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A Two Days National Conference on Emerging Trends in Electronic and Instrumentation Engineering (NCETEIE 19)

12th & 13th March 2k19

Organized by

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Block Chain Ledger Manager and Cryptocurrency Miner on a CPU

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ABSRTACT: Blockchain is a technology of distributed, decentralized ledgers and blocks. It is a growing list of records called blocks which are linked together using cryptography. This new technology is hailed as the innovation of the decade after the world wide web. This requires a number of volunteers around the globe connected through the internet to maintain a continuous link of transactions and process that is done through the Blockchain protocol. Maintaining a link requires the volunteer to solve hash functions. Hash functions are encryption algorithms that are focused on Security and Safety. These hash functions do not require high amount of computation. We propose a system for maintaining ledgers and to mine cryptocurrency on a raspberry pi 3 which has a computation constrained ARM V31 chip. Though this chip cannot manage very large calculations, It will be able to solve 64 bit hash functions with ease. This provides us with a cheap alternative for high functioning GPUs thereby providing scalability.

KEYWORDS: Blockchain, Cryptocurrency, Mining

I.INTRODUCTION

Blockchains and cryptoocurrencies have been gaining momentum in the past decade. Due to the increased interest shown in this field, it has become harder and harder to receive benefits of operating a node in the network, Known as mining. This mining process involves solving Exponential hash functions which have becoming more computationally complex and Demanding. This has resulted in a global arms race for more complex Hardwares such as GPUs and ASICS processors are being used to increase the computational ability of the Hardware. This has made small time ambitious miners time difficult and in some cases proven to be impossible to find any monetary compensastion. It almost impossible for everyone to own a Mining grade hardware since They are either constantly off the shelf or Extremely costly to begin with. This puts enthusiast miners in a tricky position that might result in disinterest to invest. Even though it is impossible for people to own such complicated and costly hardware. Almost everyone owns a CPU either in the form of Laptops, Smartphone or Desktops. We have made an analysis on the types of cryptocurrencies available and their viability of mining them in a CPU grade hardware. Among the cryptocurrencies that are available there are a lot of oppurtunities and room for optimisation. The crptocurrencies that we have chosen for this analysis are Bitcoin (BTC), to show the impmossibility of mining in a CPU. Ethereum (ETH), Ripple (XRP) and Monero (XMR). These cryptocurrencies have shown Steady increase in rate and have also shown signs of being relatively easy to mine. We collected data on these system over a peirod of 10 days each to inspect them on the viability of mining.

Bitcoin which started out as a peer to peer cash exchange system has been the beginning of the blockchain Technology and has hence been adopted in many different industries. This has grown by a large amount in the past decade. The Genesis block or the first block of the Bitcoin system was produced by Satoshi nakamato. Whose identity is anonymous to this day. Any attempt on finding him/her has been fruitlesss and have provided to naught. This myster has also provided more complexity to the problem.[1]A completed analysis on the competition over the crptocurrency market. This gives insight given in the overall system and how the complexity has increased exponentially. The competition by large scale investors and their nodes have been providing a deeper insight in the overall system that is given. The competition drives investors to come up with newer solutions such as clustering and using ASICS for processing these systems.[2]Creating a smart contact has been the basic of the whole Blockchain system. This provides a complicated system of peers who entrust in each other to provide validation to a transaction. This smart contract layer

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of the system provides a the protocols Such as SHA 2 and other hashing algorithm to provide with a highly efficient method of mining. The Hash algorithms are exponential and have been getting more complex.[3]
A comprehensive introduction into the cryptocurrency system and hence receives insight and knowledge in the inner workings of the blockchain Technology. This system provides a highly important usage on the market value and how the values tend to fluctutate based on the market demand and hence provide a value increased system. Blockchain system requires a deeper understanding and requires highly complex insights.[4]

II.HARDWARE AND SOFTWARE

The software used to interact with the network is done using Python a open source programming environment that provides a wide variety of libraries to operate on the protocol layer and the operational layer. Python is also simple and extremely easy to code. The Hardware use is a core i7 CPU which provides quite high computation rate than is provided by other mediocre processors. These hardwares were used so that they can provide a considerable output in the timeframe that is provided. But, it is generally assumed that what can be done on these CPU have could actually be used on the other system that is provided. The hardware uses a corsair 775x motherboard. This provides for high transmission rate and an even higher production rate. This Hardware setup was the one that provided the highest value to output ratio.

