**Result in Tables:**

| | %Labels Nodes | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% |
|---|---|---|---|---|---|---|---|---|---|---|
| Micro-F1-Dimension-7 | Deepwalk | 0.155045113 | 0.174793392 | 0.182841549 | 0.188002873 | 0.191046244 | 0.191954315 | 0.197245094 | 0.198440404 | 0.193461143 |
| | Node2vec | 0.157898054 | 0.172057703 | 0.180194482 | 0.185396691 | 0.186733388 | 0.188305412 | 0.190086821 | 0.191250959 | 0.193760958 |
| | Line | 0.064673038 | 0.064157575 | 0.064943135 | 0.065208981 | 0.064036465 | 0.064822211 | 0.062569015 | 0.062603317 | 0.064665152 |
| | Centrality | 0.082350114 | 0.087461574 | 0.092252093 | 0.093306689 | 0.093717691 | 0.094292839 | 0.096589355 | 0.097163259 | 0.093129689 |
| Macro-F1-Dimension-7 | Deepwalk | 0.092560516 | 0.107043832 | 0.112462224 | 0.116599483 | 0.118980586 | 0.118970178 | 0.122867535 | 0.124069889 | 0.117349335 |
| | Node2vec | 0.091954034 | 0.106426738 | 0.113234178 | 0.117319989 | 0.117330231 | 0.118006429 | 0.119209774 | 0.120046011 | 0.122983429 |
| | Line | 0.034614972 | 0.035604266 | 0.035573226 | 0.035272162 | 0.035643342 | 0.036135945 | 0.035755167 | 0.034239042 | 0.034587639 |
| | Centrality | 0.026560944 | 0.031527216 | 0.03257836 | 0.034160638 | 0.035251433 | 0.035496123 | 0.038098604 | 0.03794786 | 0.034902747 |
| | | | | | | | | | | |

From the top table we see for both micro and macro dimension 7 DeepWalk performs very good. Similarly, node2vec achieves almost similar trend to DeepWalk. However, both line and centrality doesn't perform decent.

We also see, for micro f1 score label nodes from 20%-80% DeepWalk performs best. Yet, Node2vec performs best when training data is minimum (10%) and maximum (90%).

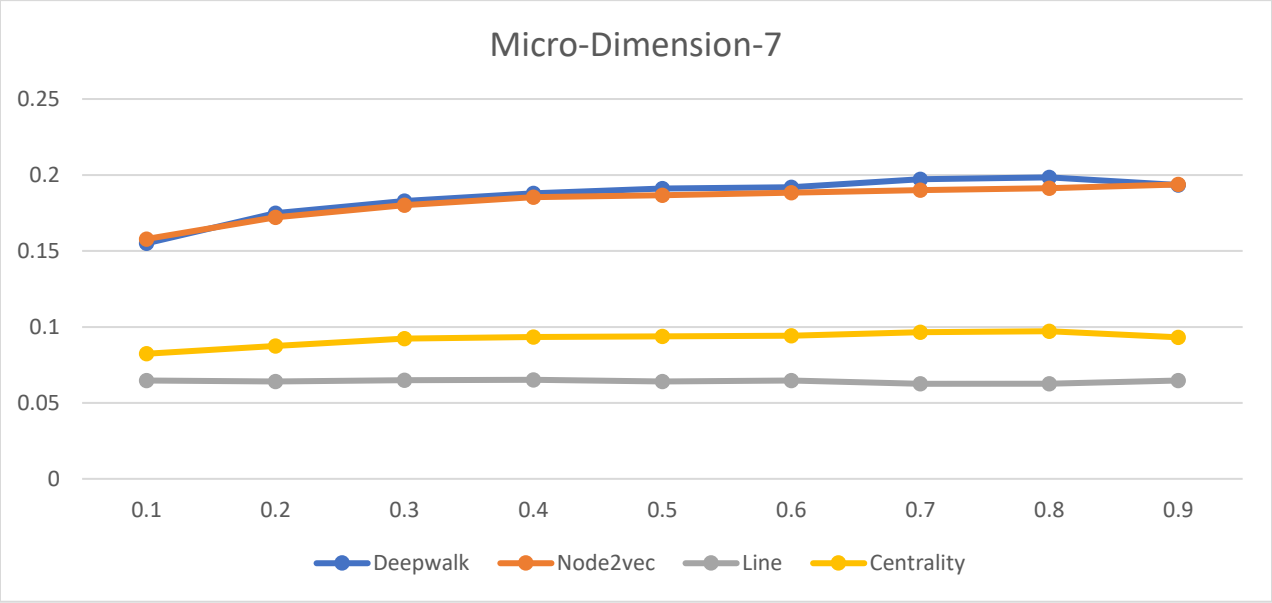
For the Macro f1 scenario is little bit different. DeepWalk performs good in first four sector and last sector while node2vec performs good the rest of the sector.

Overall Micro score for dimension 7 is greater than in every column compare to macro score of dimensions 7.

