**INHA UNIVERSITY TASHKENT**

**DEPARTMENT OF CSE & ICE**

**FALL SEMESTER 2022**

**NTS4090 - BLOCKCHAIN BASICS & PLATFORMS**

**HOME ASSIGNMENT1/**

**TERM PROJECT 1**

**Submitted by**

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**Yangiboev Komiljon U1910221 001**

**Group : SENIOR TEAM 24**

**INSTRUCTIONS :**

* **ALL HOME ASSIGNMENTS/TERMPROJECTS ARE TO BE COMPLETED IN GROUPS OF 4 TO 8 MEMBERS**
* **SCREEN SHOTS ARE TO BE PROVIDED FOR ALL THE QUESTIONS**
* **HOME ASSIGNMENT/TERM PROJECT REPORT SHOULD BE PREPARED USING THE TEMPLATE PROVIDED**
* **EVERY MEMBER OF THE TEAM MUST UPLOAD THE SOFTCOPY OF THE REPORT AT THE ECLASS PORTAL**
* **LAST DATE FOR SUBMISSION OF THE HOME ASSIGNMENT IS FRIDAY 30th SEPTEMBER 2022**
* **LATE SUBMISSIONS ARE NOT ENTERTAINED, ADHERE TO THE DEADLINE STRICTLY**
* **READ THE QUESTIONS CORRECTLY & CAREFULLY**

**PART - A**

**HOME ASSIGNMENT 1**

**QUESTION 1**

**Analyze BITCOIN BLOCKCHAIN structure by taking at least SIX x N recently added blocks from the bitcoin blockchain by visiting the website: ww.blockchain.com/btc/blocks.**

**[A] PROVIDE THE VALUES IN THE FOLLOWING FIELDS IN THESE SIX x N BLOCKS USING THE FOLLOWING FORMAT:**

**BLOCK # …………………….**

**(i) Hash (Block Hash)**

**(ii) Confirmations**

**(iii) Timestamp**

**(iv) Height**

**(v) Miner**

**(vi) Number of transactions**

**(vii) Difficulty**

**(viii) Merkle root**

**(ix) Version**

**(x) Bits**

**(xi) Weight**

(xii) Size

**(xiii) Nonce**

**(xiv) Transaction volume**

**(xv) Block Reward**

**(xvi) Fee Reward**

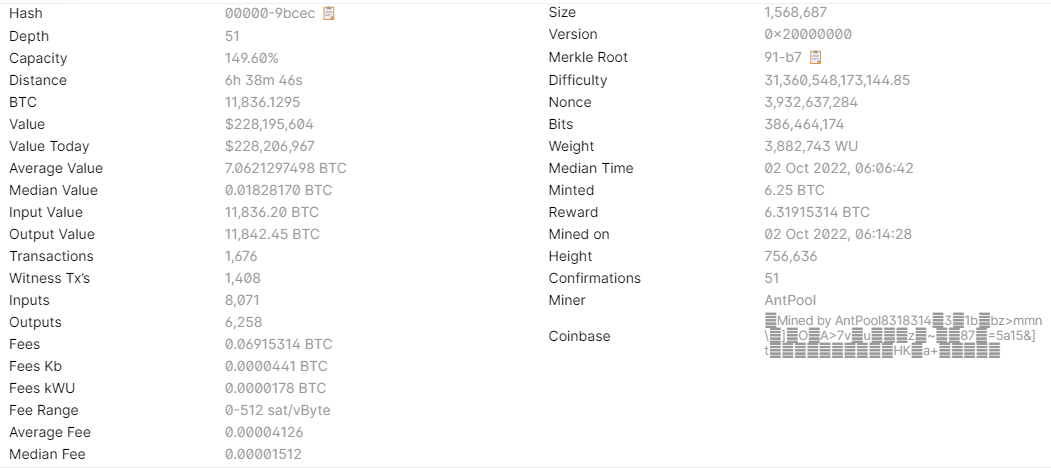
**(xvii) Describe clearly the details of a single transaction in this**

