Methodology explained: Why we need a Spot Price Index Series?

31 March 2022

IX Crypto index ("IXCI") is one of the first few indexes in the world which represents the total crypto market. It is Hong Kong's first benchmark crypto index. Launched on 12 December 2018 with a base price of 1,000 on base date 3 December 2018, the IXCI is a free float-adjusted market capitalisation weighted index with a 40% cap on the weighting of individual constituent cryptocurrency. It aims at covering 80% of the total market capitaisation of the crypto markets with the biggest and most liquid coins as its constituents. The index has grown from 7 coin constituents to currently 11 (as at 28 March 2022). IXCI has reached over 16 times at its peak and has been consistently outperformed Bitcoin since May 2021, while serving a function of risk diverfication and benchmarking purposes (Please refer chart in Appendix 1). The IXCI is calculated by the IX Asia Indexes Company Limited and established on day one with a high level of governance and integrity.

To learn more about our story of the ixCrypto Index, please refer to about us at the end of the document.

Fast Development of the Crypto and Digital Assets markets

We see the potential and the need

Since the launch of the first crypto index in 9 December 2018, IX Asia Indexes Company ("IXAI") sees the total number of cryptocurrencies increased from 2000+ to 18,516 as of 28 March 2022 (more than 9 times in less than 3.5 years).Total crypto market cap during the month of Decemeber 2018 when we first launched our ixCrypto Index varied between US$103-141 bn with Bitcoin prices hovered around US$3200-4200 level. 2021 had been a remarkable year for cryptocurrency market which surpassed US$3 tn in value in November on the back of more institutions investment and news such as El Salvador adopting Bitcoin as legal tender. Bitcoin prices reached

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an all-time high in 2021, as values exceeded over US$60,000 in April and November 2021. Prices spiked up by the news of Coinbase listing and the launch of a Bitcoin ETF in the United States. More Bitcoin and Ethereum micro futures and options came into market, reflecting substantial demand from institution investors on hedging purposes.

The Securities and Exchange Commission in the US so far had approved three futures-based Bitcoin ETFs and more applications are pending for approval. By opening up the doors to mainstream investors through Bitcoin ETFs, numerous investors can indirectly invest into Bitcoin but without actually holding the digital asset itself.

With over 300 crypto spot exchanges in the world and more product issuance on cryptocurrencies, we see the urge of good investment vehicles available to fund managers and investors to help gauging the performance of whole crypto world with the fairest price. This is particularly important for product issuers for mark to market purpose with a substantial need to reflect a true and fair valuation of their crypto portfolio to their investors.

Who We Are

We bring reliability, transparency and standardization to indexes

IX Asia Indexes Company Limited (“IX Asia Indexes”) is responsible for all aspects of the Benchmark Administration including the development of the Benchmark and the Benchmark Methodology. IX Asia Indexes is committed to bring transparency to the market which is critical for the financial market to function in an open and orderly manner. The benchmark methodology focuses on systematic and rules-based approach to properly reflect the underlying market. IX Asia Indexes is responsible for the ongoing operation of the Benchmark Administration process, including taking appropriate contingency measures in the event of unavailability of inputs, market disruption or failure of critical infrastructure.

Governance

Index Advisory Committee

IX Asia Indexes Advisory Committee serves as an advisory group to provide oversight and governance for the benchmark administration of IX Asia indexes. Their role is to review and comment the data sources, methodologies, and operation of IX Asia Indexes and provide guidance to the future development of new indices by their

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professional knowledge and experience. The Index Advisory Committee has representation from different industries including fund management, exchanges, brokerage, financial blockchain expert and crypto service providers etc.

How we calculate our fixing price

Fairness and Representative

Cryptocurrency prices are calculated using the average of latest available trading prices from selected well representable exchanges (at least 8) based on their total average turnover and exchange background. We perform crypto exchanges and pairs study review every quarter based on their total trading volume.

Why do we use simple average?

