

PROJECT 1 - COP5615

Submitted by:-
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Run in terminal (for linux)-

- mix deps.get
- mix escript.build
- ./project1 k (k is required number of 0's of bitcoin)
- ./project1 ip_address (ip_address is ip address of server)

1- Size of the work unit :-

We have generated one random string using `random="97504936"<>RandomBytes.base16`, then continued mining by giving the input as the previously hashed value concatenated with the uid to the hashing function in `worker.ex`.

The code utilizes all the cores of the system, which is determined by 'System.schedulers_online' in `project1.ex` file and then those many processes are spawned. So, on my system (4 core machine), all 4 core are running giving CPU usage of 100%.

2- Result of running `./project1 4` :-

sakshis-MacBook-Pro:~\$./project1 4

9750493673fe187f6367b83da9f564e35149d6b970d8b0ed15f68c4b3b53dfddf8b86a77 0000f52a4e238a6f5d11b741ef55f0b3f20f1f57edaa28b2d9e208b17045429a

9750493642b5f71322d1fd34652b87a52618adec3f629e183cb1bfd49d138dd749a61e7c 0000fd2ba0d898cf02d1a01c915b214d4f458ae701eed9af3d54f9a2f1f3505a

97504936a0ad2edd48bc5e4ad64966c9a3c1d152fb27edebc0615fcb0b0530afe8ffea9 000099af3578f7dff738be4d8288ff85a9f5e12c6c43f78db9a439b233c845a0

97504936975562688b6d70818b6924ea98bb6b3d2f0b264a451833c9e3afdcf9883613b2 0000419f07d754247216d7dc28a46a09242985d3d7dee1c26152129092512937

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97504936d9c28577065666690cd758fefe7b30f226fa2c1193ac7e424fa744c2923e9763 00001298f63b53fd94a8ef19f73b6f8b7768da58503835eb136e53108777d640

97504936a12b6967c0eb225b9cf1e5fb9bd3cc51e8770124f30abf90e2f6837df00357d9 00000767736a01fe4f29e5b9a5785fddd6027938d5a4c8e6549b234ffa00482

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97504936f5b3e399dfad86f3fb9fe3eb5eb8ca842f6f25691a67e1eb629f5fee7a362ed6 0000d4c6ca2e377227a37ff7f59e
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771be296e7f623c88859dbfe8fe66d67bcb440e26

```
time ./project1 4
real 0m2.727s
user 0m9.148s
sys 0m0.462s
```

ratio of CPU TIME to REAL TIME is 3.35

3- Running time of ./project1 5 :-

```
time ./project1 5
real 0m30.750s
user 1m44.786s
sys 0m7.283s
```

ratio of CPU TIME to REAL TIME is 3.40

4- Coins mined with most 0's:-

We were able to mine a maximum of 8 leading 0's hashed value.

5- Largest number of machines we ran our code on:-

We managed to work our code on 10 machines - 1 server and 9 workers