**COP 5615 Fall 2014**

**Distributed Operating Systems**

**Alin Dobra**

**Project 1**

**Mining Bit coins with given number of leading zeroes by implementing actor model using Akka and Scala**

**Submitted By:**

**Team Member : 1**

**Name : Abhishek Singh Panesar**

**Email :** [**asp.abhi18@ufl.edu**](mailto:asp.abhi18@ufl.edu)

**UFID : 5111-8921**

**Team Member : 2**

**Name : Nishit Sadhwani**

**Email :** [**n.sadhwani@ufl.edu**](mailto:n.sadhwani@ufl.edu)

**UFID : 5393-5598**

**------------------------------------------------------------------------**  
How to run the code  
**------------------------------------------------------------------------**  
You will require

Java version of lower than 1.8, i.e Java verion 1.7 or lower.  
You need to have **sbt** as well.

There are two folders namely Server and Client.

You need to go into the directories of these two folders using CD command.

**For Standalone** command i.e scala Project1 5

You need to go into the Server directory (where build.sbt is located ) and then type **sbt** in the command prompt.

Then you should write **compile** in the sbt shell.  
After that you should type **run** 5 in that.  
Then you will get all the bitcoins with 5 leading zeroes.

**For Remote**

You need to open Server folder on one machine and Client folder on another machine.

Then do the same process as above.

Run the Server first, do run 5.

Then do run (IP of server ) on the client machine.

**-----------------------------------------------------------------------**

Size of work unit for which we have the best performance

**-----------------------------------------------------------------------**

The way our code was framed was the task would be given to the Master who will create the worker actors and allocate a certain chunk of Hash strings. The worker would then calculate the SHA-256 and check if the pattern matches the given amount of leading 0’s. When it’s done with it’s chunk, it would then be allotted another chunk. This process continues till we complete the total amount of Hash strings.

In the remote client case, the process would be very similar, just when the client machine pings the server for work, new worker would be created and it will be included in the pool of already assigned workers.

The work unit for which we have the best performance is

var noOfWorkers =12

var TotalElements =10000000

var ChunkSize = 10000

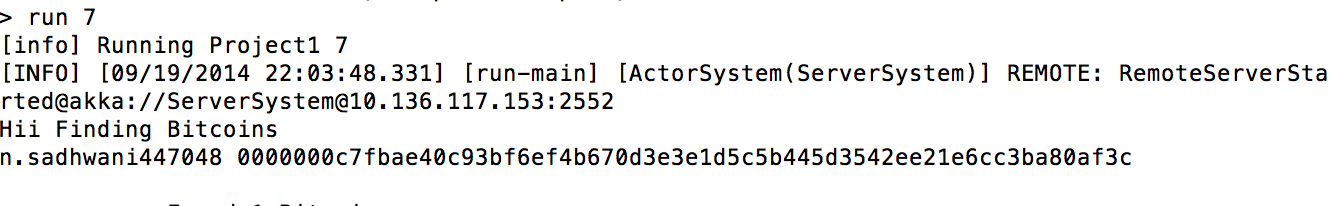
The reason behind this unit being the most optimum was that it demonstrated maximum amount of parallelism, as it was using almost all the cores in the machine.

**-----------------------------------------------------------------------**

Coin with most 0s we managed to find

**-----------------------------------------------------------------------**

A bit coin with 7 zeroes was the maximum we could dig into.



n.sadhwani447048 0000000c7fbae40c93bf6ef4b670d3e3e1d5c5b445d3542ee21e6cc3ba80af3c

