Programming Homework 4
Due by 04/20/2020. Firm deadline!!!

- ## Creating a Gnutella network
  - A node joins the network with a PING to announce self
    - IP address, port, number/size of shared files
  - Receivers
    - forward the Ping to their neighbors
    - back-propagate a PONG to announce self, including sender's IP address
- ## Maintaining a Gnutella network (50 points)
  - PING neighbors periodically and PONG back
  - Choose a new neighbor when an existing one disappears
- ## Providing search capability (40 points)
  - Creates a query (A, S, N, T), where A is the requesting node, S search string, N unique request ID, T Time-to-Live and broadcast to all neighbors (30 points)
  - Download the file from a node which has the requested files. (10 points)
- ## Documents (10 points)

What to submit

- Design documents
  - Communication protocols (e.g., packet definition)
    - Please read the attached "Gnutella protocols" for your reference. You don't have to implement exactly. It is up to you to design any simplified version, but the system must be able to ping and pong.
    - You can implement your own protocol (which should be simpler!), but please document in a way that other people can implement their own gnutella node and join your system
  - Module designs and their pseudocode
- Source code
  - Java preferred, which allow us to run and test your code
  - If you use C/C++ or other languages, you will be asked to do the demo
- Submit through your canvas account