

Instructions to Run the program:

Build system: Linux(Ubuntu)

Steps:

Unzip the bitcoin.zip. File

Server:

change directory to Server

Path: bitcoin/Server

Execute the following command:

```
sbt "project Server" "run 4"
```

Client:

change directory to Client

Path: bitcoin/Client

```
sbt "project Client" "run 127.0.0.1"
```

Make sure to start the Server before Client.

127.0.0.1 is the link local ip here.

If you want to run Client and Servers on two different machines then make sure to change the IP Address to which the application will bind to:

In order to achieve this make the following changes:

Client/src/main/resources/application.conf -->Change hostname to client machine's IP.

Server/src/main/resources/application.conf -->Change hostname to its system ip.

Give the server's ip when running sbt from Client side.

```
sbt "project driver" "run <Server IP-Modify>"
```

All bitcoins mined from both - Server and Client will be displayed in the terminal on which the server has been invoked.

1. Size of Work Unit for best performance:

Worksize-Chunk of work allocated to individual actors = 100000

TotalTries -Number of attempts made by worker inclusive of server and client = 1000

The number of workers they are assigned work in round robin fashion for proper load balancing

Server:

Real Time 25m59.178s

CPU Time 96m27.060s

Ratio= ~3.7

Client:

Real Time 25m12.136s

CPU Time 89m27.616s

Ratio= ~3.5

2. The result of running program for k=4:

Worksize=10000

TotalTries=100

souravkparmarie9ShszjWlaxysads

0000130cf3fd290e4fe778bacb94547da946a56038cc05f335af573ac8b3deca

souravkparmarP5Wm0YhKxsaxysads

0000a80ef8e480e4a6843566467376af67e6f821aae5990a38ba5f79542a118c

souravkparmarqSdYWTuRTEaxysads

00001e49fdd66270ca781bb4fe896ffee6867bbd366922a4f590e9729917032e

souravkparmarNC4HhR5Y0daxysads

0000c570a552dd756a371379afd0ab386eff2bb03b1525c7dab660d4baf5bb7a

souravkparmark08nlgkGB9axysads

0000d20b35ba1b1f63eabe2a926a9df2ef751b6dff9e2ee1cc62d363ca0cf173

souravkparmaryUpWjpQfpBaxysads

00001242c425fe4b349765c76faae6273e68f28df96610b825325c8b3f0ce07b

souravkparmarYu2VO0DmYkaxysads

000025ebf275c609960a583b99253fb298d84d37457f89f7b2ed517eba9ccaa1

souravkparmarbUQWpH41SHaxysads

00006d239b36218ca33ae3e7fc90434558ed5cf0623e5904140842a49d168fdc

souravkparmark2HhjDSzRBaxysads

00002119582102987de82d0e79c045c629b4e5a49c4ffcf5effe7a01a2ebb64e

souravkparmarQPfrlGT32naxysads

0000380306f5ac3edea70902eddb2253f00c272072227dff1dd370a1e5d48ee6

3. CPU time vs Real time for the above input 5.

Server:

Real Time 4m0.797s

CPU Time 13m29.572s

Client:

Real Time 3m13.008s

CPU Time 10m9.237s

4. Mined bitcoin with maximum number of zeros: 7

souravkparmarWOvZWYvM18axysads

0000000cc25615c8e67e9e27d9985b466f01a3bfa6102322551554a4153d2624

5. Largest Number of working machines tested: 3