Avoid temporary price fluctuations

By using simple average instead of weighted average, trades of large size or clusters of trades on one or a few of the constituent exchanges within a short period of time, which are more likely to cause temporary price fluctuations, would not have undue influence on the index level. By applying equal weight to the constituent exchanges with simple average, potential manipulators cannot target one platform for manipulative trades. We may look into volume weighted or other methodologies when such treatment would provide a fairer index as the market further matures and at which time we may also include additional procedures to cater for the aforementioned scenarios.

Methodology behind the spot price index

Good representation of the crypto market

Designed to be easy to understand while providing a good representation of the crypto market, ixCrypto index aims to cover the 80% of the cumulative free-float adjusted market capitalization in the crypto universe and, at the same time, the crypto currencies should be among the top 25* ranking by trading volume in the 90 days preceding the review date. The index is reviewed quarterly and with a fast entry rule. Furthermore, to ensure the professionality and impartiality of the index methodologies and operations, IX Asia Indexes has established its index advisory committee with representation from different industries, including fund management, exchanges, brokerage, financial

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blockchain experts, crypto service providers, etc. The committee meets at least quarterly a year to discuss matters relating to the IX Asia Indexes, including to review and to comment the data sources, methodologies, and operations of IX Asia Indexes, to provide guidance to the future development of new IX Asia Indexes and to handle other issues and decisions on an as-needed basis.

Usage of the spot price index

One price for one cryptocurrency

The Spot Price Index series provides a single price for the market at every 5 second interval real-time, USD-equivalent spot rate for the most representable coins in the world. The spot price index can be used by fund managers, financial institutions, crypto exchanges etc, as a fair benchmark as well as serve as settlement price of their crypto products.

How we get our own data source around the world

Ensure data reliability with resilient sound infrastructure

Our data collection system runs with 4 instances with each collecting cryptocurrency price data from at least 8 cryptocurrency exchanges. With 4 seconds interval of API and 4 instances, we can achieve price data collection every second. Even when there is downtime in either region Hong Kong/Singapore in AWS, we can still achieve half data rate i.e. collecting price data every 2 seconds. Our database use Amazon RDS Multi-AZ deployment with Read Replica to achieve high availability and durability, failovers automatically and easily backup. Our API servers connect to Read Replica of database to provide fast and stable API service.

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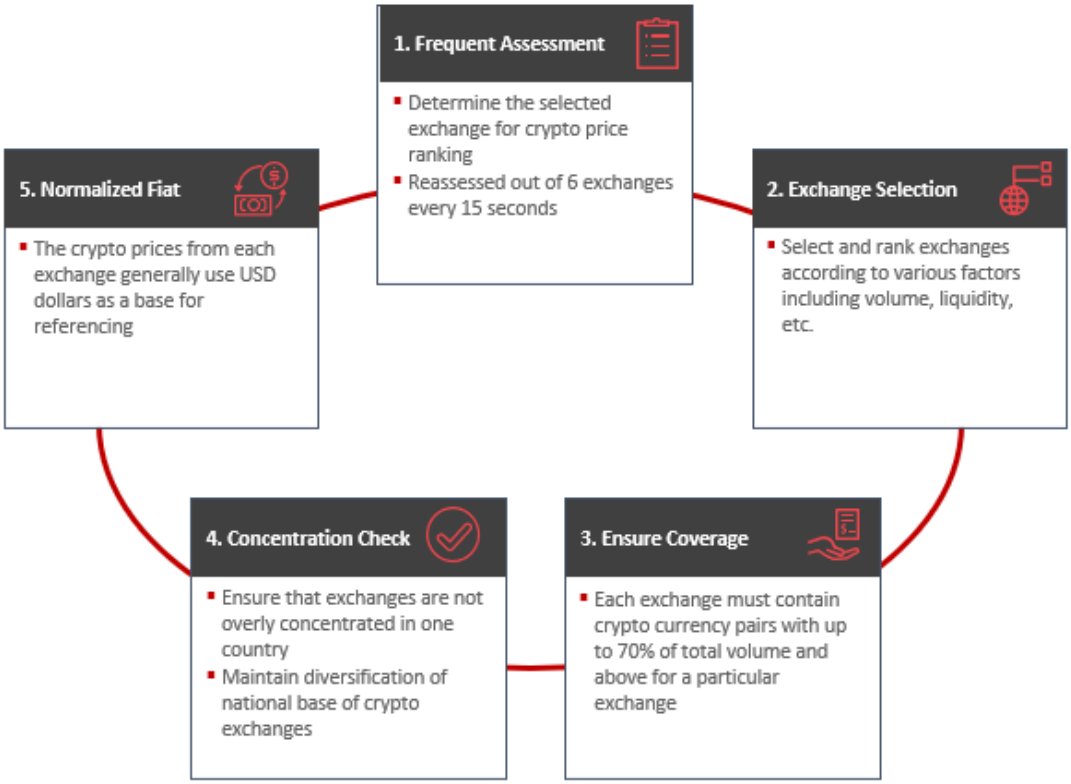


