محمدمهدی بقائی ۴۰۰۱۳۰۶۶۳

۱.

مدیریت نام کاربری: نام کاربری را از کاربر دریافت و به پیام‌ها اضافه می‌کند

استخراج نام کاربری: نام کاربری را از پیام دریافتی استخراج می‌کند و به شناسایی کاربر در چت کمک می‌کند.

در خطوط ۳ و ۴ و ۱۰ و ۱۱ ورود کاربر جدید را نشان میدهد، از خطوط ۱۳ تا ۴۰ روند ارسال و دریافت پیام دیده میشود که ابتدا پیام توسط کلاینت ارسال میشود به سمت سرور بعد تاییدیه ارسال میشود سپس ارسال پیام توسط سرور به کلاینت های دیگر ، که در اینجا چون IP را روی ۱۲۷.۰.۰.۱ قراردادیم متاسفانه کاملا مشخص نیست اما از روی port ها میتوان این روند را مشاهده کرد.

No.	Time	Source	Destination Port	Destination	Protocol	Length	Info
1	0.000000	127.0.0.1	49674	127.0.0.1	TCP	45	49749 → 49674 [ACK] Seq=1 Ack=1 Win=8442 Len=1
2	0.000028	127.0.0.1	49749	127.0.0.1	TCP	56	49674 → 49749 [ACK] Seq=1 Ack=2 Win=8437 Len=1 SLE=1 SRE=
3	13.751239	127.0.0.1	8080	127.0.0.1	TCP	56	50447 → 8080 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SAC
4	13.751280	127.0.0.1	50447	127.0.0.1	TCP	56	8080 → 50447 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=25
5	13.751326	127.0.0.1	8080	127.0.0.1	TCP	44	50447 → 8080 [ACK] Seq=1 Ack=1 Win=327424 Len=0
6	45.000288	127.0.0.1	49674	127.0.0.1	TCP	45	[TCP Keep-Alive] 49749 → 49674 [ACK] Seq=1 Ack=1 Win=8442 Le
7	45.000323	127.0.0.1	49749	127.0.0.1	TCP	56	[TCP Keep-Alive ACK] 49674 → 49749 [ACK] Seq=1 Ack=2 Win=8437 Len=0
8	90.001052	127.0.0.1	49674	127.0.0.1	TCP	45	[TCP Keep-Alive] 49749 → 49674 [ACK] Seq=1 Ack=1 Win=8442 Le
9	90.001103	127.0.0.1	49749	127.0.0.1	TCP	56	[TCP Keep-Alive ACK] 49674 → 49749 [ACK] Seq=1 Ack=2 Win=8437 Len=0
10	105.805482	127.0.0.1	8080	127.0.0.1	TCP	56	50492 → 8080 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SAC
11	105.805517	127.0.0.1	50492	127.0.0.1	TCP	56	8080 → 50492 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=25
12	105.805554	127.0.0.1	8080	127.0.0.1	TCP	44	50492 → 8080 [ACK] Seq=1 Ack=1 Win=327424 Len=0
13	125.437559	127.0.0.1	8080	127.0.0.1	TCP	57	50492 → 8080 [PSH, ACK] Seq=1 Ack=1 Win=327424 Len=13 [TCP segment of
14	125.437608	127.0.0.1	50492	127.0.0.1	TCP	44	8080 → 50492 [ACK] Seq=1 Ack=14 Win=2161152 Len=0
15	125.437883	127.0.0.1	50447	127.0.0.1	TCP	58	8080 → 50447 [PSH, ACK] Seq=1 Ack=1 Win=2161152 Len=14 [TCP segment o
16	125.437905	127.0.0.1	8080	127.0.0.1	TCP	44	50447 → 8080 [ACK] Seq=1 Ack=15 Win=327424 Len=0
17	135.012621	127.0.0.1	49674	127.0.0.1	TCP	45	[TCP Keep-Alive] 49749 → 49674 [ACK] Seq=1 Ack=1 Win=8442 Le
18	135.012643	127.0.0.1	49749	127.0.0.1	TCP	56	[TCP Keep-Alive ACK] 49674 → 49749 [ACK] Seq=1 Ack=2 Win=8437 Len=0
19	138.565782	127.0.0.1	8080	127.0.0.1	TCP	64	50447 → 8080 [PSH, ACK] Seq=1 Ack=15 Win=327424 Len=20 [TCP segment o
