

## **NSAPDEV/NSEMBED FINAL PROJECT - Manual**

### **1. Client (Embedded System)**

1.1. Open the ESP32 code and modify the following items:

| Parameter       | Description  |
|-----------------|--|
| dev_id          | Unique identifier for the embedded system (equivalent to hostname) |
| ssid            | SSID of the WiFi Network   |
| password        | Password of the WiFi Network                                       |
| server          | IPv4 Address of the Server   |
| port (Optional) | Port of the Server (Default must be 8080 unless specified).        |

```

29 String dev_id = "ESP_0";
30
31
32 char* ssid = "<SSID>";
33 char* password = "<SSID PW>";
34 char* server = "<IP of Server>";
35 const uint16_t port = 8080;
36 bool serverFlag = false;

```

*Embedded System Connection Parameters*

1.2. Click Upload on Arduino IDE and let it upload to the ESP32.

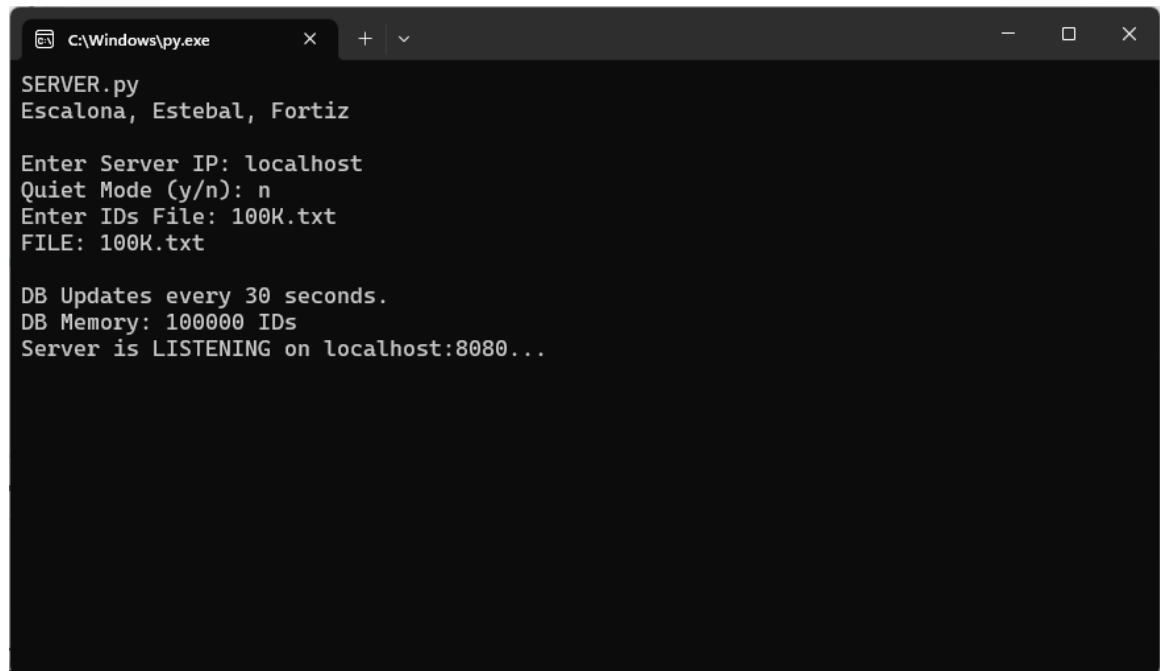
### **2. Server**

2.1. Check the dictionary of choice and make sure that its contents include the sample ID that you'd wanna try out as the tapped ID value will be invalid otherwise.

2.2. Launch the server by running "py Server.py" or by double-clicking on the Server.py file

2.3. Enter the following inputs as asked by the application:

| Input             | Description   |
|-------------------|---|
| Enter Server IP:  | IP address of the server (IPv4 address or localhost)              |
| Quiet Mode (y/n): | Enter 'Y' or 'N' to set if the server will printout transactions. |
| FILE: 100K.txt    | Enter the DB file to use as a list of valid IDs                   |



```

C:\Windows\py.exe
SERVER.py
Escalona, Estebal, Fortiz

Enter Server IP: localhost
Quiet Mode (y/n): n
Enter IDs File: 100K.txt
FILE: 100K.txt

DB Updates every 30 seconds.
DB Memory: 100000 IDs
Server is LISTENING on localhost:8080...

