**Bitcoin Exercise**

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Objective: Introduce accounting students to bitcoins, hash functions, blockchains, and the accounting issues related to bitcoins.

**Part 1: Watch the following introductory video on bitcoins:**

Bitcoin: How Cryptocurrencies Work (SciShow) (9:24)

https://www.youtube.com/watch?v=kubGCSj5y3k

**Part 2: Definitions**. Define the following terms. Online definitions can be found at sites such as: <http://www.coindesk.com/information/bitcoin-glossary/#n> or <https://bitcoin.org/en/vocabulary>

|  |  |
| --- | --- |
| **TERM** | **DEFINITION** |
| Address |  |
| Block |  |
| Block Reward |  |
| Blockchain |  |
| BTC |  |
| Coinbase |  |
| Coinbase Transaction / Generation Transaction |  |
| Confirmation |  |
| Difficulty |  |
| Double Spending |  |
| Hash |  |
| Input |  |
| Mining |  |
| Mining / Miner |  |
| nBits / Target Threshold |  |
| nonce |  |
| orphan block |  |
| output |  |
| P2P |  |
| Private Key |  |
| Proof of Work |  |
| Public Key |  |
| Satoshis |  |
| SHA-256 |  |
| Transaction Fee / Miner Fee |  |
| wallet |  |

**Part 3: Exploring the Block**

1. What is the current value of 1 bitcoin in USD?
   1. Today’s date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Value: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. What exchange site did you find the valuation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. As of today’s date of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, what is the approximate number of BTC in circulation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. What site did you find this information? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. What would be the market capitalization of bitcoins? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Go to a site such as <http://www.coindesk.com/price/>
   1. What is the 52-week high for BTC in USD? \_\_\_\_\_\_\_\_\_\_\_\_ What date did this occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. What is the 52-week low for BTC in USD? \_\_\_\_\_\_\_\_\_\_\_\_\_ What date did this occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. What site did you find this information? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Go to <http://blockchain.info>. As of today’s date and time of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, what is the height of the bitcoin blockchain? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

For the next 5 questions, select the latest block identified in #4.

1. How many transactions are included in the block? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The **output total** is defined as the total value of all the transaction outputs of the block (including the coins returned to the sender as change). What is the output value of the block?

USD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ BTC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The **estimated transaction volume** is similar to the output total but includes an algorithm which attempts to remove the change from the total value. This may be a more accurate reflection of the true transaction volume. What is the estimated transaction volume for the block?

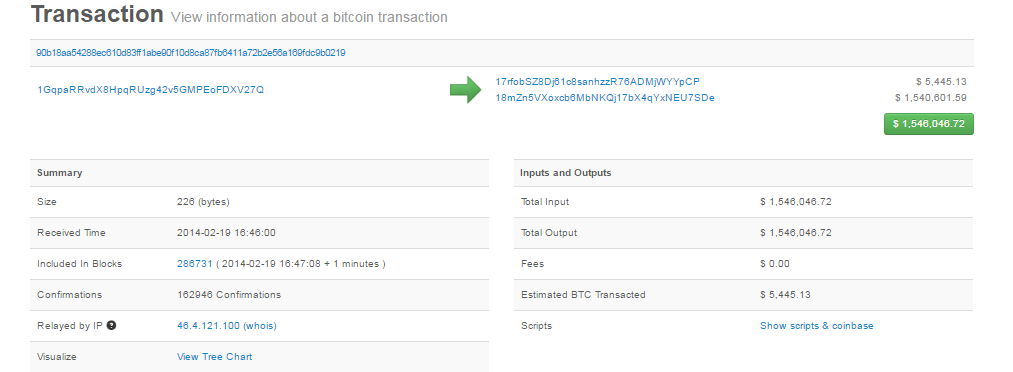
USD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ BTC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the value of the transaction fees? USD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_BTC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the value of the block reward? USD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_BTC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the value of the nonce? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How many leading zeros are in the hash? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 4: Exploring a Transaction**

Transaction ID: 90b18aa54288ec610d83ff1abe90f10d8ca87fb6411a72b2e56a169fdc9b0219

Enter the above transaction id into the search field at blockchain.info. You should see something like below:



What is the date and time of this transaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the input bitcoin address? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the output bitcoin addresses? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the value of the transaction in bitcoins? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What was the value in USD of the transaction at the time of the transaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the value in USD today (at the time you are doing this exercise?) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What block is this associated with? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many confirmations to date? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Click on the INPUT bitcoin address (1GqpaRRvdX8HpqRUzg42v5GMPEoFDXV27Q). This is the bitcoin address from where this transaction originated.

How many transactions are associated with the bitcoin address? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In the table below, identify the Block ID of the below 4 transactions. The first one has been done for you.

