**Unigram**

**Without feature selection:**

Precision: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.2958057395143488, (0.1, 'سیاسی'): 0.6301369863013698, (0.1, 'ادب و هنر'): 0.2328767123287671, (0.1, 'اجتماعی'): 0.6304347826086957, (0.1, 'ورزش'): 0.3767441860465116, (0.3, 'اقتصاد'): 0.29777777777777775, (0.3, 'سیاسی'): 0.6388888888888888, (0.3, 'ادب و هنر'): 0.2537313432835821, (0.3, 'اجتماعی'): 0.58, (0.3, 'ورزش'): 0.3665158371040724, (0.5, 'اقتصاد'): 0.29977628635346754, (0.5, 'سیاسی'): 0.5974025974025974, (0.5, 'ادب و هنر'): 0.26153846153846155, (0.5, 'اجتماعی'): 0.5918367346938775, (0.5, 'ورزش'): 0.36486486486486486}

Recall: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.3383838383838384, (0.1, 'سیاسی'): 0.2541436464088398, (0.1, 'ادب و هنر'): 0.17525773195876287, (0.1, 'اجتماعی'): 0.19205298013245034, (0.1, 'ورزش'): 0.28825622775800713, (0.3, 'اقتصاد'): 0.34096692111959287, (0.3, 'سیاسی'): 0.25555555555555554, (0.3, 'ادب و هنر'): 0.18681318681318682, (0.3, 'اجتماعی'): 0.1870967741935484, (0.3, 'ورزش'): 0.28222996515679444, (0.5, 'اقتصاد'): 0.3435897435897436, (0.5, 'سیاسی'): 0.24864864864864866, (0.5, 'ادب و هنر'): 0.19101123595505617, (0.5, 'اجتماعی'): 0.18831168831168832, (0.5, 'ورزش'): 0.28125}

F-measure: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.31566548881036516, (0.1, 'سیاسی'): 0.36220472440944884, (0.1, 'ادب و هنر'): 0.19999999999999998, (0.1, 'اجتماعی'): 0.29441624365482233, (0.1, 'ورزش'): 0.3266129032258065, (0.3, 'اقتصاد'): 0.31791221826809013, (0.3, 'سیاسی'): 0.36507936507936506, (0.3, 'ادب و هنر'): 0.21518987341772153, (0.3, 'اجتماعی'): 0.28292682926829266, (0.3, 'ورزش'): 0.3188976377952756, (0.5, 'اقتصاد'): 0.3201911589008363, (0.5, 'سیاسی'): 0.35114503816793896, (0.5, 'ادب و هنر'): 0.2207792207792208, (0.5, 'اجتماعی'): 0.28571428571428575, (0.5, 'ورزش'): 0.3176470588235294}

Macro Average:

{(0.1, 'Macro\_precision'): 0.43319968135993864, (0.1, 'Macro\_recalls'): 0.24961888492837972, (0.1, 'Macro\_f\_measure'): 0.29977987202008854, (0.3, 'Macro\_precision'): 0.4273827694108642, (0.3, 'Macro\_recalls'): 0.25053248056773564, (0.3, 'Macro\_f\_measure'): 0.300001184765749, (0.5, 'Macro\_precision'): 0.4230837889706538, (0.5, 'Macro\_recalls'): 0.2505622633010273, (0.5, 'Macro\_f\_measure'): 0.29909535247716224}

Micro Average:

{(0.1, 'Micro\_precision'): 0.4541951181356884, (0.1, 'Micro\_recalls'): 0.26676712014509435, (0.1, 'micro\_f\_measure'): 0.31756273566522875, (0.3, 'Micro\_precision'): 0.44584990425472687, (0.3, 'Micro\_recalls'): 0.265971514595125, (0.3, 'micro\_f\_measure'): 0.3155838352520028, (0.5, 'Micro\_precision'): 0.439024562342585, (0.5, 'Micro\_recalls'): 0.2652623517527489, (0.5, 'micro\_f\_measure'): 0.3134761569186655})