**-----------------------------------------------------------------------**

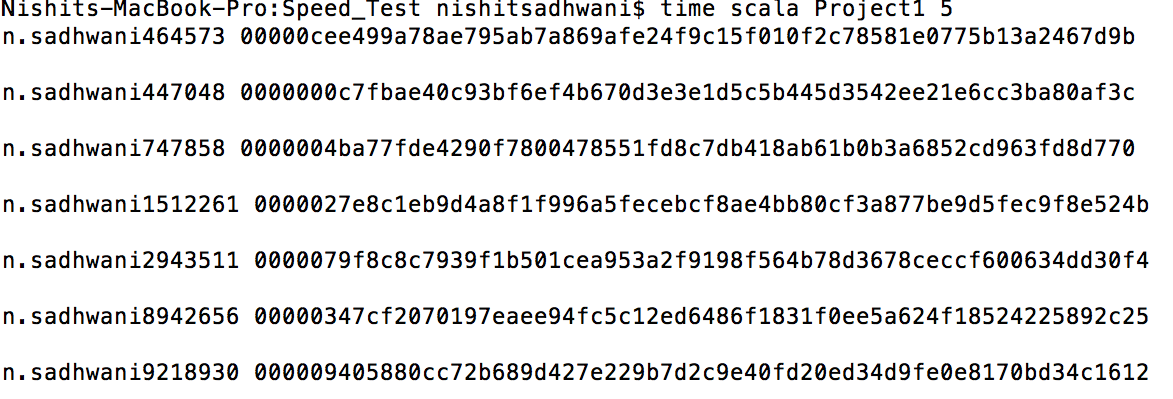
Running time for **scala Project1 5**

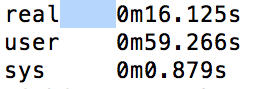
**-----------------------------------------------------------------------**

The configuration of the machine I was running this code on was :  


This was a quad core machine.

**Workers = 12 LeadingZeros = 5**





Number Of Cores = (user + sys) / real

= 60.145 / 16.125  
= 3.7590  
~ 4

**----------------------------------------------------------------------**Result of running the program for **scala Project1 4**

**-----------------------------------------------------------------------**

> run 4

[info] Running Project1 4

[INFO] [09/19/2014 21:57:37.773] [run-main] [ActorSystem(ServerSystem)] REMOTE: RemoteServerStarted@akka://ServerSystem@10.136.117.153:2552

Hii Finding Bitcoins

n.sadhwani47814 0000e856e1d7ea75bfc994fad4e3ce86bc5e2003ccb4b80e219e27c891dd7f64

n.sadhwani8116 0000e29a1debad94fdc1fff9e8ce23dfb71def835046c27aada701bd7dbf06e5

n.sadhwani247370 0000cedd2abb1fa0a074d393d8976a5625757fa50d7233a186dceb76f55f7626

n.sadhwani338300 0000daa01c62e6e7594964531b91b95a55ce2f156ce2226f3a6c18de8aae1cc0

n.sadhwani373125 0000b91849439f91f971efe433f733648f7568f860df13b8154499e1462314bb

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n.sadhwani464573 00000cee499a78ae795ab7a869afe24f9c15f010f2c78581e0775b13a2467d9b

n.sadhwani447048 0000000c7fbae40c93bf6ef4b670d3e3e1d5c5b445d3542ee21e6cc3ba80af3c

n.sadhwani543132 0000c48a0f5cc04ecd89293723259430b86a8dc8292617e4efe909d4d3cba487

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n.sadhwani9528045 0000a4dedac44e0b9924bd9cdc431cd7d8e46b394441a84360d3e476dbb8f150

n.sadhwani9672196 0000f7c45d0d107c826cfae5bab72812e101ab5de8b275f01086880c46898a26

n.sadhwani9628304 00006298a00b21b4be1197afb5546d139e738ed9089c9efda0d7a8c1f948aa9a

n.sadhwani9797378 0000d920124e18a8d77346003be2f141c0c50af0416f1910dba26d9c1d9e7852

\*\*\*\*\*\*\*\*\*\*\*\*Found 138 Bitcoins\*\*\*\*\*\*\*\*\*\*\*\*\*\*

.................Terminating...............