**block of Bitcoin Blockchain.**

**[B] INCLUDE THE SCREENSHOTS OF ALL THE BLOCKS SHOWING CLEARLY ALL THE FIELDS**

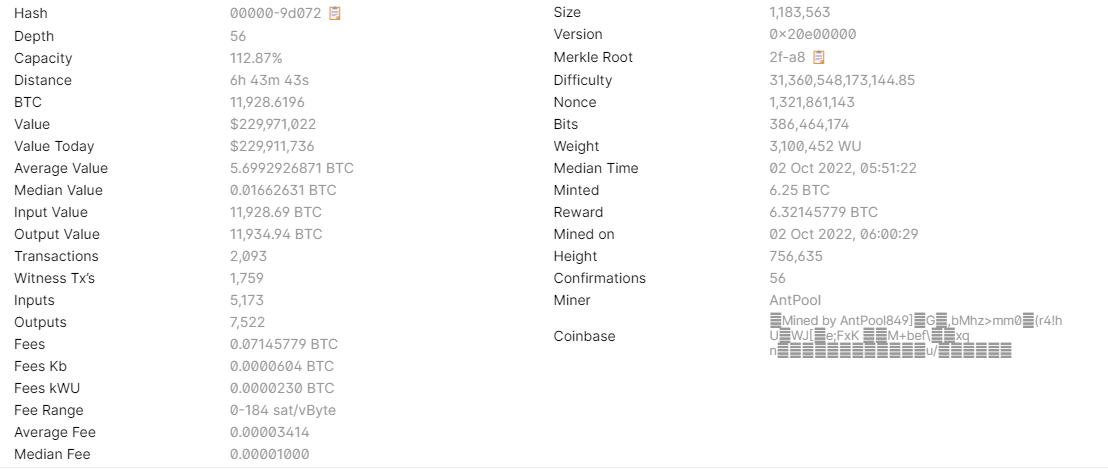
**Block #756,636**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 0000000000000000000204540a2282694c658a6453dade49abed2b3992f9bcec |
| **(ii)** | **Confirmations** | 51 |
| **(iii)** | **Timestamp** | 02 Oct 2022, 06:06:42 |
| **(iv)** | **Height** | 756,636 |
| **(v)** | **Miner x** | AntPool |
| **(vi)** | **Number of transactions** | 1,676 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 91a551044638fb403b8e88c0a6902c27f8c72020dbd89ab2983737db5aac00b7 |
| **(ix)** | **Version** | 0x20000000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 3,882,743 WU |
| **(xii)** | **Size** | 1,568,687 bytes |
| **(xiii)** | **Nonce** | 3,932,637,284 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.31915314 BTC |
| **(xvi)** | **Fee Reward** | 0.06915314 BTC |



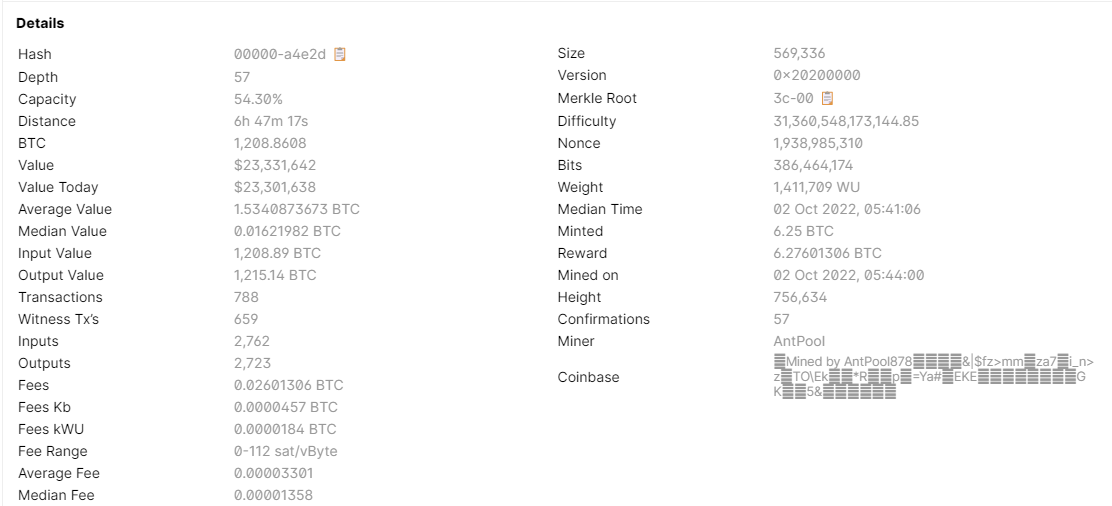
**Block #756,635**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000002c41d6540d2b3c63411bb78fb7f7c28a7b15f1909d072 |
| **(ii)** | **Confirmations** | 56 |
| **(iii)** | **Timestamp** | 10/02/2022, 06:00:29 |
| **(iv)** | **Height** | 756,635 |
| **(v)** | **Miner x** | AntPool |
| **(vi)** | **Number of transactions** | 2,093 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 2f91141a3436bc628fce8f1f3b6a7ff51dbf66913ddfd04ec28129eaaeaa43a8 |
| **(ix)** | **Version** | 0x20e00000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 3,100,452 WU |
| **(xii)** | **Size** | 1,183,563 bytes |
| **(xiii)** | **Nonce** | 1,321,861,143 |
| **(xiv)** | **Transaction volume** | 11,928.69 BTC |
| **(xv)** | **Block Reward** | 6.32145779 BTC |
| **(xvi)** | **Fee Reward** | 0.07145779 BTC |