20	138.565839	127.0.0.1	50447	127.0.0.1	TCP	44	8080 → 50447 [ACK] Seq=15 Ack=21 Win=2161152 Len=0
21	138.566090	127.0.0.1	50492	127.0.0.1	TCP	65	8080 → 50492 [PSH, ACK] Seq=1 Ack=14 Win=2161152 Len=21 [TCP
22	138.566113	127.0.0.1	8080	127.0.0.1	TCP	44	50492 → 8080 [ACK] Seq=14 Ack=22 Win=327424 Len=0
23	147.524125	127.0.0.1	8080	127.0.0.1	TCP	58	50492 → 8080 [PSH, ACK] Seq=14 Ack=22 Win=327424 Len=14 [TCP segment
24	147.524177	127.0.0.1	50492	127.0.0.1	TCP	44	8080 → 50492 [ACK] Seq=22 Ack=28 Win=2161152 Len=0
25	147.524429	127.0.0.1	50447	127.0.0.1	TCP	59	8080 → 50447 [PSH, ACK] Seq=15 Ack=21 Win=2161152 Len=15 [TCP segment
26	147.524455	127.0.0.1	8080	127.0.0.1	TCP	44	50447 → 8080 [ACK] Seq=21 Ack=30 Win=327424 Len=0
27	159.824180	127.0.0.1	8080	127.0.0.1	TCP	60	50447 → 8080 [PSH, ACK] Seq=21 Ack=30 Win=327424 Len=16 [TCP segment
28	159.824235	127.0.0.1	50447	127.0.0.1	TCP	44	8080 → 50447 [ACK] Seq=30 Ack=37 Win=2161152 Len=0
29	159.824470	127.0.0.1	50492	127.0.0.1	TCP	61	8080 → 50492 [PSH, ACK] Seq=28 Ack=28 Win=2161152 Len=17 [TCP
30	159.824501	127.0.0.1	8080	127.0.0.1	TCP	44	50492 → 8080 [ACK] Seq=28 Ack=39 Win=327424 Len=0
31	166.544351	127.0.0.1	8080	127.0.0.1	TCP	62	50447 → 8080 [PSH, ACK] Seq=37 Ack=30 Win=327424 Len=18 [TCP segment
32	166.544385	127.0.0.1	50447	127.0.0.1	TCP	44	8080 → 50447 [ACK] Seq=30 Ack=55 Win=2161152 Len=0

```
Server is Running and waiting for connections...
('127.0.0.1', 50662) is connected to the server!
('127.0.0.1', 50669) is connected to the server!
('127.0.0.1', 50669) said babaei: salam
('127.0.0.1', 50662) said baghaei: salam aleik
('127.0.0.1', 50662) said baghaei: khobi?
('127.0.0.1', 50669) said babaei: mamnoon
('127.0.0.1', 50662) said baghaei: man beram
('127.0.0.1', 50662) said baghaei:
('127.0.0.1', 50669) said babaei: khodahafez
Connection with ('127.0.0.1', 50662) is closed: [WinError 10054] An existing connection was forcibly closed by the remote host
('127.0.0.1', 50662) has left the chatroom!
Connection with ('127.0.0.1', 50669) is closed: [WinError 10054] An existing connection was forcibly closed by the remote host
('127.0.0.1', 50669) has left the chatroom!
```

```
Please enter your username:
babaei
Type your message:
salam
Type your message:
baghaei:  salam aleik
baghaei:  khobi?
mamnoon
Type your message:
baghaei:  man beram
baghaei:
khodahafez
Type your message:
Connection is getting closed.
```

```
Please enter your username:
baghaei
Type your message:
babaei:  salam
salam aleik
Type your message:
khobi?
Type your message:
babaei:  mamnoon
man beram
Type your message:

Type your message:
babaei:  khodahafez
Connection is getting closed.
```

۲.

