Network Science

Lab #3
Assortativity

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Timetable

- ❑ **Lab 1 – Fri Oct 12**
  Scale free properties
- ❑ **Lab 2 – Fri Oct 19**
  Albert-Baràbasi model
- ❑ **Lab 3 – Fri Oct 26**
  Assortativity
- ❑ **Lab 4 – Fri Nov 16**
  Ranking
- ❑ **Lab 5 – Fri Nov 23**
  Community detection – Spectral
- ❑ **Lab 6 – Fri Nov 30**
  Community detection – PageRank-Nibble
- ❑ **Lab 7 – Fri Dec 7**
  Gephi

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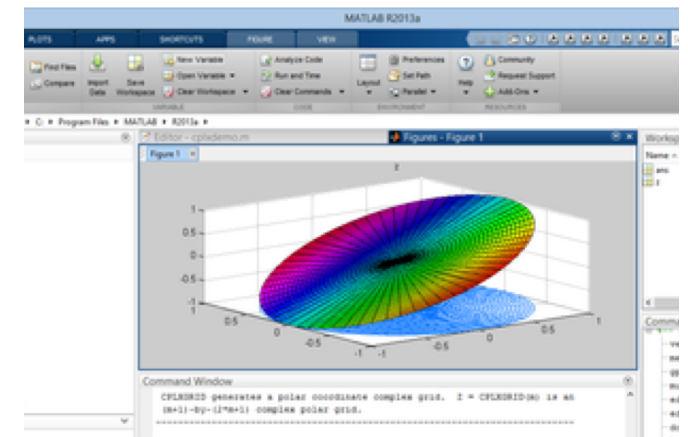
MATLAB Licence

MATLAB = MATrix LABoratory by MathWorks

"is a numerical computer environment which allows matrix manipulations, plotting of functions and data, implementation of algorithms" [wiki]
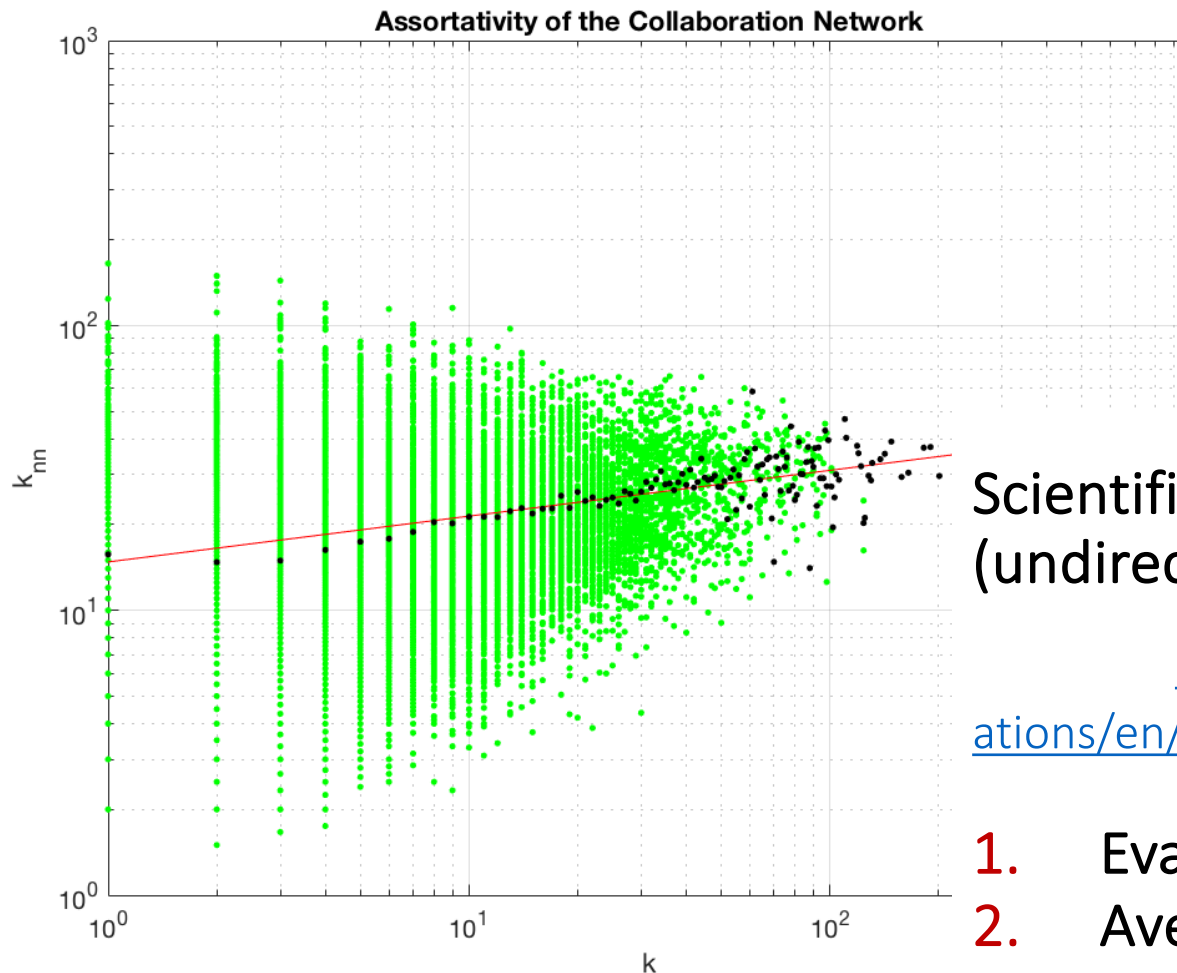
Total Academic Headcount
Campus & Student

You can freely install MATLAB in your laptop.

https://www.csia.unipd.it/servizi/servizi-utenti-istituzionali/contratti-software-e-licenze/matlab

MIME.