III. METHODS INTRODUCED

The operations that can be carried out on the CPU needed to be measured overtime and since cryptocurrency mining is a complex system which requires constant usage of the CPU computational capacity. To measure the toil of the CPU and the effect the processes have had on the CPU the Heat of the core is measured. The CPU heat is reliably trusted as the measure of the longevity and consistency of the CPU. CPUs have also been known to undergo thermal throttling. This thermal throttling could affect the performance of the CPU. The CPU core temparature along with the clock speed can be used to measure the CPU performance. The values that are noted in the data collection table are The Max Clockspeed, Max Temperature, Max output, Max hours, Max price on the day the specific value was mined. These values are all measured to find insight on the various crptocurrencies that are available in the Cryptocurrency market. The results obtained on these are highly useful. We were able to mine various cryptocurrency on these systems.

Each Cryptocurrency were mined using the hardware for a period of 10 days the data was collected each day and stored in an XML document. These data were then used to find insight that can found in the system.

IV.RESULTS AND OBSERVATION

The results that we obtained were indicating that there are various other oppurtunities available in the crptocurrency market. This also goes on to prove that there is even room for small scale enthusiasts to find space in the tough Cryptocurrency space. This provides a lot of improvements that can be built on top of the network.

BITCOIN (BTC): The bitcoin system is the most widely used and the most famous of all the available cryptocurrencies in the crptocurrency space. Due to this exceptional attention of the public on Bitcoin, it has become extremelly tough to mine Bitcoin. The graphs given below showthe overall output of the process. As is evident from the Output Graph there was no output in the system, even after we joined in a mining pool. It was impossible to justify our investment on Hardware and electricity. The CPU clockspeed was mased out and the Thermals were off the roof and were almost impossible to justify in the functions. Even after 3 days of continuous operation. It was impossible to mine any considerable amount of bitcoin.

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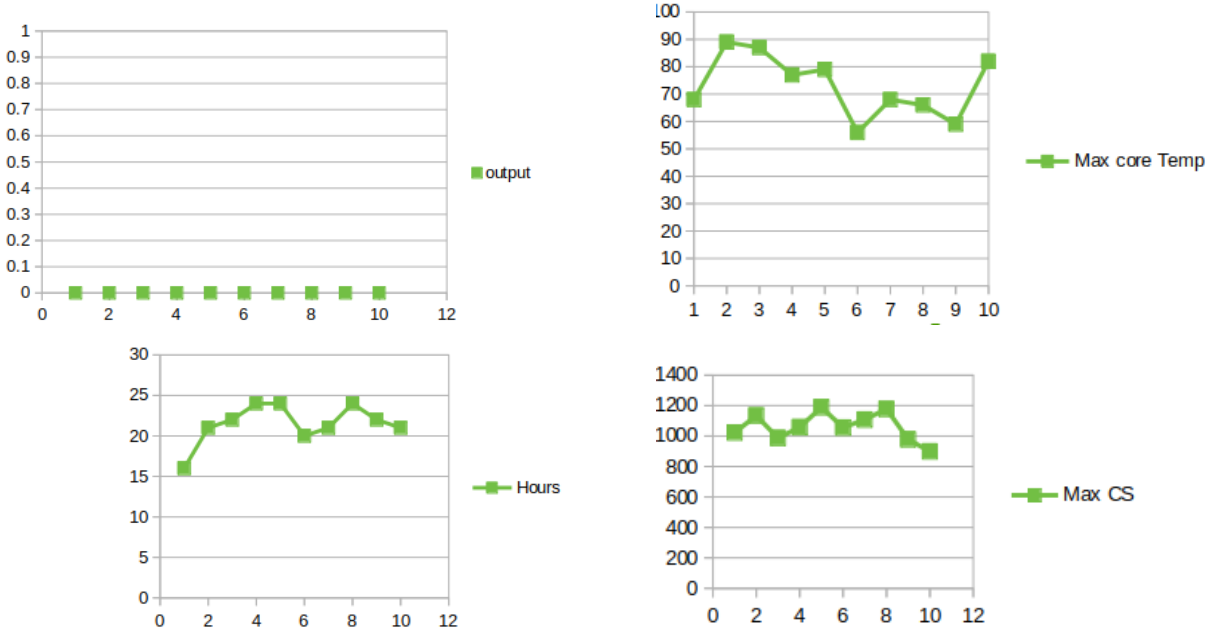
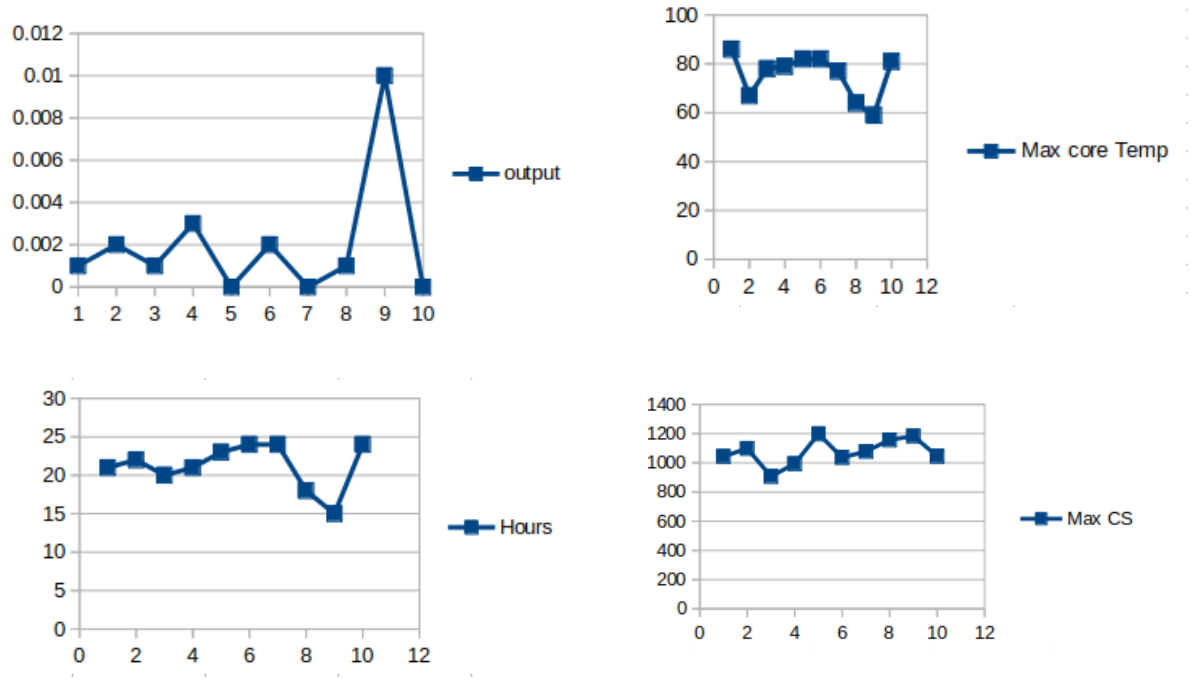