```

*Server Running*

### 3. Client (Simulator)

3.1. Modify the Client.py file to exclude ID values from being included in the simulator for isolated testing.

```

LATENCY_CTR = 0
EXCEPTIONS = ['XXXXXXXXXXXXXXXXXXXX', 'XXXXXXXXXXXXXXXXXXXX']

```

*ID Value Exceptions*

3.2. Launch the server by running “py Client.py” or by double-clicking on the Client.py file

## 3.3. Enter the following inputs as asked by the application:

| Input                         | Description  |
|-------------------------------|--|
| Enter Target Server IP:       | Enter IP address of the target server (IPv4 address or localhost)  |
| Use ID List? (Y/N):           | Enter 'Y' or 'N' to set if the client will use a premade ID list.<br><br>Selecting 'N' will replace "Enter IDs File:" input with a random generator  |
| Enter IDs File:               | Enter the DB file to use as a list of IDs to use in simulation.  |
| Enter no. of threads:         | Enter no. of threads to use in simulation  |
| Enter no. of IDs to generate: | Enter no. of IDs to generate for use in simulation.<br><br>Replaces the "Enter IDs File:" if 'N' was selected during "Use ID List? (Y/N):" question. |
| Quiet Mode (Y/N):             | Enter 'Y' or 'N' to set if the client will be verbose or not   |

```

C:\Windows\py.exe
CLIENT.py
Escalona, Estebal, Fortiz

Enter Target Server IP: localhost
Use ID List? (Y/N): y
Enter IDs File: 100K.txt
DB: 100000 IDs
Enter no. of threads:

```

*Client Setup (with ID List)*

```

C:\Windows\py.exe
CLIENT.py
Escalona, Estebal, Fortiz

Enter Target Server IP: 192.168.2.252
Use ID List? (Y/N): n
Enter no. of IDs to generate: 1000
DB: 1000 IDs
Enter no. of threads:

```

*Client Setup (without ID List)*

### 3.4. Complete the Client setup to run the client simulator.

```

C:\Windows\py.exe
2023-07-30 20:27:22.078819 [Thread 65] ]: d16541709545d18486ae63db8e6a654b - EXIT (3.86ms)
2023-07-30 20:27:22.110341 [Thread 66] ]: 300bb1cd5c6d89c06ada589066ae3bdf - ENTER (3.86ms)
2023-07-30 20:27:22.141341 [Thread 67] ]: fe692f8394026b5150873969efc16d97 - ENTER (3.84ms)
2023-07-30 20:27:22.188347 [Thread 68] ]: f4221dd5478329d6019aca498ae6a874 - ENTER (3.86ms)
2023-07-30 20:27:22.235866 [Thread 69] ]: 3bc4374a52546cb718e7a665bdc45177 - ENTER (3.86ms)
2023-07-30 20:27:22.267866 [Thread 70] ]: 56d3d86194ad677efd7be0ba47fab0d5 - ENTER (3.84ms)
2023-07-30 20:27:22.315391 [Thread 71] ]: 24fab6f3fa7fd4c3b9e5e0a8fbf9aac2 - ENTER (3.86ms)
2023-07-30 20:27:22.347393 [Thread 72] ]: 51e3d01ba8e03d67efc0e56e5846db05 - ENTER (3.84ms)
2023-07-30 20:27:22.394930 [Thread 73] ]: 944787b9440323e41eee200ce1b21dc2 - ENTER (3.84ms)
2023-07-30 20:27:22.442924 [Thread 74] ]: e1e136ebd6cba60c6c6db37a234f27aa2 - ENTER (3.87ms)
2023-07-30 20:27:22.474922 [Thread 75] ]: 85f7cd9d7f323736d7031fc4c1e13540 - ENTER (3.91ms)
2023-07-30 20:27:22.506473 [Thread 76] ]: 953e06477eca4bb769c335a6086f7bac - ENTER (3.94ms)
2023-07-30 20:27:22.554474 [Thread 77] ]: 3fd060f48f109d1fda26218288143534 - ENTER (3.99ms)
2023-07-30 20:27:22.601997 [Thread 78] ]: 8acffbbb106c3c951eda5840de2e95ba - ENTER (4.03ms)
2023-07-30 20:27:22.649998 [Thread 79] ]: 9d63c88302f5052abdc26ce7b45b70ae - ENTER (4.08ms)
2023-07-30 20:27:22.697520 [Thread 80] ]: 526d102546b8fd5ee3d1cea47b0e3843 - ENTER (4.13ms)
2023-07-30 20:27:22.745521 [Thread 81] ]: c4e36442baa7f9fb0d3de03026492b16 - ENTER (4.18ms)
2023-07-30 20:27:22.777530 [Thread 82] ]: 109d9040209a2852936b8394a35e0384 - ENTER (4.21ms)
2023-07-30 20:27:22.809059 [Thread 83] ]: 593211f48443911880df576abfbd0a6 - ENTER (4.24ms)
2023-07-30 20:27:22.841056 [Thread 84] ]: c57beb02663ca031b3685b288f523fe8 - ENTER (4.27ms)
2023-07-30 20:27:22.873062 [Thread 85] ]: 87be4584d45e75e5ae41a6eb3a89c612 - ENTER (4.3ms)
2023-07-30 20:27:22.905153 [Thread 86] ]: 29ae88fc776da7595c8b701aa54acaa2 - ENTER (4.34ms)
2023-07-30 20:27:22.953141 [Thread 87] ]: 17fd2fcdaa5f1f490b7c02653c14ff9a - ENTER (4.37ms)
2023-07-30 20:27:23.000671 [Thread 88] ]: 2bb3373ecd9a7e79b52fd14294ac523f - ENTER (4.37ms)
2023-07-30 20:27:23.048670 [Thread 89] ]: 48a1d8df82f3af46fc52fc201e71394a - ENTER (4.37ms)
2023-07-30 20:27:23.095193 [Thread 90] ]: 0c06dc32c497cb387158a391a9917b24 - ENTER (4.39ms)
2023-07-30 20:27:23.143194 [Thread 91] ]: c60d839bea197a92fc5f77303a6fc0d5 - ENTER (4.39ms)
2023-07-30 20:27:23.191209 [Thread 92] ]: c7c2d7ff3113efd75f7db125368a4294 - ENTER (4.39ms)
2023-07-30 20:27:23.238758 [Thread 93] ]: dc254053d4f92d1d90522c3024edafd4 - ENTER (4.39ms)
2023-07-30 20:27:23.270753 [Thread 94] ]: 0b1e81c9509f1682a303d7dfeec61fe5 - ENTER (4.37ms)

