# COMP9331 Assignment

## CDHT Report

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### 1. Language:

——— **Python 3.6**

### 2. Program Design:

There are 7 major functions: initialization(), udpHandler(), tcpHandler(), fileLocation(), quitHandler(), ungracefulQuit(), mainFunction().

**initialization()**: This function initializes the peer information, and sets UDP and TCP server sockets.

**udpHandler()**: This function handles the ping requests and responses from peers for their successors through UDP.

**tcpHandler()**: This function handles the file requests from peers by verifying and forwarding to find the correct node that has the requested file. Also, this function updates the successors of one's predecessors after ''quit'' by sending departure message through TCP.

**fileLocation()**: This function finds the location of requested file. Before locating, the filename applies a hash function to obtain a hash for further searching.

**quitHandler()**: This function handles 'quit' request denoting peer departure and updates relative predecessors & successors.

**ungracefulQuit()**: This function handles the peer departure that is ungraceful (shutdown) by noticing the killed peer after timeout and updating relative predecessors & successors.

**mainFuntion()**: This is the main function listening the requests and setting the ping time as well as timeouts. The system sends pings every 1 second, and the timeouts is 4 seconds.

## 3. Message Formats:

The message design in python3.6 is a simple but troublesome work. Because the sockets can only listen and send message in bytes, 'encode()' / 'decode()' must be necessarily added in relative statements, so that the strings can be encoded as bytes, and vice versa.

## 4. Design Tradeoffs:

The main design tradeoff considered was to make ping messages run every 1 second which makes the command line interface practical, and the reasonable timeout I felt was 4 seconds for an efficient death detection.

## 5. Possible Improvements:

Combining both TCP and UDP servers into one thread will be a better method. This would decrease the burden on the process, since it will need to handle less loop. The system, thus, can work efficiently.

## 6. Demo Address:

https://youtu.be/3GaTjsDPo8Y