در خط ۱ و ۲ اتصال کلاینت به سرور دیده میشود و در خط ۳۶ قطع اتصال بعد از ارسال ۰ را میبینیم

در خط ۶ اعداد از کلاینت به سرور ارسال شده و در خط ۸ اعداد مرتب شده از سرور ارسال شده به کلاینت هم چنین در خطوط ۱۰ و ۱۲ و اعداد حذف شده توسط الگوریتم مرتب سازی استالین به کلاینت ارسال شده و در خط ۱۴ هم پیامی مبنی بر اتمام الگوریتم و مرتب شدن آن ارسال شده و از خط ۱۸ به بعد تا ۳۶ ، اعداد ارسال شده سری دوم و پیاده سازی الگوریتم مرتب سازی استالین بر آن دیده میشود

No.	Time	Source	Destination Port	Destination	Protocol	Length	Info
1	0.000000	127.0.0.1	8080	127.0.0.7	TCP	56	55905 → 8080 [SYN] Seq=0 Win=65535 Len=0 MSS=65495 WS=256 SAC
2	0.000048	127.0.0.7	55905	127.0.0.1	TCP	56	8080 → 55905 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=65495 WS=25
3	0.000085	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=1 Ack=1 Win=327424 Len=0
4	28.406939	192.168.1.10		224.0.0.251	MDNS	75	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QU" que
5	28.407200	fe80::4399:c183:ace…		ff02::fb	MDNS	95	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QU" que
6	28.903009	127.0.0.1	8080	127.0.0.7	TCP	63	55905 → 8080 [PSH, ACK] Seq=1 Ack=1 Win=327424 Len=19 [TCP segment of
7	28.903072	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=1 Ack=20 Win=2161152 Len=0
8	28.903181	127.0.0.7	55905	127.0.0.1	TCP	59	8080 → 55905 [PSH, ACK] Seq=1 Ack=20 Win=2161152 Len=15 [TCP segment
9	28.903222	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=16 Win=327424 Len=0
10	28.903243	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=16 Ack=20 Win=2161152 Len=66
11	28.903261	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=82 Win=327168 Len=0
12	28.903292	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=82 Ack=20 Win=2161152 Len=66
13	28.903309	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=148 Win=327168 Len=0
14	28.903322	127.0.0.7	55905	127.0.0.1	TCP	61	8080 → 55905 [PSH, ACK] Seq=148 Ack=20 Win=2161152 Len=17 [TCP segment
15	28.903333	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=165 Win=327168 Len=0
16	29.408322	192.168.1.10		224.0.0.251	MDNS	75	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QM" que
17	29.408612	fe80::4399:c183:ace…		ff02::fb	MDNS	95	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QM" que
18	65.014590	127.0.0.1	8080	127.0.0.7	TCP	65	55905 → 8080 [PSH, ACK] Seq=20 Ack=165 Win=327168 Len=21 [TCP segment
19	65.014622	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=165 Ack=41 Win=2161152 Len=0
20	65.014694	127.0.0.7	55905	127.0.0.1	TCP	55	8080 → 55905 [PSH, ACK] Seq=165 Ack=41 Win=2161152 Len=11 [TCP segment
21	65.014731	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=176 Win=327168 Len=0
22	65.014746	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=176 Ack=41 Win=2161152 Len=66
23	65.014755	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=242 Win=327168 Len=0
24	65.014765	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=242 Ack=41 Win=2161152 Len=66
25	65.014773	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=308 Win=327168 Len=0
26	65.014782	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=308 Ack=41 Win=2161152 Len=66
27	65.014789	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=374 Win=326912 Len=0
28	65.014798	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=374 Ack=41 Win=2161152 Len=66
29	65.014805	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=440 Win=326912 Len=0
30	65.014814	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=440 Ack=41 Win=2161152 Len=66
31	65.014825	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=506 Win=326912 Len=0
32	65.014841	127.0.0.7	55905	127.0.0.1	TCP	61	8080 → 55905 [PSH, ACK] Seq=506 Ack=41 Win=2161152 Len=17 [TCP segment