ETHEREUM (ETH): Ethereum is the second best crowd pleaser in the lot. Ethereum systems provide one with a higher system that can be used. Though, it should mentioned that Ethereum provided a better output than Bitcoin. Yet, Ethereum has almost equal Difficulty in mining scores and hence provide a varied range of outputs. The outputs that we received were considerable. But they are so diluted that it is hard to manage a functioning system. The cost is almost equivalent to that of Bitcoin and hence cannot be used as a reliable system. This reliabillity issue on the Ethereum's cost and the Soft and Hard forking causes losses in the system. The output shows that, it'll provide the cost of hardware and electricity only after around 36 months. This makes it an unfit system to mine on a CPU. As a Whole Ethereum, Though higher in outputs than Bitcoin. It doesn't provide the stability that is demanded in the system



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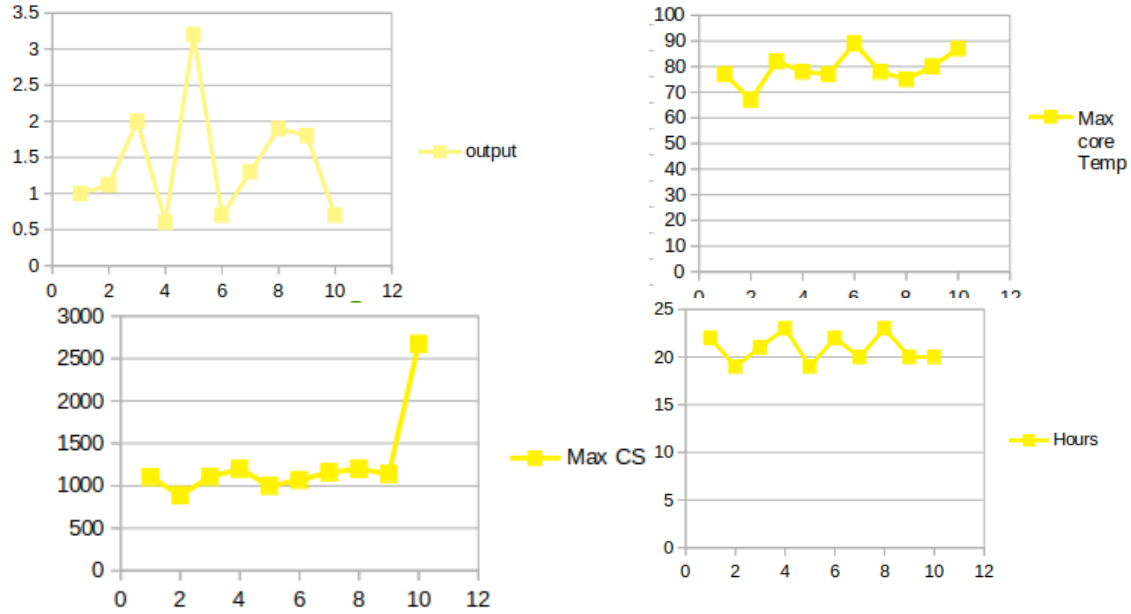
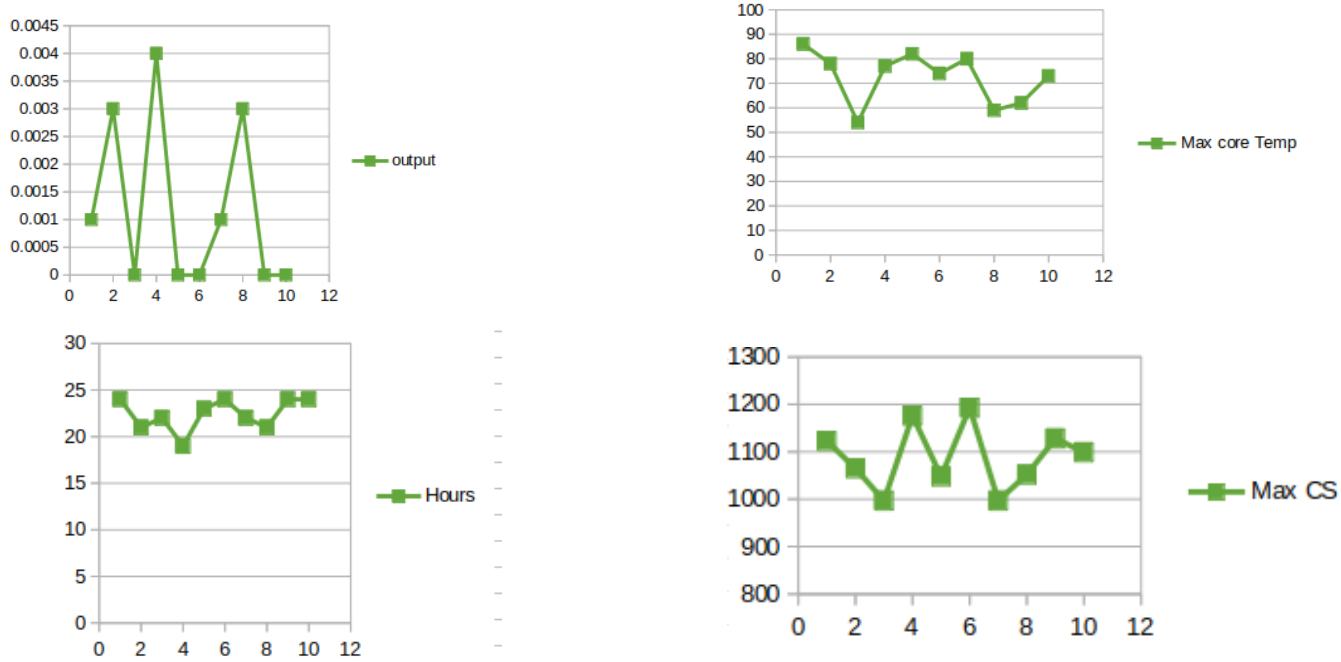
RIPPLE (XRP): Ripple is an open sourced cryptocurrency that provides complete transparence in the operation and in the internal functions. This system provides a higher yield and the best that we have found so far. Ripple system does not have a vast number of audience and has aver smaller value. The functions that can be used in the overall value can be used. Ripple provides the best case value function. Even though the price of ripple is extremely less than compared to that of its cryptocurrency couterparts. Yet the outputs are considerably high. When, the value is adjusted to the price hike in the ripple ecosystem. This provides the highest output to investment ration.



MONERO (XMR): Monero is a new system in the crptocurrency ecosystem. Also the various operations that are usable in the functioning of the value. The problem with monero is that it is in its nascent steps and hence the future of the product cannot be predicted with any degree of certainty. The monero ecosystem is also new and hence can be used to provide for in the functioning of the system. There are several other operations possible. Yet, it is not advisable to invest in this system.



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V.CONCLUSION

From the collected data of the four cryptocurrencies that we selected we were able to find that, Ripple produces the best investment to output ratio, when adjusted for the variation in the market capital and the demand for the product. Monero, though cheap isn't a better alternative as the market value is turbulent. This turbulency results in unpredictable value of the monero system makes it unusable. Whereas Bitcoin, due to its high publicity is inefficient and the difficulty in mining is extremely high that the cost of investment is not justified. Ethereum is second highest in the public awareness and is also difficult to mine albeit being a little easier to mine.

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