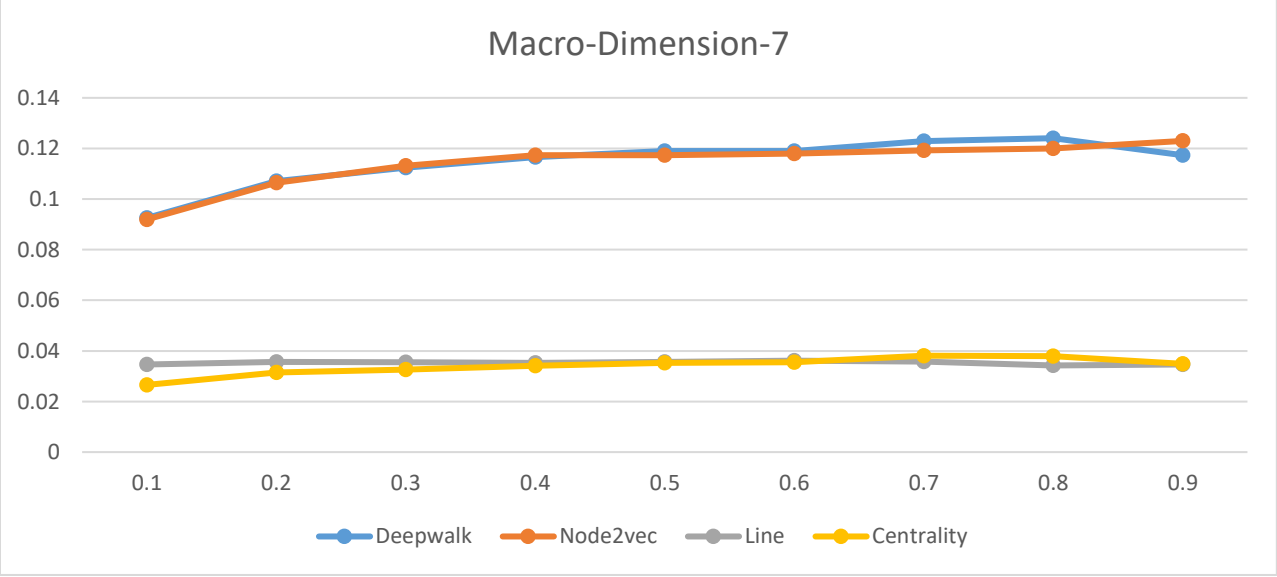
| | %Labels Nodes | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% |
|---|---|---|---|---|---|---|---|---|---|---|
| Micro-F1-Dimension-128 | Deepwalk | 0.160943301 | 0.185161865 | 0.197638141 | 0.205578187 | 0.214691224 | 0.221786151 | 0.22813834 | 0.230173275 | 0.240791605 |
| | Node2vec | 0.173026963 | 0.19142352 | 0.204887145 | 0.21076138 | 0.217127072 | 0.220036267 | 0.223844886 | 0.225767933 | 0.218849395 |
| | Line | 0.065707633 | 0.065173816 | 0.066703033 | 0.065300763 | 0.065259838 | 0.064328327 | 0.065769648 | 0.064318378 | 0.06844765 |
| Macro-F1-Dimension-128 | Deepwalk | 0.131291333 | 0.159074952 | 0.171143973 | 0.179434317 | 0.186917467 | 0.190231969 | 0.19617627 | 0.196985864 | 0.202725611 |
| | Node2vec | 0.140382107 | 0.159972112 | 0.174235035 | 0.17975048 | 0.185536675 | 0.188702991 | 0.19152269 | 0.188962099 | 0.17924155 |
| | Line | 0.037117342 | 0.038996048 | 0.04044672 | 0.039636096 | 0.039699405 | 0.039455778 | 0.039813526 | 0.039782126 | 0.041394013 |

For the dimension 128 in macro DeepWalk performs better than other. Yet, for micro Node2vec performs better than DeepWalk. In here also overall micro values is greater than macro values.

