

Server

Server reads data file to recognize providers and creates a thread for all of them. They wait until a client who wants their service connects to the server.

Server creates a tcp server and waits for a client to connect.

Server handles all clients as a thread first, and then it will forward the client according to its parameter to one of the providers from threadpool. If a provider's queue is full, the client will be forwarded to next best client for its interest.

Usage: executable's name, port number, data file, log file

```
gtusvy@debian:~/Desktop/final$ ./homeworkServer 5555 data.dat log.dat  
7 providers with the following infos are read from file
```

After reading providers information from the file provided, the server shows the user a screen similar to the one below.

```
gtusvy@debian:~/Desktop/final$ ./homeworkServer data.dat log.dat  
7 providers with the following infos are read from file  
Ayse 5 900 60  
Fatma 3 500 180  
Murat 2 200 360  
Hakan 4 750 240  
Cengiz 1 75 600  
Nuray 3 450 90  
Ertan 4 600 120  
  
server is waiting for clients at port 1234  
  
Provider Nuray is waiting for a task  
Provider Ertan is waiting for a task  
Provider Cengiz is waiting for a task  
Provider Hakan is waiting for a task  
Provider Murat is waiting for a task  
Provider Fatma is waiting for a task  
Provider Ayse is waiting for a task
```

While clients are keep connecting to the server, the server gives us the detail of the operations performed

```
>>>Client with pid 11973 ibrahim c 23 is connected and forwarded to provider Cengiz
>>>Client with pid 11974 ibrahim c 56 is connected and forwarded to provider Murat
>>>Client with pid 11975 ibrahim c 13 is connected and forwarded to provider Murat
Provider Fatma is processing task of finding cos(4)
>>>Client with pid 11976 yavuz t 56 is connected and forwarded to provider Hakan
>>>Client with pid 11977 fatih t 4 is connected and forwarded to provider Nuray
>>>Client with pid 11978 ibrahim c 23 is connected and forwarded to provider Nuray
>>>Client with pid 11979 ibrahim c 56 is connected and forwarded to provider Fatma
>>>Client with pid 11980 ibrahim c 13 is connected and forwarded to provider Ertan
Provider Nuray is processing task of finding cos(4)
>>>Client with pid 11981 yavuz t 56 is connected and forwarded to provider Ayse
Provider Ayse is processing task of finding cos(56)
Provider Cengiz is processing task of finding cos(13)
Provider Murat is processing task of finding cos(56)
Provider Hakan is processing task of finding cos(56)
>>>Client with pid 11982 melih Q 45 is connected and forwarded to provider Ayse
Provider Ayse is busy. Next best choice will be chosen
Provider Ertan is processing task of finding cos(13)
Provider Hakan has completed the task in 0.00 seconds. cos(56) = 0.56
Provider Hakan is waiting for a task
Provider Ertan has completed the task in 0.00 seconds. cos(13) = 0.97
Provider Ertan is waiting for a task
Provider Murat has completed the task in 0.97 seconds. cos(56) = 0.56
```

When the server is stopped by sigint, we can see the statistics of providers

```
Provider Murat has completed the task in 9.75 seconds. cos(13) = 0.97
Provider Murat is waiting for a task
Provider Nuray has completed the task in 10.72 seconds. cos(23) = 0.92
Provider Nuray is waiting for a task
^C
SIGINT ist caught in server
Sockets are being closed. Clients are being informed and allocated memory is being freed
*** Statistics ***
Name      Number of Clients served
Ayse      4
Fatma     4
Murat     4
Hakan     2
Cengiz    4
Nuray     4
Ertan     3
gtusvy@debian:~/Desktop/final$
```

Client

A client will connect to a server and request a mathematical calculation to be performed by a provider for which the client's parameter wish. The client waits until it gets to the result from the server. And then the client will show the details of this delivery and closes itself.