Figure 1: Method for Collecting and Ranking Crypto Prices from Top crypto exchanges Globally

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How to get Index API

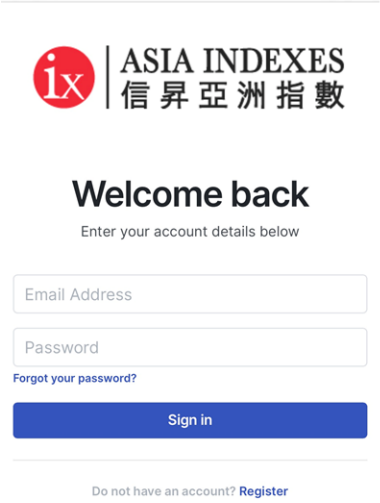
Fast and Stable

IX Asia Indexes offers API access for investors, researchers, or others interested in high-quality crypto index data. We provide API token authentication for API access.

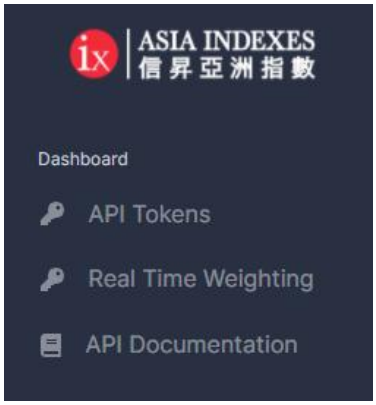
Retrieving Indexes

Users can retrieve the latest indexes data including ixCrypto Index (“IXCI”), ixBitcoin Index (“ IXBI”) and ixEthereum Index (“IXEI”) realtime (every 5 second) to create their charts, excel spreadsheet connected to formulas for their analytical work in a few steps.

Step1: Register on the development console - IX Asia Indexes and login;