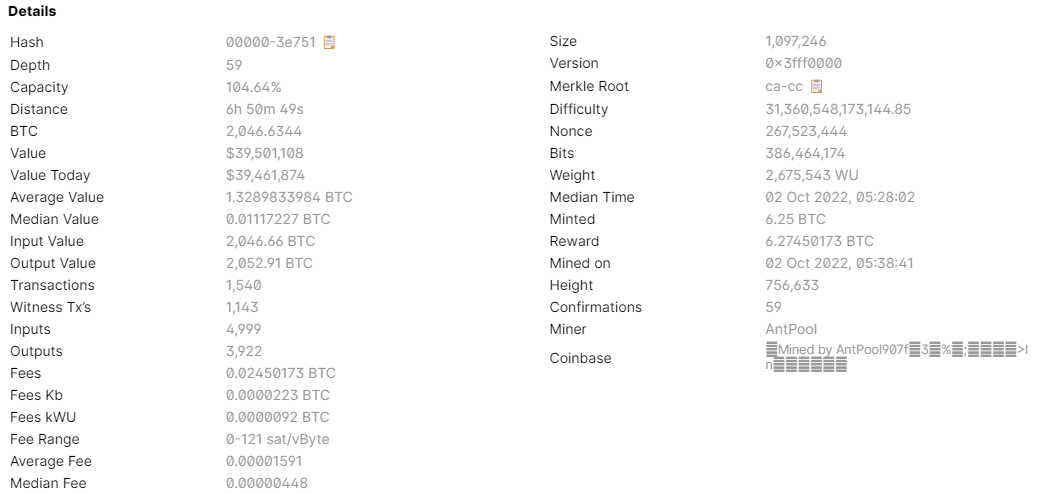
**Block #756,634**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000002541a14f691e4a2807f8e9c20e4aad4a0a737190a4e2d |
| **(ii)** | **Confirmations** | 57 |
| **(iii)** | **Timestamp** | 10/02/2022, 05:44:00 |
| **(iv)** | **Height** | 756,634 |
| **(v)** | **Miner x** | AntPool |
| **(vi)** | **Number of transactions** | 788 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 3c235dd083adae7da010d49bc978fef189883001add380612e6438192bcbb000 |
| **(ix)** | **Version** | 0x20200000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 1,411,709 WU |
| **(xii)** | **Size** | 569,336 bytes |
| **(xiii)** | **Nonce** | 1,938,985,310 |
| **(xiv)** | **Transaction volume** | 1,208.89 BTC |
| **(xv)** | **Block Reward** | 6.27601306 BTC |
| **(xvi)** | **Fee Reward** | 0.02601306 BTC |



**Block #756,633**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 000000000000000000023c76cc7cbee726cf56d7982336512fdb626b3483e751 |
| **(ii)** | **Confirmations** | 59 |
| **(iii)** | **Timestamp** | 10/02/2022, 05:38:41 |
| **(iv)** | **Height** | 756,633 |
| **(v)** | **Miner x** | AntPool |
| **(vi)** | **Number of transactions** | 1,540 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | ca91c896c3e3b8a26a25ef105012d4f974f8c38cf339b379eaaaaebf4cee44cc |
| **(ix)** | **Version** | 0x3fff0000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 2,675,543 WU |
| **(xii)** | **Size** | 1,097,246 bytes |
| **(xiii)** | **Nonce** | 267,523,444 |
| **(xiv)** | **Transaction volume** | 2,046.66 BTC |
| **(xv)** | **Block Reward** | 6.27450173 BTC |
| **(xvi)** | **Fee Reward** | 0.02450173 BTC |



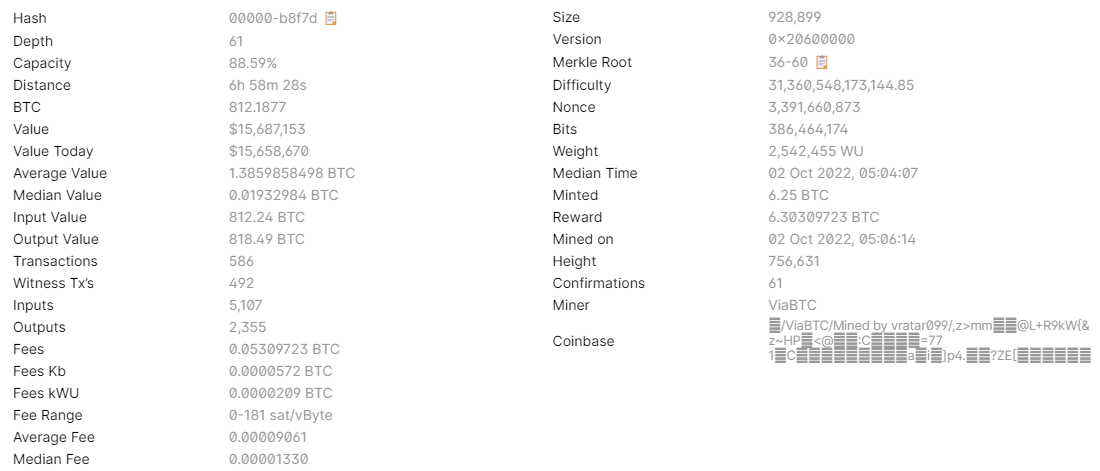
**Block #756,632**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000006c9cc854fbb4b8dcd51f33474399fce4d8ec6e5301651 |
| **(ii)** | **Confirmations** | 60 |
| **(iii)** | **Timestamp** | 10/02/2022, 05:34:33 |
| **(iv)** | **Height** | 756,632 |
| **(v)** | **Miner x** | AntPool |
| **(vi)** | **Number of transactions** | 2,790 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 96881f6265e47e2af7860234bb572ca216da2643083b4d53d97f4d8799629488 |
| **(ix)** | **Version** | 0x200da000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 3,993,614 WU |
| **(xii)** | **Size** | 1,428,521 bytes |
| **(xiii)** | **Nonce** | 2,790,725,981 |
| **(xiv)** | **Transaction volume** | 26,660.79 BTC |
| **(xv)** | **Block Reward** | 6.37949546 BTC |
| **(xvi)** | **Fee Reward** | 0.12949546 BTC |