**-----------------------------------------------------------------------**

Largest number of working machines

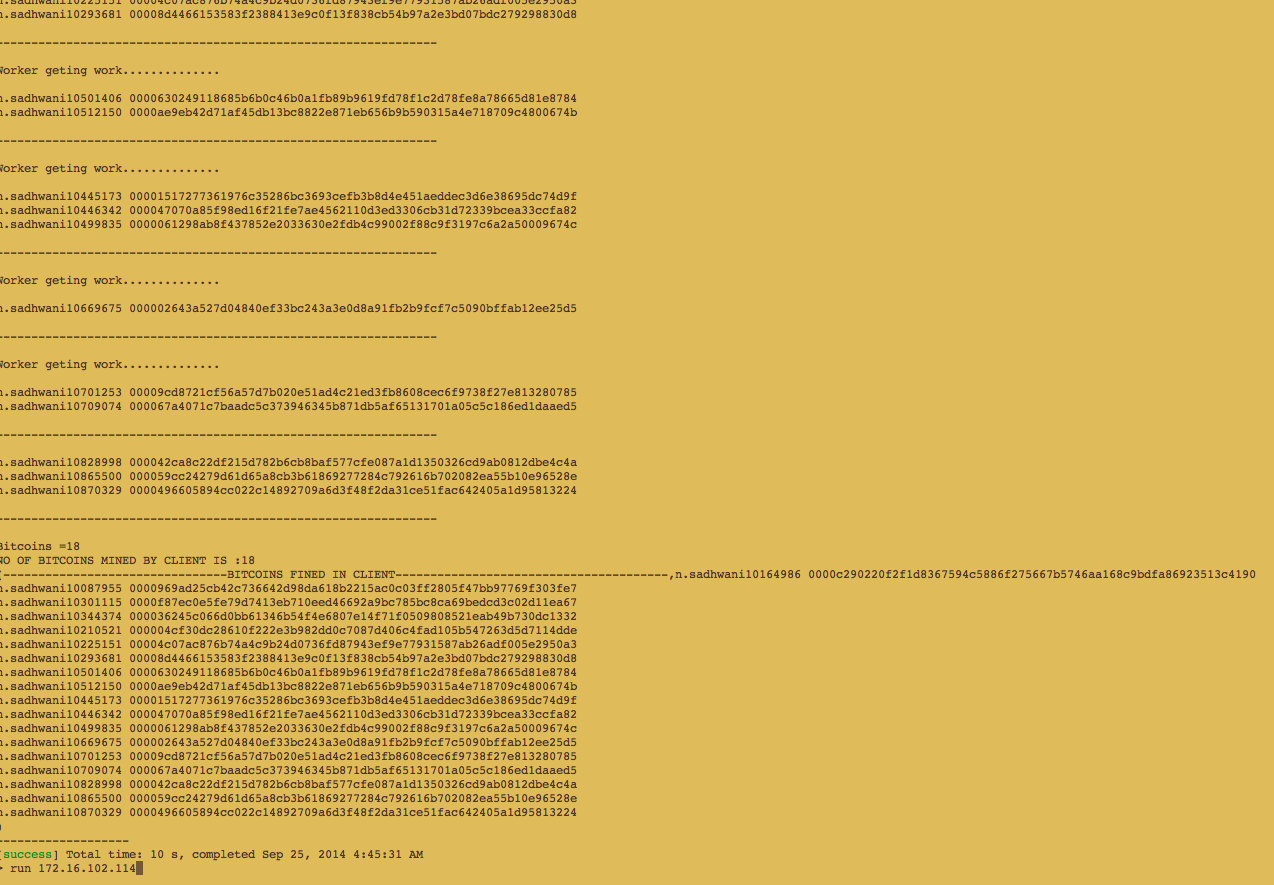
**-----------------------------------------------------------------------**

The largest number of machines that we could test the code on was 4

**Server Screenshot** :



**Client Screenshot :**

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