

What Is Claimed Is:

1. A computer-implemented method for data traversal, the method comprising:
 - obtaining one or more key-value pairs from a program for use on a blockchain, wherein the program is a smart contract provided for execution on the blockchain;
 - indexing one or more keys of the one or more key-value pairs to generate an index, the index associating the one or more keys with an identifier of the program, said identifier uniquely identifying the program;
 - retrieving at least one value in the one or more key-value pairs based on the index;
 - recording one or more characteristics of the index on the blockchain; and
 - determining whether a plurality of nodes maintaining the blockchain are in an agreement with respect to the one or more characteristics of the index,
 - in response to a determination that the plurality of nodes are not in an agreement with respect to the one or more characteristics of the index, updating the index.
2. The method of claim 1, further comprising:
 - recording the index locally on a computer implementing the method.
3. The method of claim 1, wherein the identifier of the program comprises an address assigned to the program when the program is incorporated into the blockchain.
4. The method of claim 3, wherein the one or more characteristics of the index comprise a number of keys recorded in the index.

5. The method of claim 3, wherein the one or more characteristics of the index comprise a hash value of the index.
6. The method of any preceding claim, wherein the index associates a key of each of the one or more key-value pairs with the identifier of the program.
7. The method of any preceding claim, wherein the one or more key-value pairs include a group of key-value pairs as corresponding to a map, and the index associates a key of each key-value pair in the group of key-value pairs with the identifier of the program and an identifier of the map.
8. The method of claim 6, further comprising:
 - receiving a traversal request, the traversal request including information corresponding to the identifier of the program; and
 - retrieving, from the index, a key list containing the one or more keys of the one or more key-value pairs based on the traversal request.
9. The method of claim 7, further comprising:
 - receiving a traversal request, the traversal request including information corresponding to the identifier of the program and the identifier of the map; and
 - retrieving, from the index, a key list containing the key of each key-value pair in the group of key value pairs based on the traversal request.
10. The method of any of claims 8 to 9, further comprising:
 - retrieving a value corresponding to each key contained in the key list.

11. A device for data traversal, comprising:
one or more processors; and
one or more computer-readable memories coupled to the one or more processors and having instructions stored thereon that are executable by the one or more processors to perform the method of any of claims 1 to 10.
12. An apparatus for data traversal, the apparatus comprising a plurality of modules for performing the method of any of claims 1 to 10.
17. A non-transitory computer-readable medium having stored therein instructions that, when executed by a processor of a device, cause the device to perform the method of any of claims 1 to 14.