**Unigram**

**With feature selection:**

Precision: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.38271604938271603, (0.1, 'سیاسی'): 0.6363636363636364, (0.1, 'ادب و هنر'): 0.21518987341772153, (0.1, 'اجتماعی'): 0.8857142857142857, (0.1, 'ورزش'): 0.32075471698113206, (0.3, 'اقتصاد'): 0.384297520661157, (0.3, 'سیاسی'): 0.631578947368421, (0.3, 'ادب و هنر'): 0.2236842105263158, (0.3, 'اجتماعی'): 0.8857142857142857, (0.3, 'ورزش'): 0.3181818181818182, (0.5, 'اقتصاد'): 0.38271604938271603, (0.5, 'سیاسی'): 0.631578947368421, (0.5, 'ادب و هنر'): 0.2236842105263158, (0.5, 'اجتماعی'): 0.8857142857142857, (0.5, 'ورزش'): 0.3163538873994638}

Recall: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.34701492537313433, (0.1, 'سیاسی'): 0.5121951219512195, (0.1, 'ادب و هنر'): 0.1650485436893204, (0.1, 'اجتماعی'): 0.22794117647058823, (0.1, 'ورزش'): 0.3296398891966759, (0.3, 'اقتصاد'): 0.34831460674157305, (0.3, 'سیاسی'): 0.509090909090909, (0.3, 'ادب و هنر'): 0.17, (0.3, 'اجتماعی'): 0.22794117647058823, (0.3, 'ورزش'): 0.3269230769230769, (0.5, 'اقتصاد'): 0.34701492537313433, (0.5, 'سیاسی'): 0.509090909090909, (0.5, 'ادب و هنر'): 0.17, (0.5, 'اجتماعی'): 0.22794117647058823, (0.5, 'ورزش'): 0.3232876712328767}

F-measure: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.36399217221135033, (0.1, 'سیاسی'): 0.5675675675675675, (0.1, 'ادب و هنر'): 0.18681318681318684, (0.1, 'اجتماعی'): 0.3625730994152046, (0.1, 'ورزش'): 0.32513661202185795, (0.3, 'اقتصاد'): 0.36542239685658157, (0.3, 'سیاسی'): 0.5637583892617449, (0.3, 'ادب و هنر'): 0.19318181818181818, (0.3, 'اجتماعی'): 0.3625730994152046, (0.3, 'ورزش'): 0.32249322493224936, (0.5, 'اقتصاد'): 0.36399217221135033, (0.5, 'سیاسی'): 0.5637583892617449, (0.5, 'ادب و هنر'): 0.19318181818181818, (0.5, 'اجتماعی'): 0.3625730994152046, (0.5, 'ورزش'): 0.3197831978319783}

Macro Average:

{(0.1, 'Macro\_precision'): 0.48814771237189836, (0.1, 'Macro\_recalls'): 0.3163679313361877, (0.1, 'Macro\_f\_measure'): 0.36121652760583345, (0.3, 'Macro\_precision'): 0.4886913564903995, (0.3, 'Macro\_recalls'): 0.31645395384522945, (0.3, 'Macro\_f\_measure'): 0.3614857857295197, (0.5, 'Macro\_precision'): 0.4880094760782404, (0.5, 'Macro\_recalls'): 0.31546693643350165, (0.5, 'Macro\_f\_measure'): 0.36065773538041923}

Micro Average:

{(0.1, 'Micro\_precision'): 0.5093143376672499, (0.1, 'Micro\_recalls'): 0.34598173916221375, (0.1, 'micro\_f\_measure'): 0.3888158016638782, (0.3, 'Micro\_precision'): 0.5084803879774393, (0.3, 'Micro\_recalls'): 0.345192368771885, (0.3, 'micro\_f\_measure'): 0.38800955759635386, (0.5, 'Micro\_precision'): 0.5076077616307789, (0.5, 'Micro\_recalls'): 0.34390968822990103, (0.5, 'micro\_f\_measure'): 0.3869401813416962})