**Block #756,631**

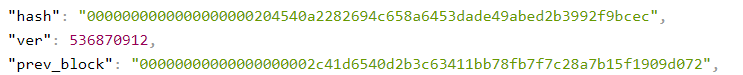
|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 0000000000000000000457218faf1677ba52120aa4eb8accb600be99113b8f7d |
| **(ii)** | **Confirmations** | 61 |
| **(iii)** | **Timestamp** | 10/02/2022, 05:06:14 |
| **(iv)** | **Height** | 756,631 |
| **(v)** | **Miner x** | ViaBTC |
| **(vi)** | **Number of transactions** | 586 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 36cd3f5f14ca136fcf191199862d139b7c7006ded6a3d0010057bc53f1d31360 |
| **(ix)** | **Version** | 0x20600000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 2,542,455 WU |
| **(xii)** | **Size** | 928,899 bytes |
| **(xiii)** | **Nonce** | 3,391,660,873 |
| **(xiv)** | **Transaction volume** | 812.24 BTC |
| **(xv)** | **Block Reward** | 6.30309723 BTC |
| **(xvi)** | **Fee Reward** | 0.05309723 BTC |



**[C] DRAW THE BLOCKCHAIN SHOWING HOW THESE BLOCKS ARE CHAINED BY PROVIDING ONLY THE REQUIRED FIELD INFORMATIONS IN THESE BLOCKS.**

In order to show how block chained together we used [Blockchain Data API](https://www.blockchain.com/api/blockchain_api). As you can see, hash of old block is same as prev\_block indicated in the response of new block.