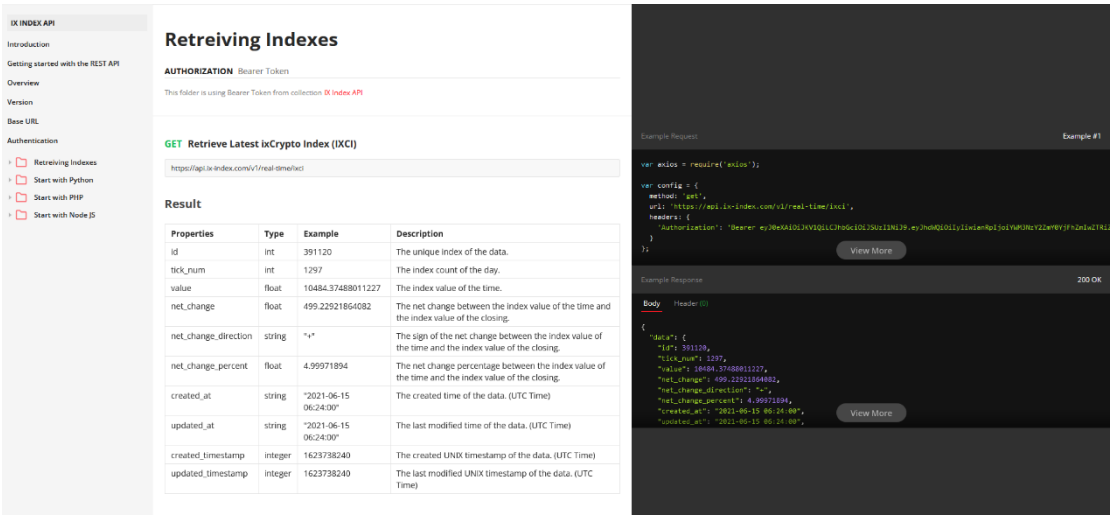


STEP 2 Create API token and keep the token in a safe place



STEP 3: You can now read the API document and download the full example

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IX INDEX API

Introduction

Getting started with the REST API

Overview

Version

Base URL

Authentication

Retreiving Indexes

Start with Python

Start with PHP

Start with Node JS

Retreiving Indexes

AUTHORIZATION Bearer Token

This folder is using Bearer Token from collection IX Index API

GET Retrieve Latest ixCrypto Index (IXCI)

https://api.ix-index.com/v1/real-time/ixci

Result

Properties	Type	Example	Description
id	int	391120	The unique index of the data.
tick_num	int	1297	The index count of the day.
value	float	10484.37488011227	The index value of the time.
net_change	float	499.22921864082	The net change between the index value of the time and the index value of the closing.
net_change_direction	string	"+"	The sign of the net change between the index value of the time and the index value of the closing.
net_change_percent	float	4.99971894	The net change percentage between the index value of the time and the index value of the closing.
created_at	string	"2021-06-15 06:24:00"	The created time of the data. (UTC Time)
updated_at	string	"2021-06-15 06:24:00"	The last modified time of the data. (UTC Time)
created_timestamp	integer	1623738240	The created UNIX timestamp of the data. (UTC Time)
updated_timestamp	integer	1623738240	The last modified UNIX timestamp of the data. (UTC Time)

Example Request — Example #1

```
var axios = require('axios');

var config = {
  method: 'get',
  url: 'https://api.ix-index.com/v1/real-time/ixci',
  headers: {
    'Authorization': 'Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJhdWQiOiIyIiwianRpIjoiYWM2NzY2ZmY0YjFhZmIwZTRiZ
  }
};
```

View More

Example Response — 200 OK

Body Header (0)

```
{
  "data": {
    "id": 391120,
    "tick_num": 1297,
    "value": 10484.37488011227,
    "net_change": 499.22921864082,
    "net_change_direction": "+",
    "net_change_percent": 4.99971894,
    "created_at": "2021-06-15 06:24:00",
    "updated_at": "2021-06-15 06:24:00",
```

View More

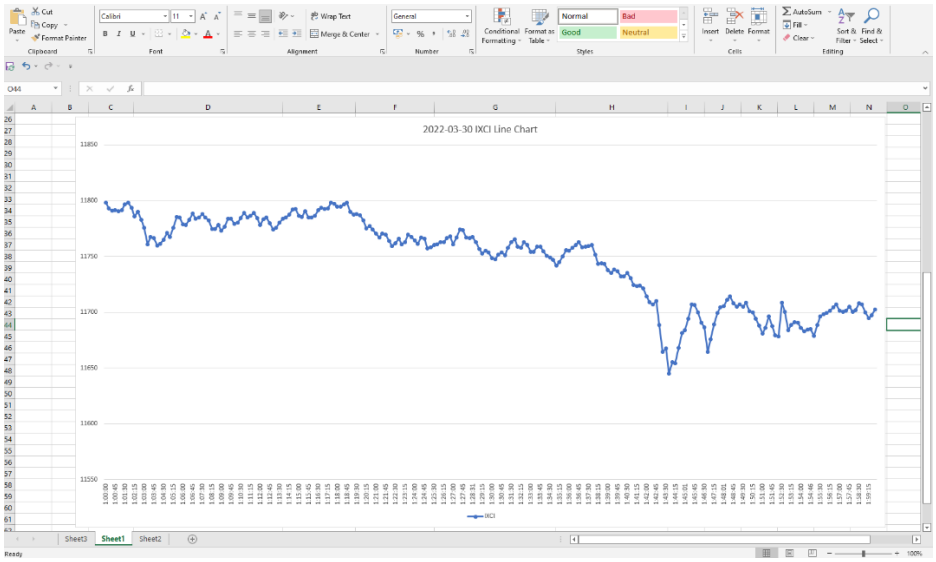
Step 4: Create your chart or excel spreadsheet

