CS 348: Computer Networks
Programming Assignment

The **objective** of this assignment is to develop a peer-to-peer file transfer application, comprising one *manager* and multiple *peers*.

1. *Manager*

(i) A manager is an always-ON server, which maintains the list of currently active peers across the network at all times [1 mark].

(ii) A newly arrived peer connects to the manager

a) [1 mark] The manager adds this newly arrived peer to its list of active peers, and,
b) [1 mark] broadcasts the updated list.

(iii) The manager periodically:

a) [1 mark] checks availability of active peers from its list,
b) [1 mark] updates the same, if some peer(s) leave(s) the network, and,
c) [1 mark] broadcasts the updated list.

(iv) A peer informs the manager when it leaves the network

a) [1 mark] The manager deletes this peer from its list of active peers, and,
b) [1 mark] broadcasts the updated list.

2. *Peer*

(i) A new peer is expected to know the manager's IP and port. It pings the manager [1 mark], and saves the list of active peers sent by the manager [1 mark].

(ii) It also maintains a list of shareable files [1 mark].

(iii) Before going offline, a peer informs the manager [1 mark].

(iv)To fetching a file from other peer(s), a peer:

a) [1 mark] broadcasts its requirement to all peers (from its list of active peers)
b) [2 marks] based on received responses, parallely fetches different fragments of the required file from available peers
c) [2 marks] if any of the transmitting peers go offline, the requesting peer fetches its missing fragments from the remaining available peers

(v) On being requested to share a file by another peer, a peer:

a) [1 mark] informs the requesting peer of its availability
b) [1 mark] transmits the requested fragment(s)[1] of one of its shareable files

Submission Instructions

Submit a single zip file (named after your roll number) containing

- two python programs:
  - `roll_no_manager.py` (contains the manager program), and,

[1] A peer *parallely* fetches different fragments of the same file from multiple peers, and merges them.

    - `roll_no_peer.py` (contains the client's program)

  where, `roll_no` is your IIT Dharwad roll number.
- README file to state any explain your code files, program structure, demo instructions, etc.
    - Also record a demo of your code, and share its link in the README file.