**BLOCK #756,636**

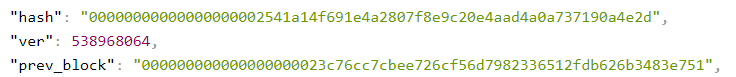


**BLOCK #756,635**

Text

Description automatically generated with medium confidence

**BLOCK #756,634**

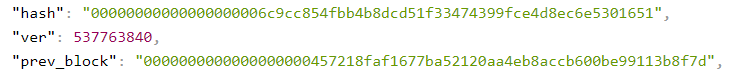


**BLOCK #756,633**

A picture containing text

Description automatically generated

**BLOCK #756,632**



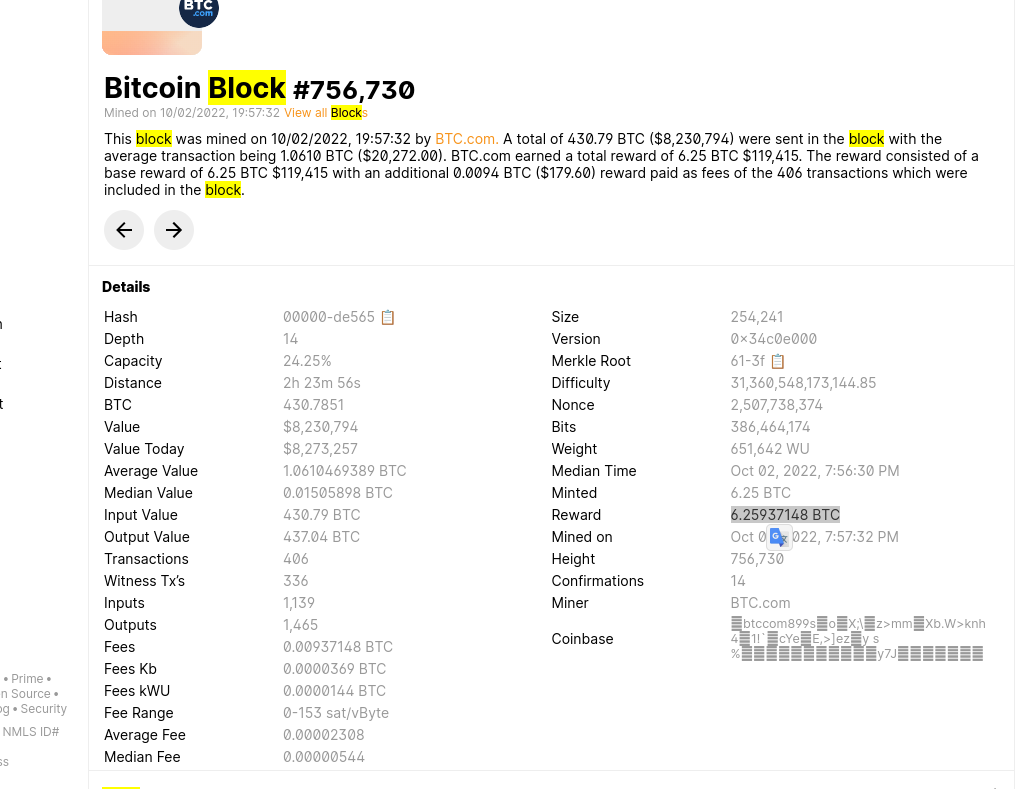
**BLOCK #756,631**

Text

Description automatically generated with medium confidence

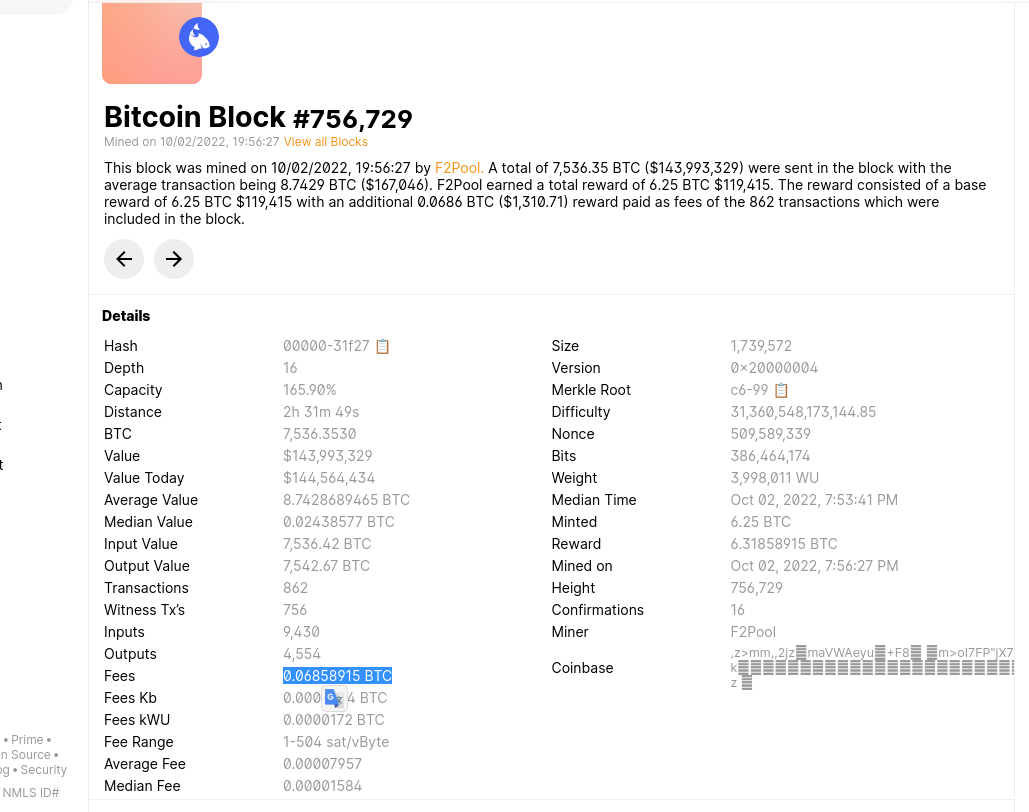
**Block #756,630**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000008457eb76f0afaf172f8872cf4143f18f2322c62bde565 |
| **(ii)** | **Confirmations** | 14 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:56:30 PM |
| **(iv)** | **Height** | 756,730 |
| **(v)** | **Miner x** | BTC.com |
| **(vi)** | **Number of transactions** | 406 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 6141b7a6aef2cca10dc3cd98c76d0aabb65259eddba9f7842ae251fad4e9dd3f |
| **(ix)** | **Version** | 0x34c0e000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 651,642 WU |
| **(xii)** | **Size** | 254,241 |
| **(xiii)** | **Nonce** | 2,507,738,374 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.25937148 BTC |
| **(xvi)** | **Fee Reward** | 0.00937148 BTC |