**Bigram**

Precision: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.3510204081632653, (0.1, 'سیاسی'): 0.3581081081081081, (0.1, 'ادب و هنر'): 0.1188118811881188, (0.1, 'اجتماعی'): 0.2578616352201258, (0.1, 'ورزش'): 0.34299516908212563, (0.3, 'اقتصاد'): 0.37142857142857144, (0.3, 'سیاسی'): 0.325, (0.3, 'ادب و هنر'): 0.11009174311926606, (0.3, 'اجتماعی'): 0.1945945945945946, (0.3, 'ورزش'): 0.37755102040816324, (0.5, 'اقتصاد'): 0.3588516746411483, (0.5, 'سیاسی'): 0.26143790849673204, (0.5, 'ادب و هنر'): 0.10091743119266056, (0.5, 'اجتماعی'): 0.19801980198019803, (0.5, 'ورزش'): 0.36363636363636365}

Recall: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.3028169014084507, (0.1, 'سیاسی'): 0.2190082644628099, (0.1, 'ادب و هنر'): 0.08888888888888889, (0.1, 'اجتماعی'): 0.17083333333333334, (0.1, 'ورزش'): 0.24232081911262798, (0.3, 'اقتصاد'): 0.2943396226415094, (0.3, 'سیاسی'): 0.203125, (0.3, 'ادب و هنر'): 0.08391608391608392, (0.3, 'اجتماعی'): 0.13043478260869565, (0.3, 'ورزش'): 0.26811594202898553, (0.5, 'اقتصاد'): 0.2777777777777778, (0.5, 'سیاسی'): 0.14652014652014653, (0.5, 'ادب و هنر'): 0.07586206896551724, (0.5, 'اجتماعی'): 0.14035087719298245, (0.5, 'ورزش'): 0.24372759856630824}

F-measure: (از سمت راست خوانده شود)

{(0.1, 'اقتصاد'): 0.3251417769376181, (0.1, 'سیاسی'): 0.2717948717948718, (0.1, 'ادب و هنر'): 0.10169491525423728, (0.1, 'اجتماعی'): 0.2055137844611529, (0.1, 'ورزش'): 0.284, (0.3, 'اقتصاد'): 0.328421052631579, (0.3, 'سیاسی'): 0.25000000000000006, (0.3, 'ادب و هنر'): 0.09523809523809525, (0.3, 'اجتماعی'): 0.15618221258134488, (0.3, 'ورزش'): 0.31355932203389836, (0.5, 'اقتصاد'): 0.31315240083507306, (0.5, 'سیاسی'): 0.18779342723004697, (0.5, 'ادب و هنر'): 0.08661417322834647, (0.5, 'اجتماعی'): 0.16427104722792607, (0.5, 'ورزش'): 0.2918454935622318}

Macro Average:

{(0.1, 'Macro\_precision'): 0.28575944035234874, (0.1, 'Macro\_recalls'): 0.20477364144122218, (0.1, 'Macro\_f\_measure'): 0.23762906968957598, (0.3, 'Macro\_precision'): 0.2757331859101191, (0.3, 'Macro\_recalls'): 0.1959862862390549, (0.3, 'Macro\_f\_measure'): 0.22868013649698354, (0.5, 'Macro\_precision'): 0.2565726359894205, (0.5, 'Macro\_recalls'): 0.17684769380454646, (0.5, 'Macro\_f\_measure'): 0.20873530841672486}

Micro Average:

{(0.1, 'Micro\_precision'): 0.3172236766797519, (0.1, 'Micro\_recalls'): 0.2278448310887362, (0.1, 'micro\_f\_measure'): 0.26408481540084355, (0.3, 'Micro\_precision'): 0.31111314098177456, (0.3, 'Micro\_recalls'): 0.22091755533990398, (0.3, 'micro\_f\_measure'): 0.2578719508180939, (0.5, 'Micro\_precision'): 0.28958699382519326, (0.5, 'Micro\_recalls'): 0.19856072775664516, (0.5, 'micro\_f\_measure'): 0.23485397360441246})