



Assignment #3

Issue Date: November 12, 2015,

Due Date: November 20 2015, 2300 hr.

Submission Mode: Electronic (via email) – all submission must reach at mqpasta.faculty@gmail.com before 20 November, 2015 2300 hr.

- You are provided “sina-holmekim.r” file which is R code for Holme & Kim model discussed in class. The file is available in course content folder (<http://tinyurl.com/sina-material>)
- Deliverable:
 - I. R Code
 - II. Word Document consisting your results/graphs/answers
- **Subject of Email:** <Reg #> Your Name – Assignment 3
e.g. 51209 Ahmed Ali - Assignment 3

Variant of BA Models

We have learned the Barabasi-Albert (BA) model and number of variation of this seminal model. The one another interesting model, also variant of BA, is Holme & Kim model which introduced triad formation step in original BA model.

Can you come up with dynamic/process which can help to extend BA model? Your proposed dynamics must have some rational from real-life or other.

You are provided the code of Holme & Kim model in R. You have to perform following tasks:

1. Modify given code in order to implement your proposed dynamics
2. Add code for
 - a. Print average number of nodes of all graphs
 - b. Print average number of edges of all graphs
 - c. Print average density of all graphs
 - d. Plot degree distribution of all graphs (degree distribution of each graph must represent by a different color)
 - e. Print bar chat for all values of CC/APL/Alpha (see `barplot()` of R)
3. Generate graph of equal density of any real-world network by using Holme & Kim and your proposed model. Compare characteristics of synthetic networks with real-world networks. Write a paragraph to discuss this.