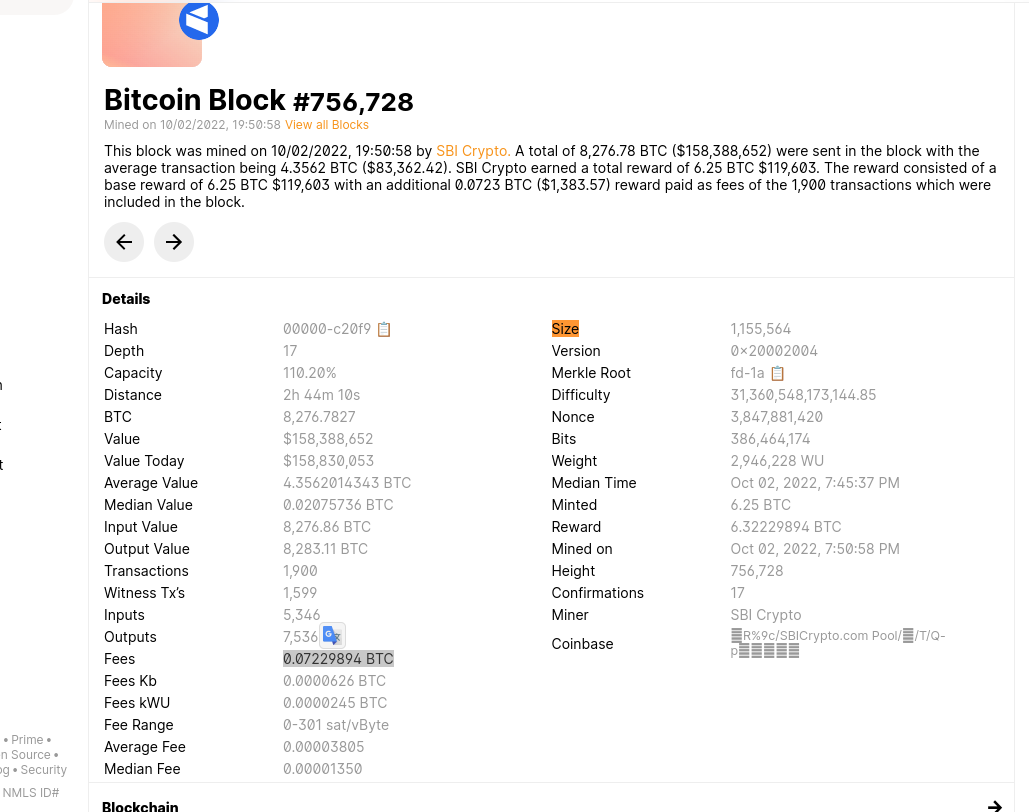
**Block #756,629**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000007ad9d56a2b0b3c2d5f97dc59436ea289fbdf00a331f27 |
| **(ii)** | **Confirmations** | 16 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:53:41 PM |
| **(iv)** | **Height** | 756,729 |
| **(v)** | **Miner x** | F2Pool |
| **(vi)** | **Number of transactions** | 862 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | c6533717ceea9fa2e44b9a698aad8543d968e547c7e847bab257462d0ccac299 |
| **(ix)** | **Version** | 0x20000004 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 3,998,011 WU |
| **(xii)** | **Size** | 1,739,572 |
| **(xiii)** | **Nonce** | 509,589,339 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.31858915 BTC |
| **(xvi)** | **Fee Reward** | 0.06858915 BTC |



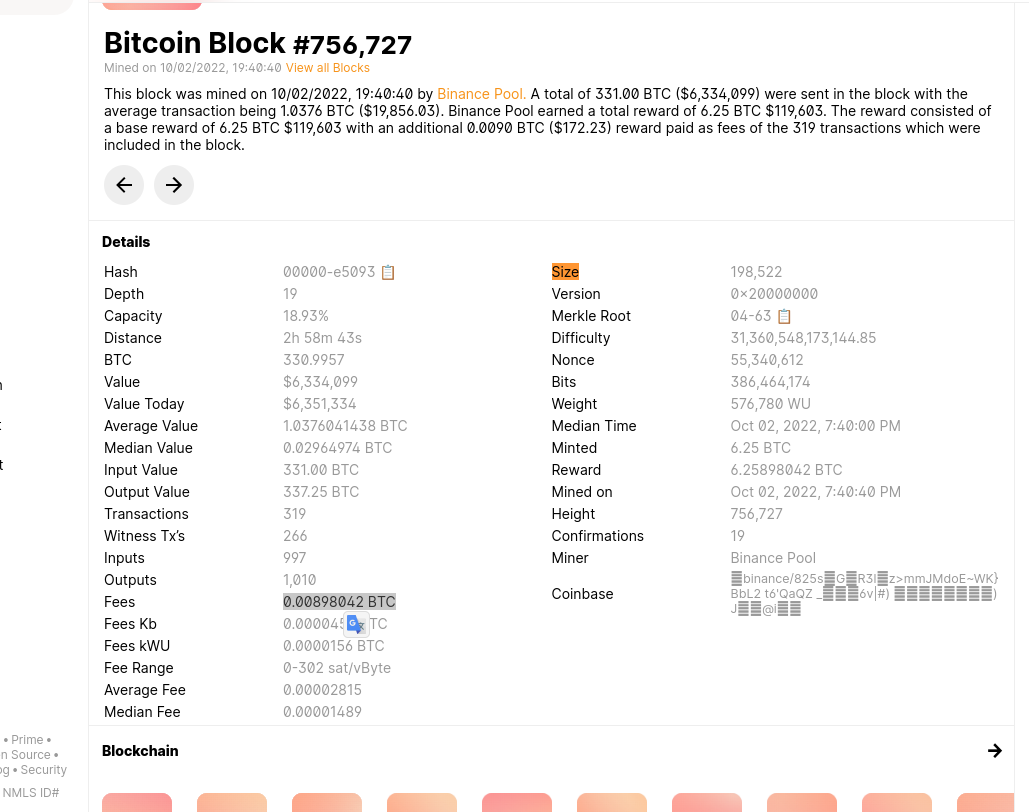
**Block #756,628**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 000000000000000000054bb658fe586a0694d6929f30d8587a9e042402bc20f9 |
| **(ii)** | **Confirmations** | 17 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:45:37 PM |
| **(iv)** | **Height** | 756,728 |
| **(v)** | **Miner x** | SBI Crypto |
| **(vi)** | **Number of transactions** | 1,900 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | fdcd41e48574b3de0f3ac6d3f4195f8eb9f5adc66b2f8e2e3c861ff4025ddf1a |
| **(ix)** | **Version** | 0x20002004 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 2,946,228 WU |
| **(xii)** | **Size** | 1,155,564 |
| **(xiii)** | **Nonce** | 3,847,881,420 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.32229894 BTC |
| **(xvi)** | **Fee Reward** | 0.07229894 BTC |