Usage: exe's name, client name. Priority, homework, IP, port

```
gtusvy@debian:~/Desktop/final$ ./clientApp ibrahim Q 45 127.0.0.1 5555
Client ibrahim is requesting Q 45 from server 127.0.0.1 5555
```

After connecting 4 clients in a row with a script, we see a screen similar to the one below

```
gtusvy@debian:~/Desktop/finals$ ./a.sh
Client ibrahim is requesting c 13 from server 127.0.0.1:5555
Client wayne is requesting t 56 from server 127.0.0.1:5555
Client yasuo is requesting t 4 from server 127.0.0.1:5555
Client jax is requesting Q 45 from server 127.0.0.1:5555
wayne's task completed by Ayse in 6.96 seconds, cos(56) = 0.56, cost = 900TL, total spent time 13.96 seconds.
ibrahim's task completed by Cengiz in 7.94 seconds, cos(13) = 0.97, cost = 75TL, total spent time 15.94 seconds.
yasuo's task completed by Fatma in 12.91 seconds, cos(4) = 1.00, cost = 500TL, total spent time 25.91 seconds.
jax's task completed by Ayse in 13.90 seconds, cos(45) = 0.71, cost = 900TL, total spent time 34.90 seconds.
gtusvy@debian:~/Desktop/finals$
```

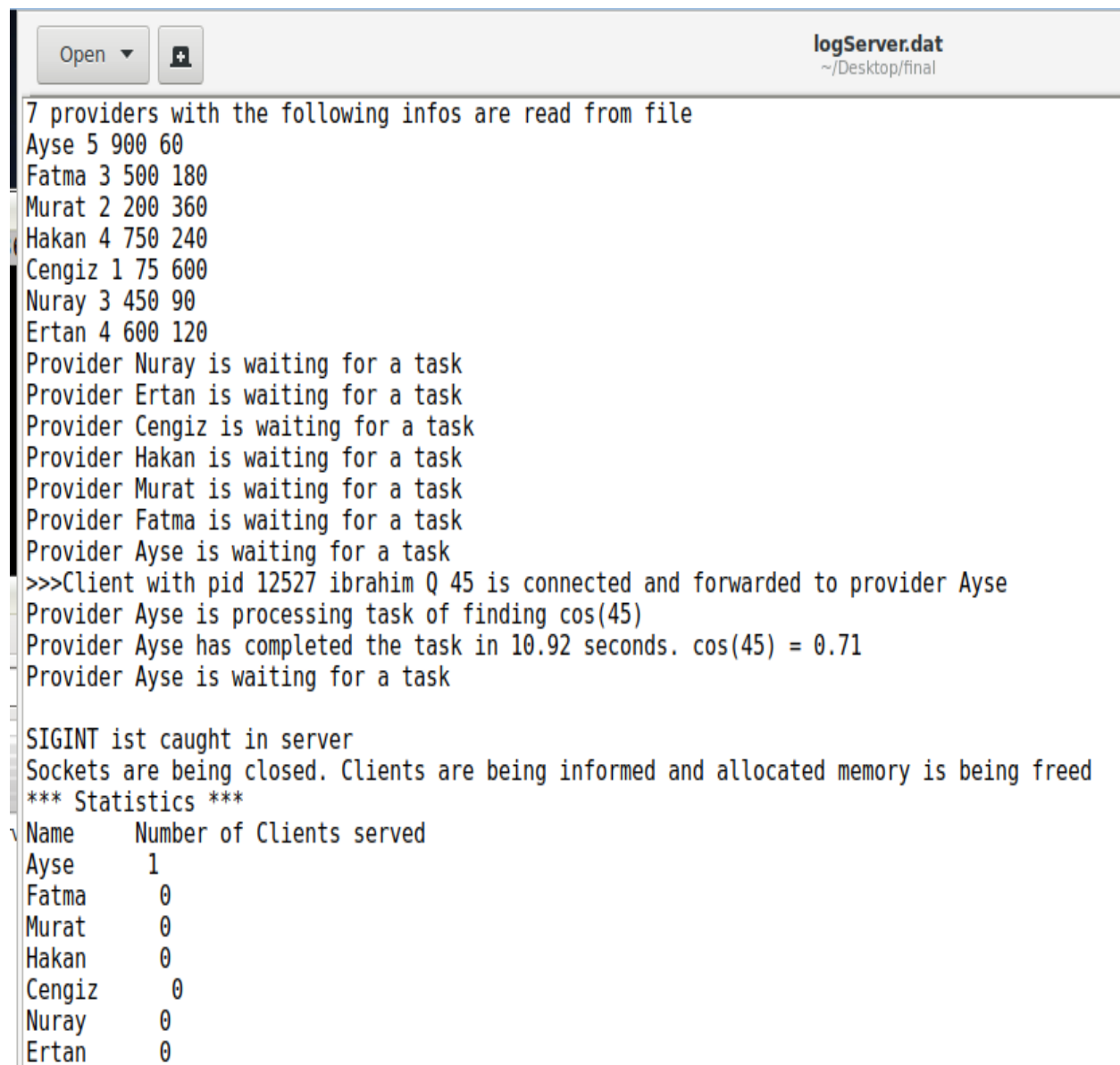
If sigint is caught, then client shut itself off gracefully with creating its socket and log file

