

# Economics of Information Networks

## Homework 4

Due November 15, 2018 at 11:00am

### Requirements

Submit your homework *by email to*

"Economics of Information Networks" <turnbull@sk.tsukuba.ac.jp>

The **Subject:** should be 01CN901 Homework #4 (in hankaku romaji). Use this class number, even if you are registered according to a different code. Your email must contain your *name* and *student ID number*.

### Problems

Suppose that each user  $i$  has a random value of being connected to each other user  $j$ ,  $u_i(j)$ , and the values are independently and identically distributed. Suppose that users are added to the network in a random sequence.

1. Does Metcalfe's law hold?
2. If so, prove it ...
3. ... and suggest generalizations where it still holds.
4. If not, give a counterexample ...
5. ... and suggest restrictions that might make it hold.