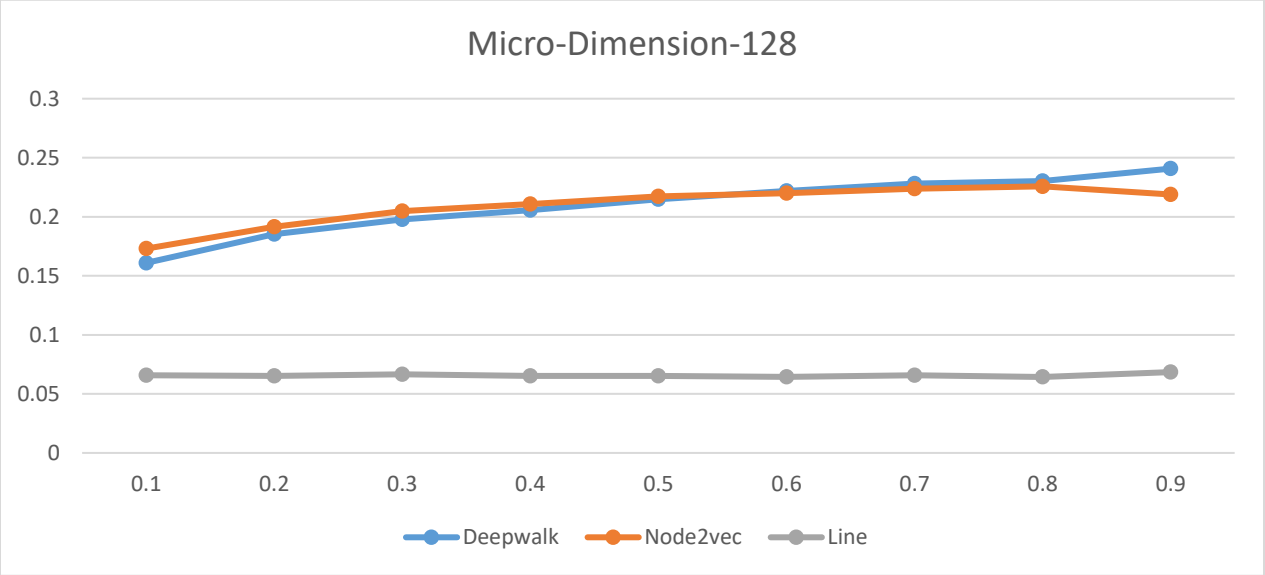
**Graphs Analysis:**



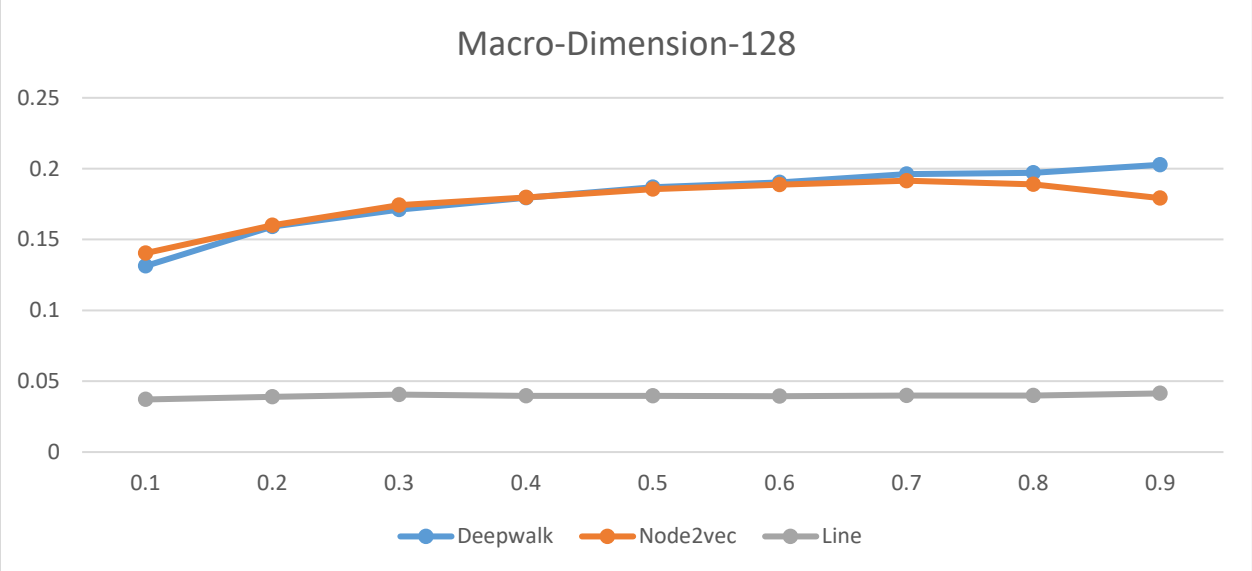

In the figure we can see DeepWalk and Node2vec almost similarly performs and produce best outputs. While line produce lowest ouput which is around one third of Node2vec and DeepWalk. Centrality performs little bit better than line but worse than both Node2vec and DeepWalk.



In macro dimension 7 DeepWalk and Node2vec are neck and neck to produce best outputs while line and centrality both are same trend but produce worst outputs.




For the dimension 128 Micro DeepWalk and Node2vec performs almost similar while DeepWalk is slightly better. Line performs very poor here.



For the Macro dimension 128 trend is like micro dimension 128. However, the overall value in macro is little bit lower comparing to the micro values.

In the Line paper they mention line performs best when the network is so large. In our project dataset is not so large. Maybe that's a reason why line performs so poor everywhere in this macro and micro f1 scores. Meanwhile for our dataset overall DeepWalk and Node2vec performs very well.

**How to Run Source Code:**

I use DeepWalk scoring.py file to generate F1 micro and Macro scores. I included commands.txt file in my project folder where all the commands are written there how I run the scoring.py file and get the outputs.