No.	Time	Source	Destination Port	Destination	Protocol	Length	Info
7	28.903072	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=1 Ack=20 Win=2161152 Len=0
8	28.903181	127.0.0.7	55905	127.0.0.1	TCP	59	8080 → 55905 [PSH, ACK] Seq=1 Ack=20 Win=2161152 Len=15 [TCP segment
9	28.903222	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=16 Win=327424 Len=0
10	28.903243	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=16 Ack=20 Win=2161152 Len=66
11	28.903261	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=82 Win=327168 Len=0
12	28.903292	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=82 Ack=20 Win=2161152 Len=66
13	28.903309	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=148 Win=327168 Len=0
14	28.903322	127.0.0.7	55905	127.0.0.1	TCP	61	8080 → 55905 [PSH, ACK] Seq=148 Ack=20 Win=2161152 Len=17 [TCP segment
15	28.903333	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=20 Ack=165 Win=327168 Len=0
16	29.408322	192.168.1.10		224.0.0.251	MDNS	75	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QM" que
17	29.408612	fe80::4399:c183:ace…		ff02::fb	MDNS	95	Standard query 0x0000 PTR _microsoft_mcc._tcp.local, "QM" que
18	65.014590	127.0.0.1	8080	127.0.0.7	TCP	65	55905 → 8080 [PSH, ACK] Seq=20 Ack=165 Win=327168 Len=21 [TCP segment
19	65.014622	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=165 Ack=41 Win=2161152 Len=0
20	65.014694	127.0.0.7	55905	127.0.0.1	TCP	55	8080 → 55905 [PSH, ACK] Seq=165 Ack=41 Win=2161152 Len=11 [TCP segment
21	65.014731	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=176 Win=327168 Len=0
22	65.014746	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=176 Ack=41 Win=2161152 Len=66
23	65.014755	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=242 Win=327168 Len=0
24	65.014765	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=242 Ack=41 Win=2161152 Len=66
25	65.014773	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=308 Win=327168 Len=0
26	65.014782	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=308 Ack=41 Win=2161152 Len=66
27	65.014789	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=374 Win=326912 Len=0
28	65.014798	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=374 Ack=41 Win=2161152 Len=66
29	65.014805	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=440 Win=326912 Len=0
30	65.014814	127.0.0.7	55905	127.0.0.1	TCP	110	8080 → 55905 [PSH, ACK] Seq=440 Ack=41 Win=2161152 Len=66
31	65.014825	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=506 Win=326912 Len=0
32	65.014841	127.0.0.7	55905	127.0.0.1	TCP	61	8080 → 55905 [PSH, ACK] Seq=506 Ack=41 Win=2161152 Len=17 [TCP segment
33	65.014853	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [ACK] Seq=41 Ack=523 Win=326912 Len=0
34	68.018227	127.0.0.1	8080	127.0.0.7	TCP	45	55905 → 8080 [PSH, ACK] Seq=41 Ack=523 Win=326912 Len=1 [TCP segment
35	68.018295	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=523 Ack=42 Win=2161152 Len=0
36	68.018364	127.0.0.1	8080	127.0.0.7	TCP	44	55905 → 8080 [FIN, ACK] Seq=42 Ack=523 Win=326912 Len=0
37	68.018375	127.0.0.7	55905	127.0.0.1	TCP	44	8080 → 55905 [ACK] Seq=523 Ack=43 Win=2161152 Len=0

```
Microsoft Windows [Version 10.0.22631.3527]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>C:/Users/BAGHAEI/AppData/Local/Programs/Python/Python310/python.exe c:/Users/BAGHAEI/OneDrive/Deskto
p/5/server2.py
Server is listening...
Connection established with ('127.0.0.1', 55905)
Numbers received from 127.0.0.1:55905: [1, 2, 3, 3, 2, 1, 4, 5, 6, 8, 1, 2, 3, 7, 5, 6, 2, 1, 4, 7, 9]
```

```
Microsoft Windows [Version 10.0.22631.3527]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>C:/Users/BAGHAEI/AppData/Local/Programs/Python/Python310/python.exe c:/Users/BAGHAEI/OneDrive/Deskto
p/5/client2.py
Enter a list of numbers (separated by spaces), 0 to exit: 1 2 3 3 2 1 4 5 6 8
Sorted array: 1 2 3 3 4 5 6 8
Out-of-order element detected and removed: 2 from 127.0.0.1:55905
Out-of-order element detected and removed: 1 from 127.0.0.1:55905
Disorder detected
Enter a list of numbers (separated by spaces), 0 to exit: 1 2 3 7 5 6 2 1 4 7 9
Sorted array: 1 2 3 7 7 9
Out-of-order element detected and removed: 5 from 127.0.0.1:55905
Out-of-order element detected and removed: 6 from 127.0.0.1:55905
Out-of-order element detected and removed: 2 from 127.0.0.1:55905
Out-of-order element detected and removed: 1 from 127.0.0.1:55905
Out-of-order element detected and removed: 4 from 127.0.0.1:55905
Disorder detected
Enter a list of numbers (separated by spaces), 0 to exit: 0
```