Epoch 1/20

1682/1682 [==============================] - ETA: 0s - loss: 24.6629 - accuracy: 0.53902024-05-24 14:32:55.905881: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 10509312000 exceeds 10% of free system memory.

2024-05-24 14:33:00.660318: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 10509312000 exceeds 10% of free system memory.

2024-05-24 14:33:05.141808: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 1847623680 exceeds 10% of free system memory.

2024-05-24 14:33:05.925551: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 2463498240 exceeds 10% of free system memory.

1682/1682 [==============================] - 1209s 716ms/step - loss: 24.6629 - accuracy: 0.5390 - val\_loss: 23.0840 - val\_accuracy: 0.5989 - lr: 1.0000e-05

Epoch 2/20

1682/1682 [==============================] - ETA: 0s - loss: 23.0488 - accuracy: 0.57802024-05-24 14:52:50.717949: W tensorflow/tsl/framework/cpu\_allocator\_impl.cc:83] Allocation of 10509312000 exceeds 10% of free system memory.

1682/1682 [==============================] - 1194s 710ms/step - loss: 23.0488 - accuracy: 0.5780 - val\_loss: 21.8224 - val\_accuracy: 0.6316 - lr: 1.0000e-05

Epoch 3/20

1682/1682 [==============================] - 1141s 679ms/step - loss: 21.7409 - accuracy: 0.6214 - val\_loss: 20.6204 - val\_accuracy: 0.7055 - lr: 1.0000e-05

Epoch 4/20

1682/1682 [==============================] - 1128s 671ms/step - loss: 20.5811 - accuracy: 0.6565 - val\_loss: 19.5209 - val\_accuracy: 0.7218 - lr: 1.0000e-05

Epoch 5/20

1682/1682 [==============================] - 1133s 674ms/step - loss: 19.2595 - accuracy: 0.6787 - val\_loss: 18.2299 - val\_accuracy: 0.7305 - lr: 1.0000e-05

Epoch 6/20

1682/1682 [==============================] - 1134s 674ms/step - loss: 18.0034 - accuracy: 0.6878 - val\_loss: 16.9673 - val\_accuracy: 0.7298 - lr: 1.0000e-05

Epoch 7/20

1682/1682 [==============================] - 1133s 673ms/step - loss: 16.6083 - accuracy: 0.6951 - val\_loss: 15.6661 - val\_accuracy: 0.7269 - lr: 1.0000e-05

Epoch 8/20

1682/1682 [==============================] - 1143s 679ms/step - loss: 15.2211 - accuracy: 0.7011 - val\_loss: 14.2278 - val\_accuracy: 0.7342 - lr: 1.0000e-05

Epoch 9/20

1682/1682 [==============================] - 1143s 679ms/step - loss: 13.7767 - accuracy: 0.7013 - val\_loss: 12.9042 - val\_accuracy: 0.7343 - lr: 1.0000e-05

Epoch 10/20

1682/1682 [==============================] - 1143s 679ms/step - loss: 12.5206 - accuracy: 0.7050 - val\_loss: 11.6670 - val\_accuracy: 0.7347 - lr: 1.0000e-05

Epoch 11/20

1682/1682 [==============================] - 1143s 680ms/step - loss: 11.2734 - accuracy: 0.7093 - val\_loss: 10.4950 - val\_accuracy: 0.7284 - lr: 1.0000e-05

Epoch 12/20

1682/1682 [==============================] - 1140s 678ms/step - loss: 10.1001 - accuracy: 0.7106 - val\_loss: 9.3959 - val\_accuracy: 0.7343 - lr: 1.0000e-05

Epoch 13/20

1682/1682 [==============================] - 1141s 678ms/step - loss: 9.0021 - accuracy: 0.7185 - val\_loss: 8.3831 - val\_accuracy: 0.7364 - lr: 1.0000e-05

Epoch 14/20

1682/1682 [==============================] - 1139s 677ms/step - loss: 8.0279 - accuracy: 0.7320 - val\_loss: 7.4675 - val\_accuracy: 0.7252 - lr: 1.0000e-05