```

*Client Running (Not Quiet)*

```

C:\Windows\py.exe
CLIENT.py
Escalona, Estebal, Fortiz

No. of Threads: 100
No. of Samples: 46
Average Latency: 1.100652ms
|

```

### Client Running (Quiet)

```

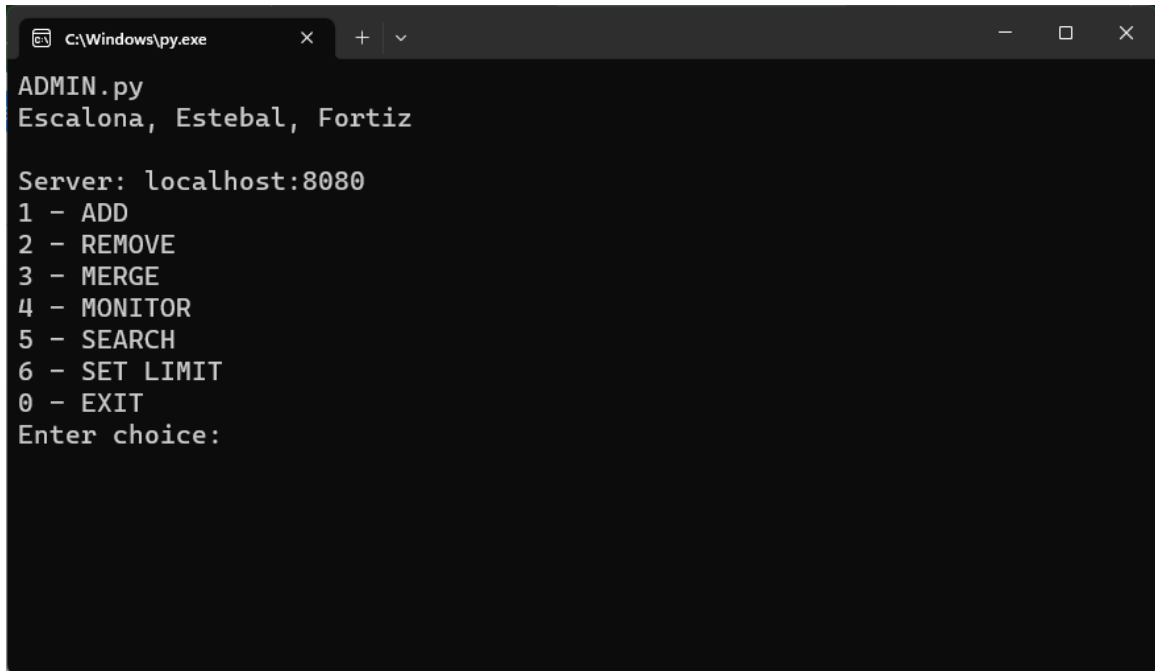
C:\Windows\py.exe
2023-07-30 20:30:06.658372 [127.0.0.1] : 954474592ba1005f250728fb60b4b471 - ENTER (2761/100000)
2023-07-30 20:30:06.705249 [127.0.0.1] : f6455f7e386cecfafa23eb3b8ec384aa - ENTER (2762/100000)
2023-07-30 20:30:06.752207 [127.0.0.1] : f8b0eeb176b10c265fbc7495642758d9 - ENTER (2763/100000)
2023-07-30 20:30:06.805561 [127.0.0.1] : 18e18911887d3ea8c61a0a790718efc7 - ENTER (2764/100000)
2023-07-30 20:30:06.852349 [127.0.0.1] : 711d31245fdece349e7e3c0cf2172ed4 - ENTER (2765/100000)
2023-07-30 20:30:06.899218 [127.0.0.1] : 3071cf335609567bcd73be87310953bc - ENTER (2766/100000)
2023-07-30 20:30:06.946521 [127.0.0.1] : be3cc5e3125515dacd02b41605990700 - ENTER (2767/100000)
2023-07-30 20:30:06.993406 [127.0.0.1] : 19642eaab497e58c5afd60be584db8f2 - ENTER (2768/100000)
2023-07-30 20:30:07.041650 [127.0.0.1] : 825507b7bc70644defa576294b9434f3 - ENTER (2769/100000)
2023-07-30 20:30:07.099084 [127.0.0.1] : 8598f73f63f5b4267f6989b36c49eb56 - ENTER (2770/100000)
2023-07-30 20:30:07.146378 [127.0.0.1] : 1ffea7d6abdc5d2c23a42b85a518e1a8 - ENTER (2771/100000)
2023-07-30 20:30:07.177634 [127.0.0.1] : 29dbf5b037a396be5df9021442741b95 - ENTER (2772/100000)
2023-07-30 20:30:07.224907 [127.0.0.1] : c712d89cb0887ecf15cdc2565fdbb4dc - ENTER (2773/100000)
2023-07-30 20:30:07.271800 [127.0.0.1] : bb207b27a6214a2256f70ba955cba344 - ENTER (2774/100000)
2023-07-30 20:30:07.318669 [127.0.0.1] : 7de92565cabbd82584d52d533624061b - ENTER (2775/100000)
2023-07-30 20:30:07.366276 [127.0.0.1] : 844daa87b315ba65aa11b51a91ab6897 - ENTER (2776/100000)
2023-07-30 20:30:07.413149 [127.0.0.1] : b37cba95e760609d87f19b5d36946b41 - ENTER (2777/100000)
2023-07-30 20:30:07.460455 [127.0.0.1] : a64a69af07534973c5011a752430195e - ENTER (2778/100000)
2023-07-30 20:30:07.492133 [127.0.0.1] : db12bb631ebba264370d89799ae43ad0 - ENTER (2779/100000)