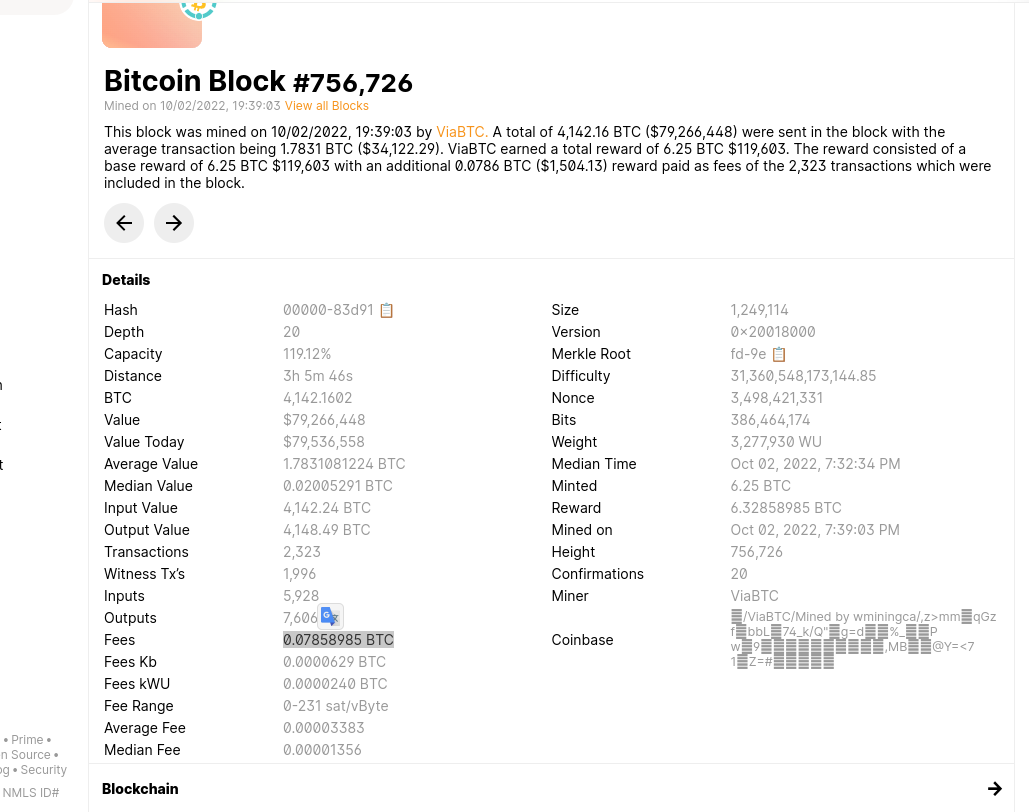
**Block #756,627**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 000000000000000000056d41515ed955420cc81e8db16235f4964afebb8e5093 |
| **(ii)** | **Confirmations** | 19 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:40:40 PM |
| **(iv)** | **Height** | 756,727 |
| **(v)** | **Miner x** | Binance Pool |
| **(vi)** | **Number of transactions** | 319 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | 04765887444fbf5a705dc2c4894fba1960445869fae4980a17ad33bb52a02863 |
| **(ix)** | **Version** | 0x20000000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 2,946,228 WU |
| **(xii)** | **Size** | 198,522 |
| **(xiii)** | **Nonce** | 55,340,612 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.25898042 BTC |
| **(xvi)** | **Fee Reward** | 0.00898042 BTC |