Epoch 15/20

1682/1682 [==============================] - 1140s 678ms/step - loss: 7.0764 - accuracy: 0.7497 - val\_loss: 6.6262 - val\_accuracy: 0.7210 - lr: 1.0000e-05

Epoch 16/20

1682/1682 [==============================] - 1140s 678ms/step - loss: 6.2588 - accuracy: 0.7640 - val\_loss: 5.8576 - val\_accuracy: 0.7217 - lr: 1.0000e-05

Epoch 17/20

1682/1682 [==============================] - 1141s 678ms/step - loss: 5.4667 - accuracy: 0.7802 - val\_loss: 5.1403 - val\_accuracy: 0.7394 - lr: 1.0000e-05

Epoch 18/20

1682/1682 [==============================] - 1141s 678ms/step - loss: 4.7314 - accuracy: 0.7954 - val\_loss: 4.4769 - val\_accuracy: 0.7409 - lr: 1.0000e-05

Epoch 19/20

1682/1682 [==============================] - 1142s 679ms/step - loss: 4.0463 - accuracy: 0.8057 - val\_loss: 3.8623 - val\_accuracy: 0.7475 - lr: 1.0000e-05

Epoch 20/20

1682/1682 [==============================] - 1138s 677ms/step - loss: 3.4127 - accuracy: 0.8161 - val\_loss: 3.3240 - val\_accuracy: 0.7400 - lr: 1.0000e-05

2883/2883 [==============================] - 37s 13ms/step

Evaluation Metrics:

Precision: 0.7009

Recall: 0.8418

F1 Score: 0.7649

ROC AUC: 0.8224

PR AUC: 0.7732

MCC: 0.4926

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: 0.7344

Recall: 0.7337

F1 Score: 0.7340

ROC AUC: 0.8224

PR AUC: 0.7732

MCC: 0.4683

In [9]: 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: 0.7924

Recall: 0.5578

F1 Score: 0.6547

ROC AUC: 0.8224

PR AUC: 0.7732

MCC: 0.4311

Εικόνα που περιέχει γραμμή, γράφημα, κείμενο, διάγραμμα

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, στιγμιότυπο οθόνης, γραμματοσειρά, διάγραμμα

Περιγραφή που δημιουργήθηκε αυτόματα

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, διάγραμμα, γράφημα, γραμμή

Περιγραφή που δημιουργήθηκε αυτόματα

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

Περιγραφή που δημιουργήθηκε αυτόματα

Εικόνα που περιέχει κείμενο, διάγραμμα, γραμμή, γράφημα

Περιγραφή που δημιουργήθηκε αυτόματα

Triplet 1 (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 14ms/step

Intercept 0.3856402230367812

Prediction\_local [0.05751228]

Right: 0.018580155

Feature Importances (Coefficients):

Predicate: -0.14353195450041897

Subject: -0.10248130380261831

Object: -0.08211468728944502

Triplet 2 (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 14ms/step

Intercept 0.2569907888965951

Prediction\_local [0.48225345]

Right: 0.55813473

Feature Importances (Coefficients):

Subject: 0.37159497291503096

Predicate: -0.10405627880758604

Object: -0.04227603050833366

Triplet 3 (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 13ms/step

Intercept 0.33342671002401136

Prediction\_local [0.29315464]

Right: 0.3688475

Feature Importances (Coefficients):

Object: 0.22313005924947335

Predicate: -0.1458135898344492

Subject: -0.11758854139609677

Triplet 4 (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 14ms/step

Intercept 0.34942144769959854

Prediction\_local [0.07521246]

Right: 0.664456

Feature Importances (Coefficients):

Predicate: -0.11068368095290508

Subject: -0.10518996241715071

Object: -0.05833534592288311

Triplet 5 (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 [==============================] - 2s 13ms/step

Intercept 0.26680348441880475

Prediction\_local [0.45994403]

Right: 0.63872755

Feature Importances (Coefficients):

Predicate: 0.3810477825826674

Subject: -0.11773848234637631

Object: -0.07016875103334896