

EE 465 Assignment 3

Deep Karman Pal Singh
16D070063

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Exercise 1. Read the selfish mining paper available [here](#) and answer the following questions.

- What does the parameter α represent?
- What does the parameter γ represent?
- What is the difference between the states 0 and 00 in Figure 1?
- Explain the meaning of the three possible transitions from state 00 to 0.
- Explain the meaning of the state transition from 2 to 0.

Solution. We answer the questions as below:

- α is the mining power of the selfish pool.
- γ is the ratio of honest miners that choose to mine on the selfish pool's block.
- State 0 is the state where we only have one public chain, no private chain and no competing chains. State 00 is when we have two competing public chains, the one mined from outside the pool and the one where the pool published its block to match the main branch.
- The first transition of α denotes the case when a miner in our selfish pool finds the next block, which would be published and the pool gets the reward. The transition of $(1 - \alpha)\gamma$ is the case when the next block mined is on the selfish pool's chain but it is mined by a miner not in the pool. The last transition of $(1 - \alpha)(1 - \gamma)$ is when the next mined block is not on the selfish pool's chain, by a miner not in the pool.
- When the pool's private chain is ahead by two blocks (the state 2), the next mined block is by a miner not in the pool with a probability $(1 - \alpha)$. When this happens, the pool publishes its chain (which would be longer by one block and hence "win") so now we go to state 0 and private chain is the same as the public chain.

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Exercise 2. Install metamask extension and send eth on the Ropsten Testnet to a given address.

Solution. [This](#) is the link to the transaction.

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