# Laboratory 2

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[ Number of edges: 88234 3](#_Toc489900968)

[ Average degree: 43.6910 3](#_Toc489900969)

[ Number of nodes: 4039 3](#_Toc489900970)

[ Number of edges: 88234 3](#_Toc489900971)

[ Average degree: 43.6910 3](#_Toc489900972)

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## **Git hub:** <https://github.com/sajevk/Computational-Social-Network-Analysis>

# Edge Cut Count

Count the number of edges cut by the partition. For this directed network of Amazon was used to evaluate the number of edges cut by the partition.

The Facebook combined data set from SNAP site was downloaded to evaluate the Edge cut count.

Please find the result below. The detection of the communities was

## Number of nodes: 4039

## Number of edges: 88234

## Average degree: 43.6910

## Number of nodes: 4039

## Number of edges: 88234

## Average degree: 43.6910

## Max node degree: 1045

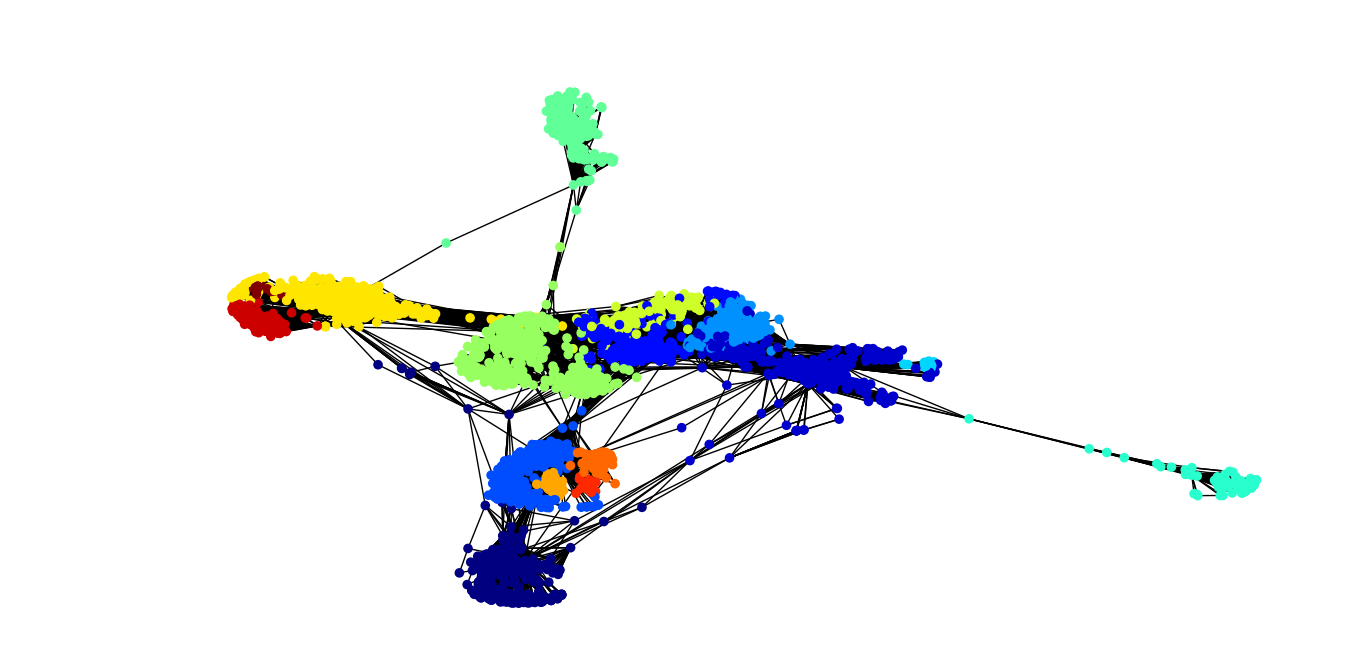
## Min node degree: 1

## Ave node degree: 43

Community algorithm

Lovain has been used in order to analyse the Facebook community graph. The community was detected. The below diagram depicts the detected communities. Distinct colour code was applied in-order to distinguish the various communities in the network graph. The lovain community algorithm was modified for this case study purpose.

(Run lovain.py)



# Louvain Community Quality Algorithm

## New Man’s Modularity and Partition – modifying Louvain algorithm

The Newman’s modularity and Partitions is calculated through the Louvain’s algorithm for the Facebook graph. The results is presented below:

## Louvain Modularity: 0.83497475803

**Louvain Partition:**  {0: 0, 1: 0, 2: 0, 3: 0, 4: 0, 5: 0, 6: 0, 7: 0, 8: 0, 9: 0, 10: 0, 11: 0, 12: 0, 13: 0, 14: 0, 15: 0, 16: 0, 17: 0, 18: 0, 19: 0, 20: 0, 21: 0, 22: 0, 23: 0, 24: 0, 25: 0, 26: 0, 27: 0, 28: 0, 29: 0, 30: 0, 31: 0, 32: 0, 33: 0, 34: 1, 35: 0, 36: 0, 37: 0, 38: 0, 39: 0, 40: 0, 41: 0, 42: 0, 43: 0, 44: 0, 45: 0, 46: 0, 47: 0, 48: 0, 49: 0, 50: 0, 51: 0, 52: 0, 53: 0, 54: 0, 55: 0, 56: 0, 57: 0, 58: 0, 59: 0, 60: 0, 61: 0, 62: 0, 63: 0, 64: 0, 65: 0, 66: 0, 67: 0, 68: 0, 69: 0, 70: 0, 71: 0, 72: 0, 73: 0, 74: 0, 75: 0, 76: 0, 77: 0, 78: 0, 79: 0, 80: 0, 81: 0, 82: 0, 83: 0, 84: 0, 85: 0, 86: 0, 87: 0, 88: 0, 89: 0, 90: 0, 91: 0, 92: 0, 93: 0, 94: 0, 95: 0, 96: 0, 97: 0, 98: 0, 99: 0, 100: 0, 101: 0, 102: 0, 103: 0, 104: 0, 105: 0, 106: 0, 107: 2, 108: 0, 109: 0, 110: 0, 111: 0, 112: 0, 113: 0, 114: 0, 115: 0, 116: 0, 117: 0, 118: 0, 119: 0, 120: 0, 121: 0, 122: 0, 123: 0, 124: 0, 125: 0, 126: 0, 127: 0, 128: 0, 129: 0, 130: 0, 131: 0, 132: 0, 133: 0, 134: 0, 135: 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# NetworkX Community Quality Algorithm

