'CC', 'RB']

Row 1

2

What films featured the character Popeye Doyle ?

['what', 'films', 'featured', 'the', 'character', 'popeye', 'doyle']

7

['what', 'the', 'character']

['WP', 'DT', 'NN']

Row 2

1

How can I find a list of celebrities ' real names ?

['how', 'can', 'find', 'list', 'of', 'celebrities', 'real', 'names']

8

['how', 'can', 'find', 'list', 'of', 'real', 'names']

['WRB', 'MD', 'VB', 'NN', 'IN', 'JJ', 'NNS']

Row 3

2

What fowl grabs the spotlight after the Chinese Year of the Monkey ?

['what', 'fowl', 'grabs', 'the', 'spotlight', 'after', 'the', 'chinese', 'year', 'of', 'the', 'monkey']

12

['what', 'the', 'after', 'the', 'chinese', 'year', 'of', 'the']

['WP', 'DT', 'IN', 'DT', 'JJ', 'NN', 'IN', 'DT']

Row 4

0

What is the full form of .com ?

['what', 'is', 'the', 'full', 'form', 'of', 'com']

7

['what', 'is', 'the', 'full', 'form', 'of', 'com']

['WP', 'VBZ', 'DT', 'JJ', 'NN', 'IN', 'NN']

first 5 rows from training dataset after probability calculations

Row 0

1

How did serfdom develop in and then leave Russia ?

['how', 'did', 'serfdom', 'develop', 'in', 'and', 'then', 'leave', 'russia']

9

7.734196724847904e-08

0.00013266783798205007

Row 1

2

What films featured the character Popeye Doyle ?

['what', 'films', 'featured', 'the', 'character', 'popeye', 'doyle']

7

0.0013101844897959183

0.7824579360530675

Row 2

1

How can I find a list of celebrities ' real names ?

['how', 'can', 'find', 'list', 'of', 'celebrities', 'real', 'names']

8

2.7404778811929026e-13

2.4588954000112153e-05

Row 3

2

What fowl grabs the spotlight after the Chinese Year of the Monkey ?

['what', 'fowl', 'grabs', 'the', 'spotlight', 'after', 'the', 'chinese', 'year', 'of', 'the', 'monkey']

12

4.671329086249706e-10

0.08633452119520049

Row 4

0

What is the full form of .com ?

['what', 'is', 'the', 'full', 'form', 'of', 'com']

7

1.75915223862936e-12

0.02025786748867755

Mapping for target class

{'ABBR': 0, 'DESC': 1, 'ENTY': 2, 'HUM': 3, 'LOC': 4, 'NUM': 5}

Datataset Attribute

---

| Targte class   Raw Question   Question After preprocessing   length of question   Lexical   syntactical |
|---|
|---|

---

first 5 rows from dataset after processing the question

Row 0

5

How far is it from Denver to Aspen ?

['how', 'far', 'is', 'it', 'from', 'denver', 'to', 'aspen']

8

None

None

Row 1

4

What county is Modesto , California in ?

['what', 'county', 'is', 'modesto', 'california', 'in']

6

None

None

Row 2

3

Who was Galileo ?

['who', 'was', 'galileo']

3

None

None

Row 3

1

What is an atom ?

['what', 'is', 'an', 'atom']

4

None

None

Row 4

5

When did Hawaii become a state ?

['when', 'did', 'hawaii', 'become', 'state']

5

None

None

first 5 rows from dataset after extracting lexical and syntactic data

Row 0

5

How far is it from Denver to Aspen ?

['how', 'far', 'is', 'it', 'from', 'denver', 'to', 'aspen']

8

['how', 'far', 'is', 'it', 'from', 'denver', 'to', 'aspen']

['WRB', 'RB', 'VBZ', 'PRP', 'IN', 'NN', 'TO', 'VB']

Row 1

4

What county is Modesto , California in ?

['what', 'county', 'is', 'modesto', 'california', 'in']

6

['what', 'county', 'is', 'modesto', 'california', 'in']

['WP', 'NN', 'VBZ', 'NN', 'NN', 'IN']

Row 2

3

Who was Galileo ?