2023-07-30 20:30:07.539413 [127.0.0.1] : 0b8b5b37e5057a91417a0fbf5a679bcf - ENTER (2780/100000)
2023-07-30 20:30:07.586292 [127.0.0.1] : c25b567d25f8db9ef452beb8f2fc2000 - ENTER (2781/100000)
2023-07-30 20:30:07.633997 [127.0.0.1] : e0905bb2f35f1f7d38e3de665cefcd34 - ENTER (2782/100000)
2023-07-30 20:30:07.666263 [127.0.0.1] : 3a618f9750d85f1fa80b9a8c9d1b2ff8 - ENTER (2783/100000)
2023-07-30 20:30:07.712551 [127.0.0.1] : 48f4f31f0aa60793e7ce7121b48580dd - ENTER (2784/100000)
2023-07-30 20:30:07.759845 [127.0.0.1] : 829d4a6cc9f2b2cd996a94f89ccfd028 - ENTER (2785/100000)

```

### Serverside View of Transactions

#### 4. Admin

- 4.1. Launch the server by running “py Admin.py” or by double-clicking on the Admin.py file
- 4.2. Enter IP address of target server
- 4.3. Navigate the Menu by entering the numbers indicated on each item



```
C:\Windows\py.exe
ADMIN.py
Escalona, Estebal, Fortiz

Server: localhost:8080
1 - ADD
2 - REMOVE
3 - MERGE
4 - MONITOR
5 - SEARCH
6 - SET LIMIT
0 - EXIT
Enter choice:
```

#### *Admin Main Menu*

- 4.4. Summary of each item/functionality are as follows:

| Function/Item | Description  |
|---------------|--|
| ADD           | Add a specific ID to the server application's DB Memory<br><br>*Note that the changes made here are written to the actual file once the server triggers its DB update.     |
| REMOVE        | Removes a specific ID to the server application's DB Memory<br><br>*Note that the changes made here are written to the actual file once the server triggers its DB update. |
| MERGE         | Adds a specific batch of IDs to the server   |

|           |   |
|-----------|---|
|           | application's DB Memory from a given ID list file.<br><br>*Note that the changes made here are written to the actual file once the server triggers its DB update. |
| MONITOR   | Displays a continuous live monitoring of the no. of people that have registered to enter the premises.  |
| SEARCH    | Searches for an ID if it is valid (FOUND) or not (!FOUND)   |
| SET LIMIT | Sets the LIMIT value of the server (i.e., max no. of people to be in premises).   |
| EXIT      | Exit Admin.py   |