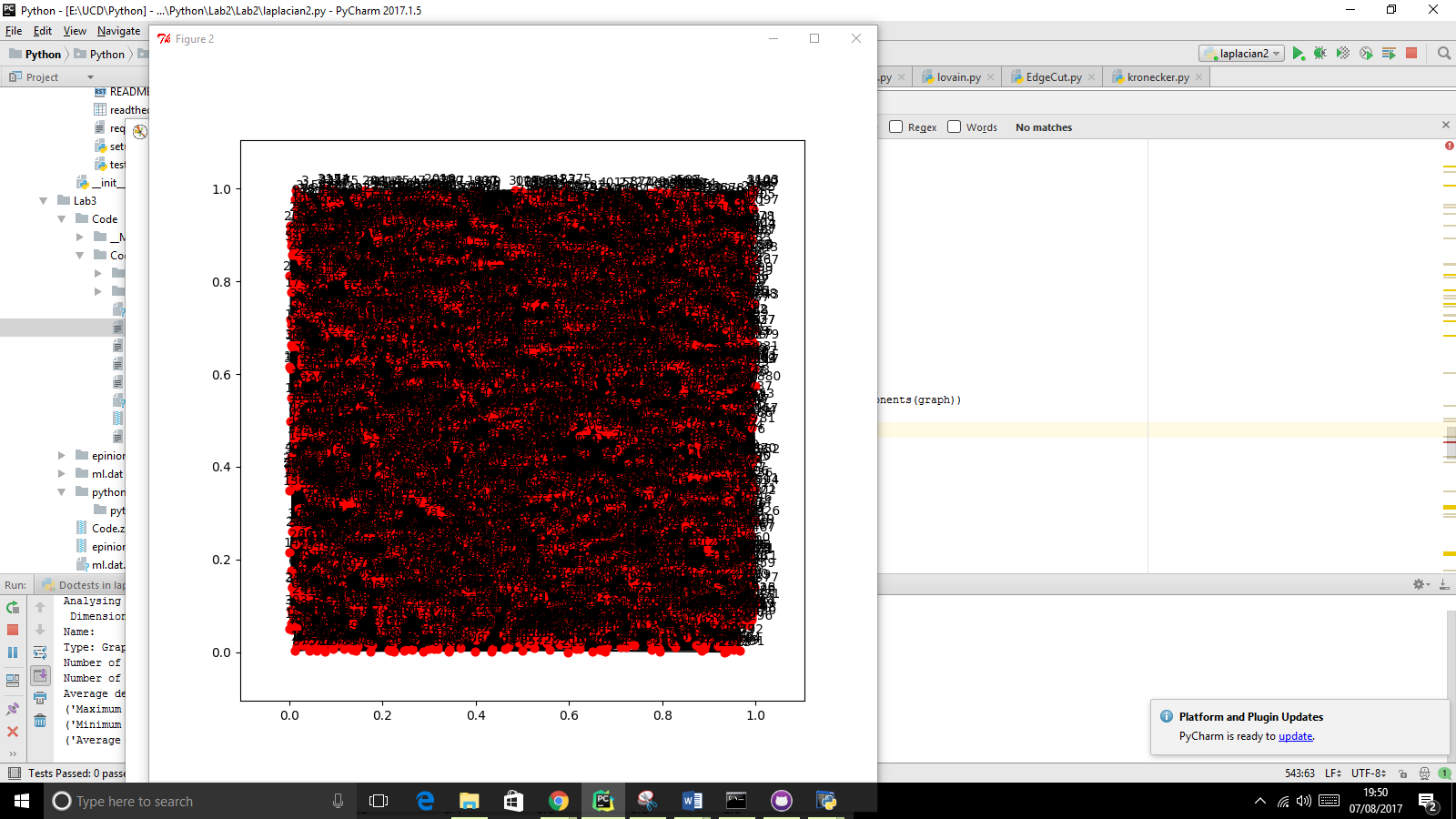
## **Reference**:

The source code to evaluate the community quality for networkx is based on the examples provided at the below URL:

<https://networkx.readthedocs.io/en/latest/_modules/networkx/algorithms/community/quality.html>

## Graph

The Random Graph for Random positions generated for Facebook:



## Number of nodes: 4039

## Number of edges: 88234

## Average degree: 43.6910

## ('Maximum Degree Node ', 1045)

## ('Minimum Degree Node ', 1)

## ('Average Degree Node ', 43)

## ('List of Partitions Detected: ', 15)

## Count community 0 is 554.

## Count community 1 is 548.

## Count community 2 is 60.

## Count community 3 is 25.

## Count community 4 is 432.

## Count community 5 is 237.

## Count community 6 is 353.

## Count community 7 is 423.

## Count community 8 is 226.

## Count community 9 is 73.

## Count community 10 is 19.

## Count community 11 is 440.

## Count community 12 is 323.

## Count community 13 is 120.

## Count community 14 is 206.

## Community Edges:

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## Edge cuts 3413

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