['who', 'was', 'galileo']

3

['who', 'was', 'galileo']

['WP', 'VBD', 'NN']

Row 3

1

What is an atom ?

['what', 'is', 'an', 'atom']

4

['what', 'is', 'an', 'atom']

['WP', 'VBZ', 'DT', 'NN']

Row 4

5

When did Hawaii become a state ?

['when', 'did', 'hawaii', 'become', 'state']

5

['when', 'did', 'hawaii', 'become', 'state']

['WRB', 'VBD', 'NN', 'NN', 'NN']

first 5 rows from testing dataset after probability calculations

Row 0

5

How far is it from Denver to Aspen ?

['how', 'far', 'is', 'it', 'from', 'denver', 'to', 'aspen']

8

5.4853999922335294e-08

0.0008350159563586373

Row 1

4

What county is Modesto , California in ?

['what', 'county', 'is', 'modesto', 'california', 'in']

6

1.1856409585819994e-06

1.5584426076095899

Row 2

3

Who was Galileo ?

['who', 'was', 'galileo']

3

0.058518982365854205

0.469523748848022

Row 3

1

What is an atom ?

['what', 'is', 'an', 'atom']

4

0.005470750385762961

0.7515745108399025

Row 4

5

When did Hawaii become a state ?

['when', 'did', 'hawaii', 'become', 'state']

5

2.907471246516451e-06

0.6002377132007415

/home/omkar/Dropbox/IITP/IITP\_Assignment\_Quiz/SEM1/AI/Assignment\_4/dt.py:239:

VisibleDeprecationWarning: Creating an ndarray from ragged nested sequences (which is a list-or-tuple of lists-or-tuples-or ndarrays with different lengths or shapes) is deprecated. If you meant to do this, you must specify 'dtype=object' when creating the ndarray.

actual\_target=np.array(test\_data\_after\_prob\_cal).T.tolist()[0]

gini

Building Tree ...

Predicting test data ...

Accuracy 15

ABBR 0| DESC 1| ENTY 2| HUM 3| LOC 4| NUM 5

precision [0.0, 0.18, 0.11920529801324503, 0.14213197969543148, 0.17142857142857143, 0.26666666666666666]

recall [0.0, 0.06521739130434782, 0.19148936170212766, 0.4307692307692308, 0.14814814814814814, 0.07079646017699115]

f-score [0.0, 0.09574468085106382, 0.1469387755102041, 0.2137404580152672, 0.15894039735099338, 0.11188811188811189]

support [9, 138, 94, 65, 81, 113]

entropy

Building Tree ...

Predicting test data ...

Accuracy 16.6

ABBR 0| DESC 1| ENTY 2| HUM 3| LOC 4| NUM 5

precision [0.0, 0.23255813953488372, 0.14507772020725387, 0.1568627450980392, 0.2033898305084746, 0.23076923076923078]

recall [0.0, 0.07246376811594203, 0.2978723404255319, 0.36923076923076925, 0.14814814814814814, 0.07964601769911504]

f-score [0.0, 0.11049723756906078, 0.19512195121951217, 0.22018348623853212, 0.17142857142857143, 0.11842105263157895]

support [9, 138, 94, 65, 81, 113]

ce

Building Tree ...

Predicting test data ...

Accuracy 18.6

ABBR 0| DESC 1| ENTY 2| HUM 3| LOC 4| NUM 5

precision [0.015625, 0.35135135135135137, 0.19402985074626866, 0.15, 0.2028985507246377, 0.20512820512820512]

recall [0.11111111111111111, 0.18840579710144928, 0.2765957446808511, 0.27692307692307694, 0.1728395061728395, 0.07079646017699115]

f-score [0.0273972602739726, 0.24528301886792453, 0.2280701754385965, 0.19459459459459458, 0.18666666666666665, 0.10526315789473684]

support [9, 138, 94, 65, 81, 113]

>>>

Q] Show whether errors propagated by one model are corrected by other models or not. If yes, then report how many percent of samples are corrected.

Ex. Observe how many samples are mis-classified using gini index based model but correctly classified by mis-classification error and cross-entropy based model.

samples misclassified by gini but correctly classified by entropy 38

samples misclassified by gini but correctly classified by ce 57