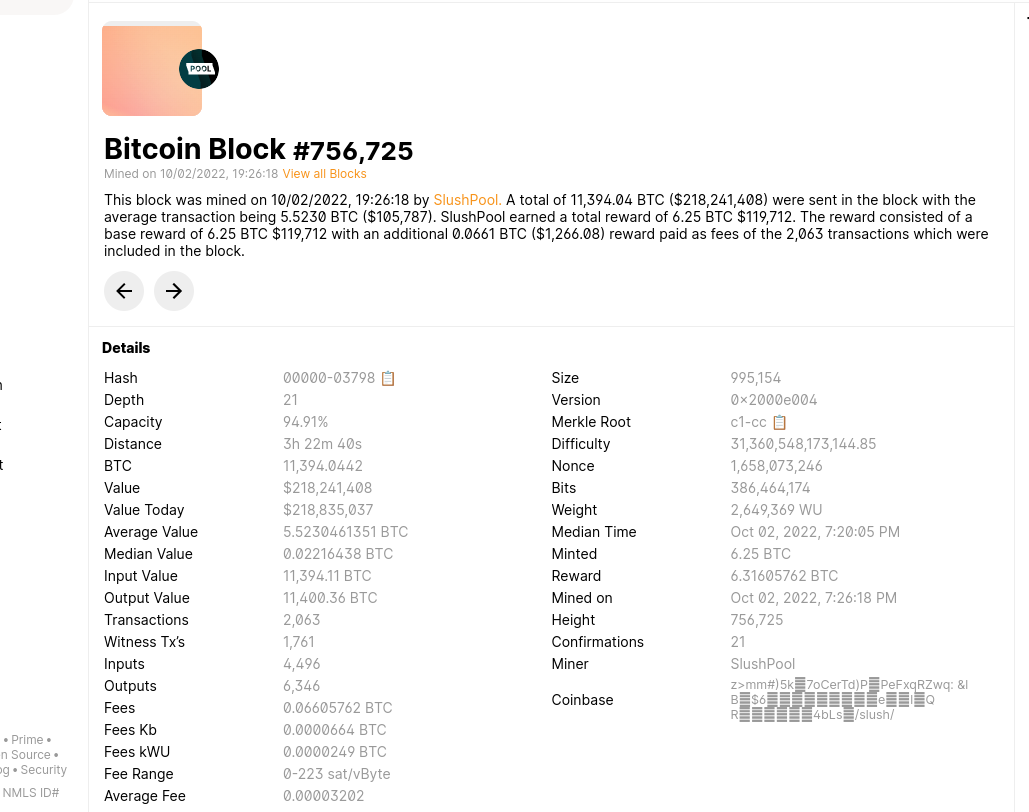
**Block #756,626**

|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 000000000000000000052dfc0a69b312c48061fbeb061e554a14936b28c83d91 |
| **(ii)** | **Confirmations** | 20 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:39:03 PM |
| **(iv)** | **Height** | 756,726 |
| **(v)** | **Miner x** | ViaBTC |
| **(vi)** | **Number of transactions** | 2,323 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | fdcaec871add7a3bda483b91617109f504aed00a33d79487972fc5a12050df9e |
| **(ix)** | **Version** | 0x20018000 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 3,277,930 WU |
| **(xii)** | **Size** | 1,249,114 |
| **(xiii)** | **Nonce** | 3,498,421,331 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.32858985 BTC |
| **(xvi)** | **Fee Reward** | 0.07858985 BTC |



**Block #756,625**

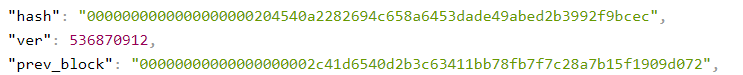
|  |  |  |
| --- | --- | --- |
| **(i)** | **Hash(Block Hash)** | 00000000000000000007a5edbfcc949fd7c3707dd9c35e6d005765fe29e03798 |
| **(ii)** | **Confirmations** | 21 |
| **(iii)** | **Timestamp** | Oct 02, 2022, 7:26:18 PM |
| **(iv)** | **Height** | 756,725 |
| **(v)** | **Miner x** | SlushPool |
| **(vi)** | **Number of transactions** | 2,063 |
| **(vii)** | **Difficulty** | 31,360,548,173,144.85 |
| **(viii)** | **Merkle root** | c1ce9b7800db24c355670ae0cac46a4f77d61f25d3f7180e84afc852359bf4cc |
| **(ix)** | **Version** | 0x2000e004 |
| **(x)** | **Bits** | 386,464,174 |
| **(xi)** | **Weight** | 2,649,369 WU |
| **(xii)** | **Size** | 995,154 |
| **(xiii)** | **Nonce** | 1,658,073,246 |
| **(xiv)** | **Transaction volume** | 11,836.20 BTC |
| **(xv)** | **Block Reward** | 6.31605762 BTC |
| **(xvi)** | **Fee Reward** | 0.06605762 BTC |



**[C] DRAW THE BLOCKCHAIN SHOWING HOW THESE BLOCKS ARE CHAINED BY PROVIDING ONLY THE REQUIRED FIELD INFORMATIONS IN THESE BLOCKS.**

In order to show how block chained together we used [Blockchain Data API](https://www.blockchain.com/api/blockchain_api). As you can see, hash of old block is same as prev\_block indicated in the response of new block.

**BLOCK #756,630**

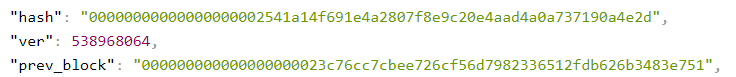


**BLOCK #756,629**

Text

Description automatically generated with medium confidence

**BLOCK #756,628**

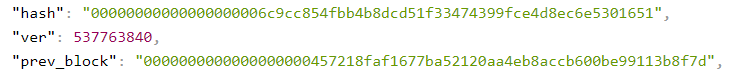


**BLOCK #756,627**

A picture containing text

Description automatically generated

**BLOCK #756,626**



**BLOCK #756,625**

Text

Description automatically generated with medium confidence