Epoch 1/20

1682/1682 [==============================] - ETA: 0s - loss: 18.4826 - accuracy: 0.50262024-05-27 06:15:43.820723: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 21018624000 exceeds 10% of free system memory.

2024-05-27 06:18:07.457799: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2155560960 exceeds 10% of free system memory.

2024-05-27 06:18:08.890802: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2463498240 exceeds 10% of free system memory.

1682/1682 [==============================] - 2321s 1s/step - loss: 18.4826 - accuracy: 0.5026 - val\_loss: 12.8834 - val\_accuracy: 0.5243 - lr: 1.0000e-05

Epoch 2/20

1682/1682 [==============================] - ETA: 0s - loss: 8.8739 - accuracy: 0.50802024-05-27 06:52:41.455181: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 21018624000 exceeds 10% of free system memory.

2024-05-27 06:53:26.120123: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2155560960 exceeds 10% of free system memory.

1682/1682 [==============================] - 2119s 1s/step - loss: 8.8739 - accuracy: 0.5080 - val\_loss: 5.6217 - val\_accuracy: 0.5339 - lr: 1.0000e-05

Epoch 3/20

1682/1682 [==============================] - 1627s 966ms/step - loss: 3.6776 - accuracy: 0.5141 - val\_loss: 2.2415 - val\_accuracy: 0.5342 - lr: 1.0000e-05

Epoch 4/20

1682/1682 [==============================] - 1287s 765ms/step - loss: 1.5417 - accuracy: 0.5328 - val\_loss: 1.0737 - val\_accuracy: 0.5546 - lr: 1.0000e-05

Epoch 5/20

1682/1682 [==============================] - 1254s 746ms/step - loss: 0.8824 - accuracy: 0.5662 - val\_loss: 0.7611 - val\_accuracy: 0.5623 - lr: 1.0000e-05

Epoch 6/20

1682/1682 [==============================] - 1299s 772ms/step - loss: 0.7077 - accuracy: 0.5978 - val\_loss: 0.6953 - val\_accuracy: 0.5510 - lr: 1.0000e-05

Epoch 7/20

1682/1682 [==============================] - 1346s 800ms/step - loss: 0.6538 - accuracy: 0.6292 - val\_loss: 0.6884 - val\_accuracy: 0.5476 - lr: 1.0000e-05

Epoch 8/20

1682/1682 [==============================] - 1328s 789ms/step - loss: 0.6207 - accuracy: 0.6645 - val\_loss: 0.7027 - val\_accuracy: 0.5458 - lr: 1.0000e-05

Epoch 9/20

1682/1682 [==============================] - 1265s 752ms/step - loss: 0.5817 - accuracy: 0.7022 - val\_loss: 0.7312 - val\_accuracy: 0.5489 - lr: 1.0000e-05

Epoch 10/20

1682/1682 [==============================] - 1267s 753ms/step - loss: 0.5367 - accuracy: 0.7415 - val\_loss: 0.7901 - val\_accuracy: 0.5465 - lr: 1.0000e-05

Epoch 11/20

1682/1682 [==============================] - 1317s 783ms/step - loss: 0.4920 - accuracy: 0.7757 - val\_loss: 0.8215 - val\_accuracy: 0.5526 - lr: 1.0000e-05

Epoch 12/20

1682/1682 [==============================] - ETA: 0s - loss: 0.4513 - accuracy: 0.8048

Epoch 12: ReduceLROnPlateau reducing learning rate to 5.999999848427251e-06.

1682/1682 [==============================] - 1316s 782ms/step - loss: 0.4513 - accuracy: 0.8048 - val\_loss: 0.8574 - val\_accuracy: 0.5570 - lr: 1.0000e-05

2883/2883 [==============================] - 34s 11ms/step

Evaluation Metrics:

Precision: 0.5303

Recall: 0.8460

F1 Score: 0.6520

ROC AUC: 0.5962

PR AUC: 0.5913

MCC: 0.1206

y\_pred = (test\_scores > 0.6).astype(int)

...: y\_true = y\_test.astype(int)

...:

...: # Calculate evaluation metrics

...: precision = precision\_score(y\_true, y\_pred)

...: recall = recall\_score(y\_true, y\_pred)

...: f1 = f1\_score(y\_true, y\_pred)

...: roc\_auc = roc\_auc\_score(y\_true, test\_scores)

...: pr\_auc = average\_precision\_score(y\_true, test\_scores)

...: mcc = matthews\_corrcoef(y\_true, y\_pred)

...:

...: # Confusion Matrix

...: conf\_matrix = confusion\_matrix(y\_true, y\_pred)

...:

...: # Display evaluation metrics

...: print("\nEvaluation Metrics:")

...: print(f'Precision: {precision:.4f}')

...: print(f'Recall: {recall:.4f}')

...: print(f'F1 Score: {f1:.4f}')

...: print(f'ROC AUC: {roc\_auc:.4f}')

...: print(f'PR AUC: {pr\_auc:.4f}')

...: print(f'MCC: {mcc:.4f}')

Evaluation Metrics:

Precision: 0.6218

Recall: 0.3493

F1 Score: 0.4473

ROC AUC: 0.5962

PR AUC: 0.5913

MCC: 0.1523

In [4]: y\_pred = (test\_scores > 0.7).astype(int)

...: y\_true = y\_test.astype(int)

...:

...: # Calculate evaluation metrics

...: precision = precision\_score(y\_true, y\_pred)

...: recall = recall\_score(y\_true, y\_pred)

...: f1 = f1\_score(y\_true, y\_pred)

...: roc\_auc = roc\_auc\_score(y\_true, test\_scores)

...: pr\_auc = average\_precision\_score(y\_true, test\_scores)

...: mcc = matthews\_corrcoef(y\_true, y\_pred)

...:

...: # Confusion Matrix

...: conf\_matrix = confusion\_matrix(y\_true, y\_pred)

...:

...: # Display evaluation metrics

...: print("\nEvaluation Metrics:")

...: print(f'Precision: {precision:.4f}')

...: print(f'Recall: {recall:.4f}')

...: print(f'F1 Score: {f1:.4f}')

...: print(f'ROC AUC: {roc\_auc:.4f}')

...: print(f'PR AUC: {pr\_auc:.4f}')

...: print(f'MCC: {mcc:.4f}')

Evaluation Metrics:

Precision: 0.6713

Recall: 0.1572

F1 Score: 0.2547

ROC AUC: 0.5962

PR AUC: 0.5913

MCC: 0.1248

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, πολυχρωμία

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, γραμμή

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, οθόνη, διάγραμμα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, διάγραμμα, γράφημα, γραμμή

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Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, διάγραμμα, ορθογώνιο παραλληλόγραμμο

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, διάγραμμα, γράφημα, γραμμή

Περιγραφή που δημιουργήθηκε αυτόματα

Triplet 1 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/hlth\_ehis\_aw1u, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/term, Object: hlth\_ehis\_aw1u

157/157 [==============================] - 7s 44ms/step

Intercept 0.3047300561548365

Prediction\_local [0.57380248]

Right: 0.5700525

Feature Importances (Coefficients):

Predicate: 0.21134476960654572

Object: 0.04242101326594716

Subject: 0.015306643383883005

Triplet 2 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/fats\_08, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/level, Object: 4

157/157 [==============================] - 2s 12ms/step

Intercept 0.44927916990639283

Prediction\_local [0.48462907]

Right: 0.47498032

Feature Importances (Coefficients):

Predicate: 0.08270751014206756

Object: -0.07446529199220224

Subject: 0.027107683248557637

Triplet 3 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/ei\_qna, Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type, Object: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/StatisticalData

157/157 [==============================] - 2s 12ms/step

Intercept 0.36263932612974303

Prediction\_local [0.42086586]

Right: 0.060449276

Feature Importances (Coefficients):

Predicate: 0.2125551183595507

Subject: -0.07989001865686265

Object: -0.07443856114063567

Triplet 4 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/glossaryArticle118, Predicate: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/hasReference, Object: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/referenceSource59

157/157 [==============================] - 2s 12ms/step

Intercept 0.5106487659373478

Prediction\_local [0.16497108]

Right: 0.20496733

Feature Importances (Coefficients):

Predicate: -0.39656787862276516

Object: 0.0366660398882475

Subject: 0.014224157781535102

Triplet 5 (Original):

Subject: https://ec.europa.eu/eurostat/NLP4StatRef/knowledge/paragraph9574\_3455, Predicate: http://www.w3.org/1999/02/22-rdf-syntax-ns#type, Object: https://ec.europa.eu/eurostat/NLP4StatRef/ontology/Paragraph

157/157 [==============================] - 2s 12ms/step

Intercept 0.30330239039130125

Prediction\_local [0.55512571]

Right: 0.36820805

Feature Importances (Coefficients):

Predicate: 0.21514505285820112

Object: 0.020595218697635607

Subject: 0.016083046661834816