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Transaction ID | Amount | Block ID |
| **2014-02-19 16:46:00** | [90b18aa54288ec610d83ff1abe90f10d8ca87fb6411a72b2e56a169fdc9b0219](https://blockchain.info/tx/90b18aa54288ec610d83ff1abe90f10d8ca87fb6411a72b2e56a169fdc9b0219) | -1,684 BTC | [286731](https://blockchain.info/block-index/349103) |
| **2014-02-11 16:26:57** | [18798f8795ded46c3086f48d5bdabe10e1755524b43912320b81ef547b2f939a](https://blockchain.info/tx/18798f8795ded46c3086f48d5bdabe10e1755524b43912320b81ef547b2f939a) | 1,684 BTC |  |
| **2014-02-09 19:17:23** | [f06d3445711d002c484a993cd5ad834e39d23eac94f5a520b698d9d85a608a7](https://blockchain.info/tx/f06d3445711d002c484a993cd5ad834e39d23eac94f5a520b698d9d85a608a7f) | -0.01 BTC |  |
| **2014-02-09 19:17:21** | [1271a07321aa9ecdbf62d3521e0171b8bff02ff016e5f44619813c3c917bbc6b](https://blockchain.info/tx/1271a07321aa9ecdbf62d3521e0171b8bff02ff016e5f44619813c3c917bbc6b) | 0.01 BTC |  |

Go to blockchain.info

Let’s examine the first transaction associated with this address. This will be the LAST one on the list if it is sorted from new to old, which is the default. The transaction ID we are examining starts with “1271…” Select the transaction.

Take a screen shot of transaction id “1271”. It should look like this. Replace the screenshot in the template with your screenshot.

|  |
| --- |
|  |

What is the transaction date for the above transaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

For transction “1271…”, there are two input addresses associated with the transaction. What are the two input addresses and values? The first one has been completed for you.

|  |
| --- |
| INPUT BITCOIN WALLET ADDRESSES |
| 1HK7sQTqJdjBbX5VyEqfe6m8b85NvYZdWw |
|  |

For that same transaction (“1271…”), what are the two output addresses and **values** associated with the transaction? The first output address and values are listed for you.

|  |  |  |
| --- | --- | --- |
| OUTPUT BITCOIN WALLET ADDRESSES | Value in Bitcoins at the time of transaction | Value in USD at the time of the transaction |
| 1GqpaRRvdX8HpqRUzg42v5GMPEoFDXV27Q | 0.01 BTC | $6.98 |
|  |  |  |

For transaction “1271…”, was the address “1Gqpa…” the sender or the receiver? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What block number was this transaction included in? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many confirmations does this transaction have? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Click “visualize” to view the tree chart

Insert a screenshot of the visualization here. Replace the one in this template with your screenshot.

|  |
| --- |
|  |
|  |

Click on the orange button associated with transaction 1Gqpa …

What is the IP address associated with transaction “1Gqpa…”? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What country is associated with the above IP address? Hint: go to google and lookup the IP address details. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Enter the address of “1Gqpa…” into the search field of blockchain.info. Does the bitcoin address of “1Gqpa…” have any bitcoins associated with it now? (YES or NO) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 5: Hashing and Additional Research**

**Step 1:** Watch this short (simplistic) video on the difference between hashing and encryption

<https://www.youtube.com/watch?v=EJ-fnN28FRI> (1:40)

**Step 2**: Watch this short explanation on the bitcoin hashing and SHA-256

<https://www.youtube.com/watch?annotation_id=annotation_3457876853&feature=iv&src_vid=9mNgeTA13Gc&v=jzro6im0S6o>

Now, we are going to divide the class into 6 different groups through hashing.

**Step 3**: Find your group. Hash your name into an SHA-256 hash value.

* Go to a site with a hash calculator such as <http://conversion-tool.com/sha256>
* Hash your first name and last name
* Document the input and output hash result in the table below
* Going from left to right, visually search for the first instance of a digit between 1-6. That will be your group number.
* Therefore in the example below, the group for “Lorraine Lee” is “5”
* Fill in your name, hash, and group number in the table below.

|  |  |  |
| --- | --- | --- |
| **INPUT (Text to hash)** | **OUTPUT (Hash Result)** | **Group** |
| Lorraine Lee | 9f56bad70b62f68add9e1e6fb675388b0baa37d947d0f90a7b47eced1dcb4306 | 5 |
| Cassie Kohler | 9aab14e7980cb6a0c3aa48a3939845ad6a4dad04c6db3969ba73f3af25301b94 | 1 |
| YOUR NAME |  |  |

**Step 4**: Go to the appropriate Blackboard Discussion Group. Prepare a short answer response to the prompt. Your response should be 200 – 500 words. Your response ideally should add to the discussion and not simply repeat the information previously posted. Provide the URL of any sites or documents used to answer the question.

1. Group 1: What does the IRS think about bitcoins? What are the tax implications of bitcoins?

1. Group 2: What does a business have to consider if they accept bitcoins? Focus on both accounting and non-accounting implications.
2. Group 3: What does an individual have to consider if he/she trades with bitcoins? Focus on accounting and non-accounting implications.
3. Group 4: What are the legal issues related to bitcoins? What laws may be impacted by bitcoins?
4. Group 5: Do you think bitcoin or another cyber currency will replace existing traditional currency? Why or why not?
5. Group 6: What happened regarding the failed MT GOX bitcoin exchange? Do you think this will happen again?