Project 4 – Epidemic broadcast

Consider a 2D floorplan with N users randomly dropped in it. A random user within the floorplan produces a *message*, which should ideally reach all the users as soon as possible. Communications are *slotted*, meaning that on each slot a user may or may not relay the message, and a message occupies an entire slot. A *broadcast radius R* is defined, so that only the users located within a radius R from the transmitter will receive the message, and no other user will hear it. A user that receives more than one message *in the same slot* will not be able to decode it (i.e., a collision occurs).

Users relay the message they receive *once*, according to the following policy (*trickle relaying*): after the user successfully receives a message, it waits for a time window of W slots. The message is relayed if the user receives less than M copies during that time window W, otherwise it stops. A sender does not need to know (or cares about) whether its message has been received by its neighbors or not.

Measure at least the time needed to broadcast a message over the entire floorplan, the percentage of covered users, and the number of collisions, at least for various values of N, M and W.

In all cases, it is up to the team to calibrate the scenarios so that meaningful results are obtained.

Project deliverables:
   a) Documentation (according to the standards set during the lectures and up to 10 pages)
   b) Simulator code
   c) Presentation (up to 10 slides)