ix Crypto Benchmark Index

Ticker	Value	Net Change	Net Change Percentage	Updated At
ixCrypto Index	11865.92136	-135.6313889	-1.13%	2022-03-30 8:59:45
ixCrypto Bitcoin Index	11457.20965	-105.521349	-0.91%	2022-03-30 8:59:45
ixCrypto Ethereum Index	29221.2817	-561.661687	-1.89%	2022-03-30 8:59:45

ix Crypto Spot Price Index

Ticker	Value	Net Change	Net Change Percentage	Updated At
ixBitcoin SP index	46495.21147	11.28985987	0.02%	2022-03-30 8:59:45
ixEthereum SP index	3313.352485	37.83154021	1.15%	2022-03-30 8:59:45
ixCardano SP index	1.135267077	-0.004752636	-0.42%	2022-03-30 8:59:45
ixRipple SP index	0.850035046	-0.011554912	-1.34%	2022-03-30 8:59:45
ixDogecoin SP index	0.140689463	-0.004889165	-3.36%	2022-03-30 8:59:45
ixSolana SP index	112.0986403	2.11341026	1.92%	2022-03-30 8:59:45
ixPolkadot SP index	22.34010566	-0.489592713	-2.14%	2022-03-30 8:59:45
ixBitcoin Cash SP index	366.3711701	1.305857537	0.36%	2022-03-30 8:59:45
ixLitecoin SP index	126.8260514	-0.728470727	-0.57%	2022-03-30 8:59:45
ixTerra SP index	106.3132416	11.53054868	12.17%	2022-03-30 8:59:45
ixPolygon SP index	1.683407836	-0.019221863	-1.13%	2022-03-30 8:59:45



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Easy to use with multiple programming language available

We provide complete examples of popular programming languages including Python, PHP and Node JS. Users may download the complete examples to see how to connect to the index API. A IX Index API User Guide is available upon request.

