Documentation for mini server and simple client:

Design Idea:

Since server is one of the required element, the functions were written as members of a file, more like member functions of a class, instead of writing individual processes for data processing and modeling. Also because of the requirement of querying server and without a database options (portable), the data are saved as files and variables are shared in RAM for querying purposes.

Overall, the modules are as follows: a server script with functions, a data module, a modeling module, and a client script.

Server script: (server.py)

This is the script that starts the mini server by setting up variables, creating threads for background process, listening client's connections, as well as capturing termination requests. The script realizes all the functions by running three threads after it starts. Detailed explanation is recorded in the server script comments.

Data module: (datadl.py)

This module contains functions that are essential for data processing. It is used like a class. Detailed function usages are in the file comment.

Modeling module: (proc.py)

This module contains functions that are used for calculating desired result. All functions in this module are planned to be programmed under numpy. See comments for detail.

Client script: (client.py)

This starts the client section by allowing user to setup server addresses and ports, then waiting for user's input and display returned result from server. See comments for detail.

Improvements:

This is a prototype of the mini server and client, and there are still bugs in the system. For each function improvements, please check "Imp" section under each function comment section.

Flowchart Demonstration:

Using a flow chart to demonstrate:

```
                          ┌──────────────────────────────┐
                          │        SERVER STARTS          │
                          └──────────────────────────────┘
                         /                                \
                        /                                  \
   ┌──────────────────────────┐            ┌──────────────────────────────┐
   │  ┌────────────────────┐  │            │   ┌────────────────────────┐  │
   │  │   Data Download    │  │            │   │   Handles Connection   │  │
   │  └────────────────────┘  │            │   └────────────────────────┘  │
   │  ┌────────────────────┐  │            │                               │
   │  │    Data Update     │  │            │   Client Thread - supports    │
   │  └────────────────────┘  │            │   up to fixed number of       │
   │                          │            │   clients                     │
   │ Background Thread        │            │                               │
   │ (data & model)           │            │   ┌────────────────────────┐  │
   │                          │            │   │   Processing &          │  │
   │  ┌────────────────────┐  │            │   │   communicating Request │  │
   │  │  Process (modeling)│  │            │   └────────────────────────┘  │
   │  └────────────────────┘  │            └──────────────────────────────┘
   │  ┌────────────────────┐  │                          \
   │  │      Saving        │  │                           \
   │  └────────────────────┘  │                            \
   └──────────────────────────┘                             \
                                                              \
              ┌────────────────────────────────────────────────┐
              │                  CLIENT START                   │
              └────────────────────────────────────────────────┘
```