Lehrstuhl Informatik 5 (Information Systems)
Prof. Dr. M. Jarke, PD. Dr. R. Klamma, I. Koren

May 18, 2018

# Social Computing (SS 2018)

# Exercise 3

**Hand in until May 28, 2018, 14:15 via the L$^2$P-learning room**

Please hand in a single PDF file including solutions for all tasks. Group submissions of 2-3 students are allowed. Please do not hand in alone. The sample solution will be discussed in the exercise class.

**Task 3.1 (Social Bots)** (12 Points)

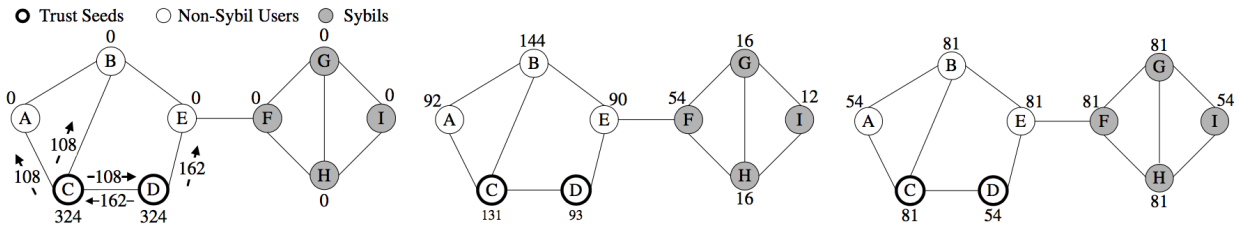
In the previous tasks, you created RESTful APIs for various use cases. Now, let us turn to client-side usage of RESTful APIs. Specifically, create a social Instagram bot that does the following things:

- It follows every account that posts something with the hashtag #SocialComputing in it.
- It saves all posts that contain the above hashtag *and* were posted at the RWTH Aachen University (location ID 234451301) in a database.

To simplify things, poll the REST API every 10 minutes. The API documentation for tags is available at `https://www.instagram.com/developer/endpoints/tags` and for locations at `https://www.instagram.com/developer/endpoints/locations/`. Write the pseudo-code/algorithm for the follow and save actions, but list the real Instagram API URLs and JSON object paths. You can use a `login()` function that returns the access token. We are aware, that the Instagram REST API is deprecated; use it nevertheless. We are talking about standard Instagram posts, not stories as in the last exercise.

**Task 3.2 (Sybil Attacks and SybilRank)** (13 Points)

Consider the figure below for an example of applying SybilRank to a network of both Sybil and Non-Sybil users. Additionally, so called "Trust Seeds" (Users of which is known they can be trusted) are given. Please answer the following questions:




Source: Cao, Qiang, et al. "Aiding the detection of fake accounts in large scale social online services" 2012

a) Shortly describe the idea of a Sybil Attack and the possible intentions for it.

b) How does SybilRank detect sybils in an OSN? Explain the basic principle. Explain what an attack edge is.

c) As one can see, after four power iterations the difference between Sybil and Non-Sybil users is clearly visible, whilst Figure c shows the distribution after about 50 iterations. Why does SybilRank only work on short random walks?