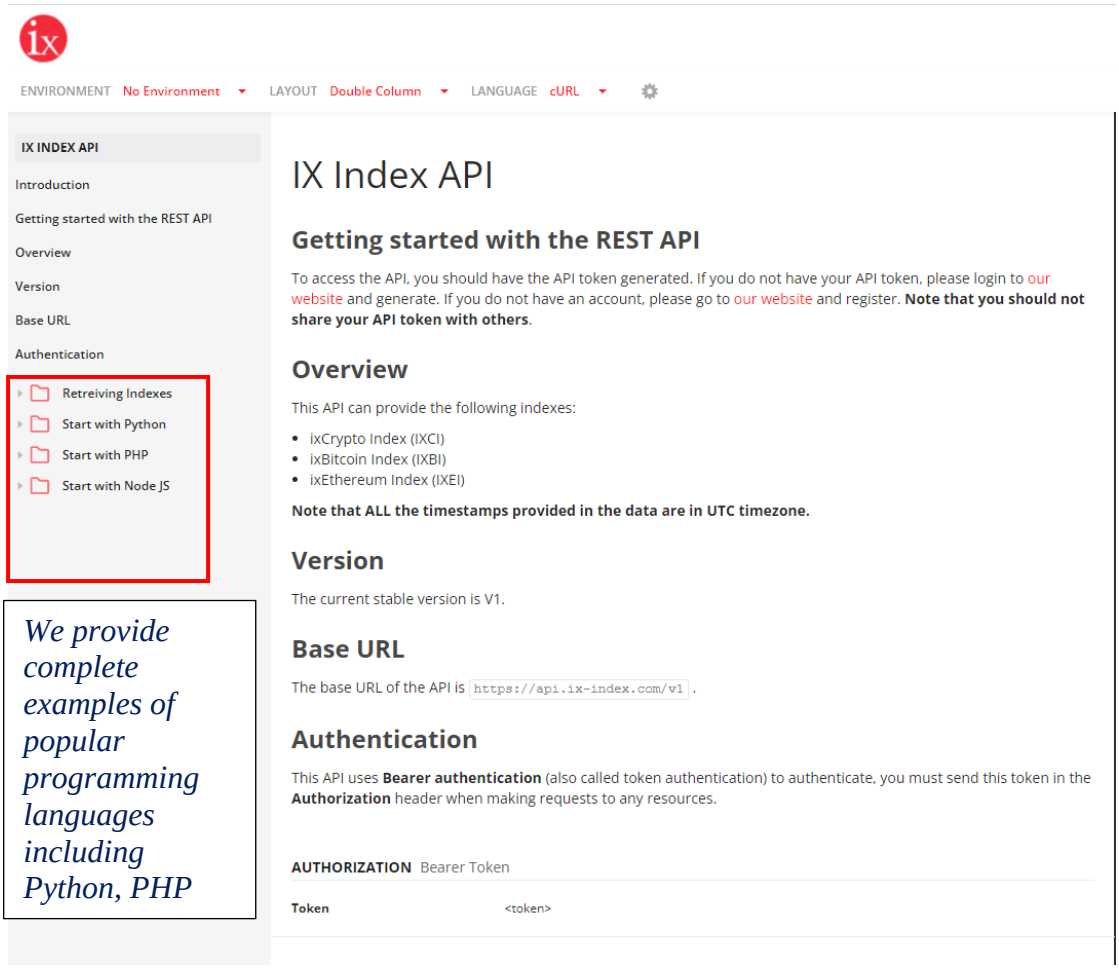
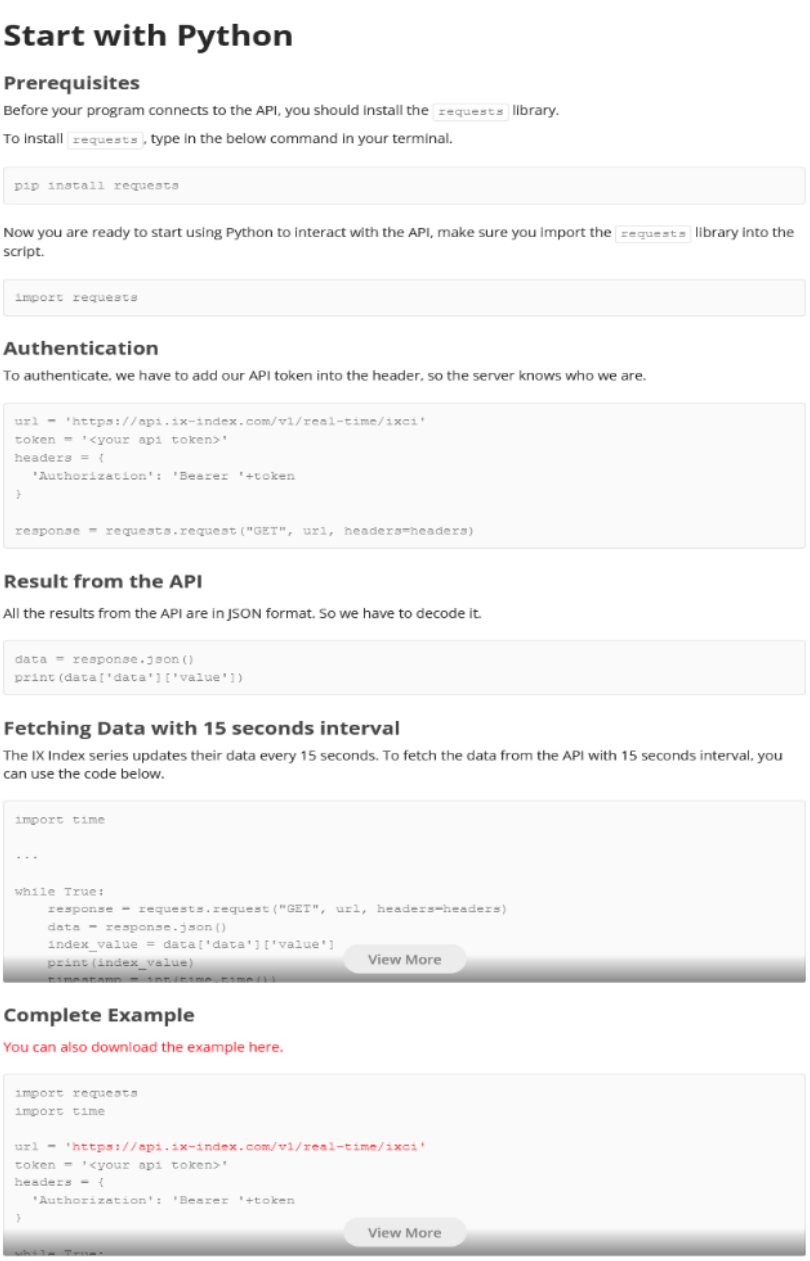


