

# Computer Network HW1 Report

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## Program Structure

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- There are some different modes:
  - In `general` mode, the command `!song`, `!chat`, `!guess`, and all constellation queries (`Libra` etc.) can be used.
    - `!song` use web crawler to process the query and the mode will not be changed.
    - `!guess` will change the mode into guessing mode.
    - `!chat` will change the mode into chatting mode.
  - In `guessing` mode, only the command related to guessing number can be used, in other words, the bot only process the string that can be cast into an integer. The other commands will be ignored.
    - After the guessing game is finished, the mode will be changed into `general` mode.
  - In `chatting` mode, only the command `!bye` will be viewed as a special command. All other contents will only be viewed as about chatting and will not invoke any function.
    - After the command `!bye`, the mode will be changed into `general` mode.

## Challenge & Solution

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- "The bot should be able to chat with multiple users simultaneously," said TA.
  - Though the function won't be tested when demo.
  - Due to the ambiguity in the specification document, I think the function can't be implemented in chatting mode. (Since the bot has only a screen)
  - Solution: Use a dict to store the state of different user.
- In chatting mode, the bot should be able to send message to and receive the message from TA.
  - The program should be able to wait input from user and print out message simultaneously.
  - Solution: Non-blocking read from both user input buffer and socket stream.
- If TA send messages too fast, the bot will receive several messages together, or even worse, the last message will be truncated.
  - Solution: Using a buffer to receive the message, and use a `generator` in Python to parse the string in buffer with `\r\n`, and throw out a line of message in one time. If both the buffer and socket stream is empty, throw out the empty string `''`.
- When the bot is typing message but has not sent out it yet, if the bot received a message from TA and print it out, the typed texts will be overwritten.
  - Solution: I haven't solved it yet.