Lab 3 – Assortativity
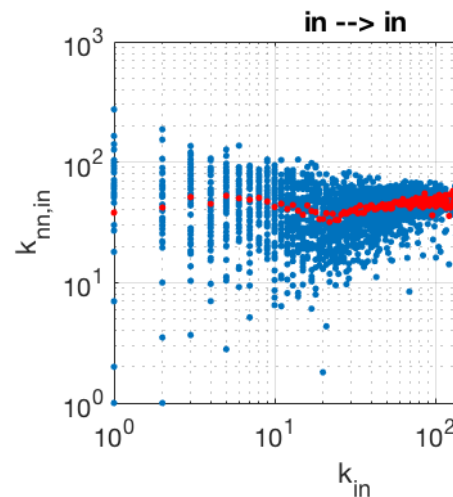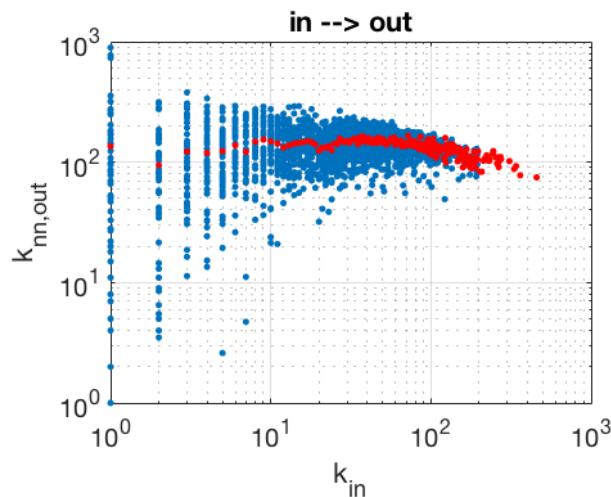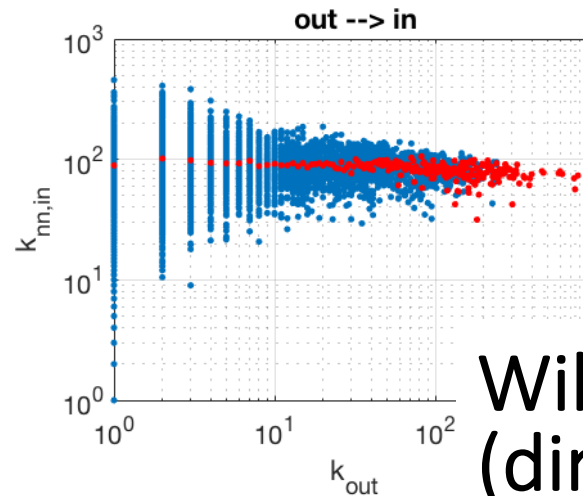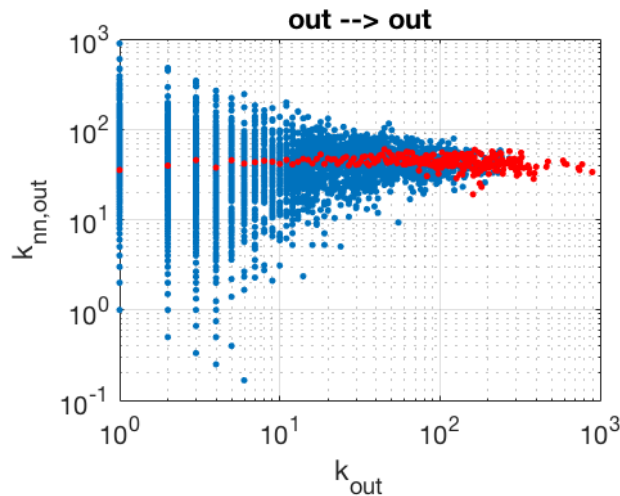
Assortativity of the Collaboration Network

ASSIGNMENT a

Scientific collaboration network (undirected, assortative)

http://networksciencebook.com/translations/en/resources/data.html

1. Evaluate average neigh. deg. k_{nn}
2. Average w.r.t. k
3. Extract the assortativity value
4. Graphically illustrate the result

МiME.

Lab 3 – Assortativity

out --> out

out --> in

in --> out

in --> in

ASSIGNMENT b

Wikipedia voting dataset
(directed, neutral)

https://snap.stanford.edu/data/wiki-Vote.html

1. Analise assortativity where averages are taken w.r.t. in/out degrees for in/out neighbours

MiME.

Lab 3 – Further MatLab hints

1. polyfit: does polynomial/linear fitting
   polyfit([0 1],[2 3],2) = [1, 2]
   i.e., the polynomial is p(x) = 1 · x + 2

2. you can easily calculate averages by exploiting matrix multiplication (by A or A'); computational complexity is low provided that A is sparse

MiME.