Figure 2: A screenshot of the API document-IX Asia Indexes

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Start with Python

Prerequisites

Before your program connects to the API, you should install the `requests` library.

To install `requests`, type in the below command in your terminal.

```
pip install requests
```

Now you are ready to start using Python to interact with the API, make sure you import the `requests` library into the script.

```
import requests
```

Authentication

To authenticate, we have to add our API token into the header, so the server knows who we are.

```
url = 'https://api.ix-index.com/v1/real-time/ixci'
token = '<your api token>'
headers = {
  'Authorization': 'Bearer '+token
}

response = requests.request("GET", url, headers=headers)
```

Result from the API

All the results from the API are in JSON format. So we have to decode it.

```
data = response.json()
print(data['data']['value'])
```

Fetching Data with 15 seconds interval

The IX Index series updates their data every 15 seconds. To fetch the data from the API with 15 seconds interval, you can use the code below.

```
import time

...

while True:
    response = requests.request("GET", url, headers=headers)
    data = response.json()
    index_value = data['data']['value']
    print(index_value)
```

View More

Complete Example

You can also download the example here.

```
import requests
import time

url = 'https://api.ix-index.com/v1/real-time/ixci'
token = '<your api token>'
headers = {
  'Authorization': 'Bearer '+token
}
```

View More

Figure 3: A screenshot of an complete example with code download available

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Product and data licensing

Licensing from IX Asia Index Company Limited ("Company") is required for the creation of products whose performance is linked to a particular index in the portfolio of IX Asia Indexes or for the dissemination of IX Asia Indexes. If you are interested in licensing, obtaining product specification and/or sample data files, please contact us at licensing@ix-index.com.

the volume buffer varies according to the number of constituents selected, which is at least 2 times the number. For example if the number of constituent is 11, then the volume test should be within the top 25. And when the number of constituent grows to 25 then the volume buffer should be within 50.