[illegible]

Log Files

Log files save all the information we see on the terminal to a file corresponding to its role, client or server. Below you can see two example log files and their contents.

Server Log file looks like this



The screenshot shows a text editor window with the title bar "logServer.dat" and the path "~/Desktop/final". The window contains the following text:

```
Open ▾ [icon]
logServer.dat
~/Desktop/final

7 providers with the following infos are read from file
Ayse 5 900 60
Fatma 3 500 180
Murat 2 200 360
Hakan 4 750 240
Cengiz 1 75 600
Nuray 3 450 90
Ertan 4 600 120
Provider Nuray is waiting for a task
Provider Ertan is waiting for a task
Provider Cengiz is waiting for a task
Provider Hakan is waiting for a task
Provider Murat is waiting for a task
Provider Fatma is waiting for a task
Provider Ayse is waiting for a task
>>>Client with pid 12527 ibrahim Q 45 is connected and forwarded to provider Ayse
Provider Ayse is processing task of finding cos(45)
Provider Ayse has completed the task in 10.92 seconds. cos(45) = 0.71
Provider Ayse is waiting for a task

SIGINT ist caught in server
Sockets are being closed. Clients are being informed and allocated memory is being freed
*** Statistics ***
Name      Number of Clients served
Ayse      1
Fatma     0
Murat     0
Hakan     0
Cengiz    0
Nuray     0
Ertan     0
```

Client log file

Client yasuo is requesting t 4 from server 127.0.0.1:5555
yasuo's task completed by Fatma in 4.96 seconds, $\cos(4) = 1.00$, cost = 500TL, total spent time 9.96 seconds.
Client ibrahim is requesting c 13 from server 127.0.0.1:5555
ibrahim's task completed by Cengiz in 6.93 seconds, $\cos(13) = 0.97$, cost = 75TL, total spent time 13.93 seconds.
Client ryze is requesting t 4 from server 127.0.0.1:5555
ryze's task completed by Murat in 8.89 seconds, $\cos(4) = 1.00$, cost = 200TL, total spent time 17.89 seconds.
Client ekko is requesting t 4 from server 127.0.0.1:5555
ekko's task completed by Nuray in 9.87 seconds, $\cos(4) = 1.00$, cost = 450TL, total spent time 19.87 seconds.
Client teemo is requesting t 4 from server 127.0.0.1:5555
teemo's task completed by Hakan in 12.85 seconds, $\cos(4) = 1.00$, cost = 750TL, total spent time 25.85 seconds.
Client vayne is requesting t 56 from server 127.0.0.1:5555
vayne's task completed by Ayse in 12.85 seconds, $\cos(56) = 0.56$, cost = 900TL, total spent time 25.85 seconds.
Client jax is requesting Q 45 from server 127.0.0.1:5555
jax's task completed by Ayse in 10.84 seconds, $\cos(45) = 0.71$, cost = 900TL, total spent time 34.84 seconds.