DOS – PROJECT 1 REPORT

STEPS TO RUN SERVER

1. Please set the AKKA_HOME variable in the shell. Which points to the root of akka package.
   a. Steps to get AKKA Dist.: `wget http://downloads.typesafe.com/akka/akka_2.10-2.3.6.zip`
   b. `unzip akka_2.10-2.3.6.zip`
   c. `export AKKA_HOME=/cise/homes/arungta/akka-2.3.6`

2. Unzip the project folder project1.zip
3. Go to `MyScalaProject/src`
4. `Run the shell script start.sh <leading # of zeros> to start the server. (This internally references scala 2.11 which is bundled with the project)`

STEPS TO START REMOTE WORKERS

1. Follow the same steps 1 to 3 mentioned above on a difference machine.
2. Run the shell script start.sh <ip address of the server to start a remote actor which connects to the server for work.

Note: By default Server Mode will bind on port # 12000 and Remote Worker Mode will bind on port # 13000

RESULTS

# 0's	# Actors	Work Unit	Limit	# Match	CPU Time	Real Time	Efficiency
5	2	10^4	10^6	3	10.052	4.393	2.28
5	5	10^4	10^6	3	14.540	4.300	3.38
5	10	10^4	10^6	3	15.650	4.592	3.40
5	5	10^5	10^6	3	13.850	4.008	3.45
5	10	10^5	10^6	3	14.885	4.221	3.52
5	5	10^5	10^7	12	100	28	3.57
5	**10**	**10^5**	**10^7**	**12**	**104.00**	**28.276**	**3.678**
5	50	10^6	10^8	12	1000	280	3.57
6	100	10^4	10^7	1	104	28.9	3.59
7	100	10^5	10^9	6	10200	2900	3.517

1. Execution for 4 leading Zeros: time scala project1.scala 4

```
Abhinavs-MacBook-Air:src abhinavrungta$ ./start.sh 4
[INFO] [09/18/2014 20:23:13.224] [main] [Remoting] Starting remoting
[INFO] [09/18/2014 20:23:13.459] [main] [Remoting] Remoting started; listening on addresses :[akka.tcp://BitCoinSystem@10.136.50.74:12000]
[INFO] [09/18/2014 20:23:13.462] [main] [Remoting] Remoting now listens on addresses: [akka.tcp://BitCoinSystem@10.136.50.74:12000]
asrivastavaUJN  0000b4fd009767c95a1fa06e43d8651385877829471e0dfbc737ff8268c1d0a7
asrivastavaBBVA 0000d40ffd60b6c632656f6781f2dfee31579d3810b89ca74671be0b921dbf65
asrivastavaJGQA 000089983124428762 3bcb1a74230f2d0efdc460d80c859dcc708e2a3d282f06
asrivastavaFDXU 00000094708a4958f933c63221526efe2727cecf691c187c0dfd822498796ce8
asrivastavaKOQG 00005d5c1e2e313b642c54772550f9469abc0e1c8db8e07cda1117559ed5a45b
asrivastavaMGJU 00007e60e26d45d2d5a194871559103a70d5148214bc4b77b6b452e24b074aba
asrivastavaPAXD 00000879226d3583b992c4abd42109681058b9a4427ca64a835b76b51449bbbe
asrivastavaAMYCH        0000a3ea272a2b392fe3b36fcfdfce55c70a983fd8382dded46d3f624f0d9ae7
asrivastavaAPDPW        000037bff589ef06e1b39443e64989d8d4500f10a78f73db74835ca39fc32a0a
asrivastavaAQFCO        0000c5fedffa958ce076c3612d394e22989c2d75c45b28441989d2a5f1c6156d
asrivastavaAXIVC        00004b4496d09703ad412380d426378b0a1bfc2111c06cf5995468bdf6161977
asrivastavaAYMXM        00004eb3dd5305b1460182ccc28a91e872f792b5287959f9274ec31cdd1b2f5b
asrivastavaBDLPP        00000a1a7720bf3a6e0ac3ceae10b825aa1d0d3f6c1866d8a05d04c307bdb3d5
[INFO] [09/18/2014 20:23:17.784] [BitCoinSystem-akka.remote.default-remote-dispatcher-5] [akka.tcp://BitCoinSystem@10.136.50.74:12000/system/remoting-terminator] Shutting down remote daemon.
[INFO] [09/18/2014 20:23:17.785] [BitCoinSystem-akka.remote.default-remote-dispatcher-5] [akka.tcp://BitCoinSystem@10.136.50.74:12000/system/remoting-terminator] Remote daemon shut down; proceedi
lushing remote transports.
[INFO] [09/18/2014 20:23:17.828] [ForkJoinPool-3-worker-7] [Remoting] Remoting shut down
[INFO] [09/18/2014 20:23:17.828] [BitCoinSystem-akka.remote.default-remote-dispatcher-6] [akka.tcp://BitCoinSystem@10.136.50.74:12000/system/remoting-terminator] Remoting shut down.

real    0m5.561s
user    0m18.197s
sys     0m0.451s
Abhinavs-MacBook-Air:src abhinavrungta$
```

We got **12 bit coins** for **block size = 10^4** and **limit = 10^6**
For example we got the following bitcoin:
asrivastavaAYMXM 00004eb3dd5305b1460182ccc28a91e872f792b5287959f9274ec31cdd1b2f5b

2. Size of the work unit that you determined results in best performance for your implementation and an explanation on how you determined it.

We calculated the efficiency of our project by taking different values of number of actors, work unit and limit. The table above shows the results of the computations. We got the **best performance** when we kept the number of **actors to be 10**, **work-unit to be 10^5 and limit to be 10^7.**

3. The coins with the most zeros we got was: **7 zeros**

Abhinavs-MacBook-Air:src abhinavrungta$ time scala Project1 7 100 100000 1000000000

asrivastavaHXUFTC 0000000cbe86e0a1ca76612dc0e5649dd7dc5f686b537c26bd779eb5cacccc19
asrivastavaIAREOP 000000051d47791ae4b2d2b0d54becf26dd9c4c23002aca2e8a5472c7efbecfa
asrivastavaNFOPBY 000000069c3023178ecd18bfc9016281a2cd767f6bb876af2f013192d4786125
asrivastavaATSPWZJ 00000003e15e57b89841271fa9d25d0b26e43c2d54aba7c6ffbb6a807cf49eab
asrivastavaBKIELBT 0000000c90ecee6c463fd2f1034093b6ccc273163c570127d75b4489188adf8b
asrivastavaCCSOBHN 000000095e9811efd9dacb2f76f4b6bc76e9abdae0cf98446d2b2353212407e0

real 48m19.755s
user 168m29.692s
sys 2m13.821s

4. The largest number of working machines you were able to run your code with – 5

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