~END~

About Us

Story of the IX Crypto Index

The Founder has been a full supporter of her school - University of Hong Kong and had been a long-time mentor in its mentorship programme. During the second quarter in 2018, she designed a programme for the new mentees. In normal circumstances, mentees only require to commit 3 months in their internship. The Founder decided to teach something which required less trading sense and product knowledge but more in statistics. Having witnessed the big correction of Bitcoin in 2017 from almost $20,000 to less than $4,000, she made up her mind to create an inhouse research benchmark index for teaching her university students. She believed that by creating an index, this may as well provide an alternative product for a basket of coins for risk diversification instead of building on a single, volatile and risky underlying product. Moreover, this as well could help to drive the interest on Bitcoin trading without regulation constraints and real asset backed. She trusted that this potential product can minimize the single constituent risk and provide access of performance to the whole market without the need of purchase of actual underlying asset. With this aspiration and vision, the Founder and HKU student launched the first Hong Kong cryptocurrency - ixCrypto Index in December 2018, which is a market benchmark index with a 40% cap on the largest single constituent. "This is great for graduates as well, rather than showing people a piece of certificate. They could share with people that they created an index. I hope these projects can help these young people get their dream jobs," Irene, the founder said. The index has since been through multiple enhancements in terms of both methodology and technical infrastructure, and has grown into a well-recognised crypto index disseminated to over 50 countries through NASDAQ's GIDS.

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Appendix 1

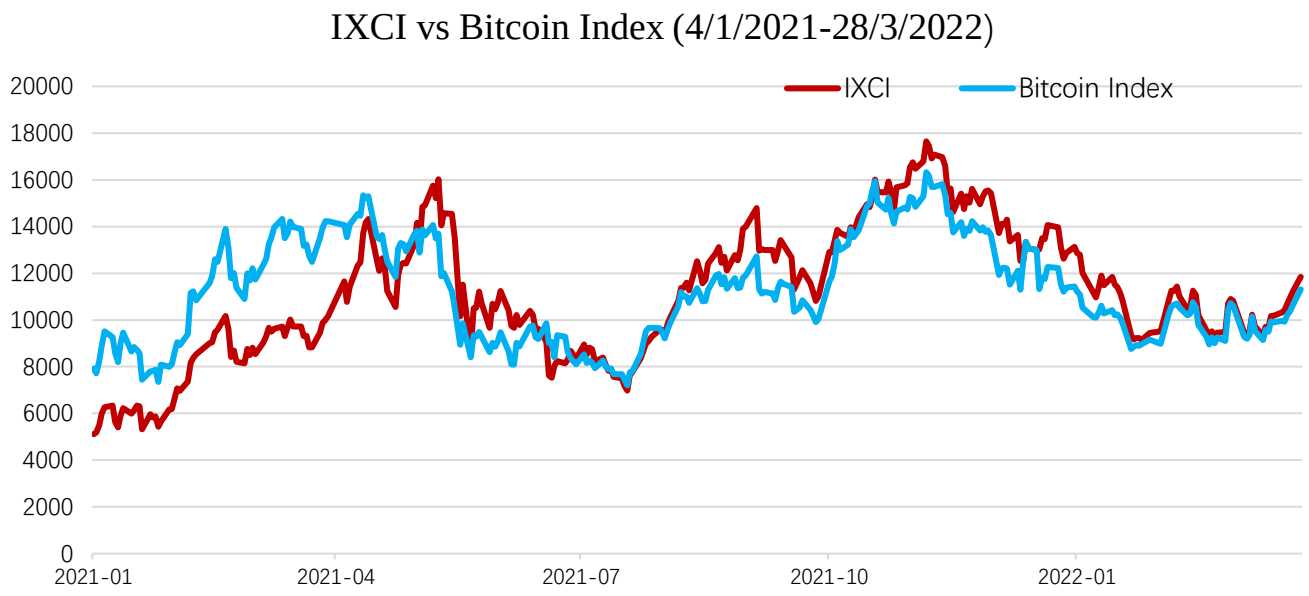


Figure 4: IXCI outperformed the Bitcoin prices most of the time from May 2021

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