Summary

[0009] The embodiments described herein include, but are not limited to, various devices, systems, methods, and computer program products.

[0009a] According to a first aspect of the present invention, there is provided a method including:

displaying by a computing device a design canvas area;

receiving by the computing device from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm;

receiving by the computing device a selection of one or more selected placed blocks of the plurality of placed blocks;

receiving by the computing device a grouping command;

generating by the computing device a group block based on the one or more selected placed blocks in response to the grouping command;

placing by the computing device in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks;

receiving by the computing device a virtualizing command for the group block;

converting by the computing device the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated; and

instantiating by the computing device a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

[0009b] According to a second aspect of the present invention, there is provided a non-transitory computer readable medium having stored therein instructions executable by a processor, wherein the instructions are executable to:

display a design canvas area;

receive from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm;

receive a selection of one or more selected placed blocks of the plurality of placed blocks;

receive a grouping command;

generate a group block based on the one or more selected placed blocks in response to the grouping command;

place in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks;

receive a virtualizing command for the group block;

convert the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated; and

instantiate a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

[0009c] According to a third aspect of the present invention, there is provided a system including:

a computing device,

wherein the computing device is configured to display a design canvas area,

wherein the computing device is configured to receive from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm,

wherein the computing device is configured to receive a selection of one or more selected placed blocks of the plurality of placed blocks,

wherein the computing device is configured to receive a grouping command,

wherein the computing device is configured to generate a group block based on the one or more selected placed blocks in response to the grouping command,

wherein the computing device is configured to place in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks, wherein the computing device is configured to receive a virtualizing command for the group block,

wherein the computing device is configured to convert the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated, and

wherein the computing device is configured to instantiate a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

[0010] Certain embodiments provide building block buttons and an algorithm area to define an algorithm. Certain embodiments allow for adjusting both the parameters and the logic of an algorithm rapidly, even during a single trading session. Certain embodiments provide live evaluation of an expression as the algorithm is being defined. Certain embodiments reduce the risks of traditionally programmed algorithms such as syntax errors, unclear logic, and the need for a non-trader programmer to develop the algorithm as specified by a trader by reducing or eliminating the writing of programming code by a user. Certain embodiments provide a single application for building, debugging, and simulating (with real market data) an algorithm all at the same time. In addition, the single application may also provide for initiating the placement of orders using the algorithm.

[0011] Certain embodiments provide a design canvas area and blocks for designing an algorithm. Certain embodiments provide blocks with complex functionality for use in an algorithm. Certain embodiments provide for grouping blocks placed in the design canvas area. Certain embodiments provide for virtualized group blocks enabling dynamic instantiation of portions of an algorithm to handle particular discrete events. Certain embodiments allow for adjusting both the parameters and the logic of an algorithm rapidly, even during a single trading session. Certain embodiments provide live feedback for blocks

as the algorithm is being designed. Certain embodiments provide safety features to reduce potential errors when an algorithm is designed. Certain embodiments provide for operation of some or all portions of an algorithm when a connection between a client device and an algorithm server is broken. Certain embodiments reduce the risks of traditionally programmed algorithms such as syntax errors, unclear logic, and the need for a non-trader programmer to develop the algorithm as specified by a trader by reducing or eliminating the writing of programming code by a user. Certain embodiments provide a single application for building, debugging, and simulating (with real market data) an algorithm all at the same time. In addition, the single application may also provide for initiating the placement of orders using the algorithm.

CLAIMS

1. A method including:

displaying by a computing device a design canvas area;

receiving by the computing device from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm;

receiving by the computing device a selection of one or more selected placed blocks of the plurality of placed blocks;

receiving by the computing device a grouping command;

generating by the computing device a group block based on the one or more selected placed blocks in response to the grouping command;

placing by the computing device in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks;

receiving by the computing device a virtualizing command for the group block;

converting by the computing device the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated; and

instantiating by the computing device a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

2. The method of claim 1, wherein the input of the virtualized group block is connected to an output of a first block in the plurality of placed blocks that provides fill confirmation discrete events, wherein each fill confirmation discrete event corresponds to at least a portion of a quantity of an order being filled.

3. The method of claim 2, wherein the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block provides hedging functionality

for the at least a portion of the quantity of the order that was filled corresponding to the received discrete event.

4. The method of claim 1, wherein the plurality of placed blocks includes a first block, wherein the functionality corresponding to the first block is based on a connection state between the computing device and an algorithm server when the trading algorithm is processed by the algorithm server.

5. The method of claim 4, wherein the connection state between the computing device and the algorithm server is provided to the first block by a connection to an input of the first block from a connection state input block.

6. A non-transitory computer readable medium having stored therein instructions executable by a processor, wherein the instructions are executable to:

display a design canvas area;

receive from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm;

receive a selection of one or more selected placed blocks of the plurality of placed blocks;

receive a grouping command;

generate a group block based on the one or more selected placed blocks in response to the grouping command;

place in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks;

receive a virtualizing command for the group block;

convert the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated; and

instantiate a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

7. The computer readable medium of claim 6, wherein the input of the virtualized group block is connected to an output of a first block in the plurality of placed blocks that provides fill confirmation discrete events, wherein each fill confirmation discrete event corresponds to at least a portion of a quantity of an order being filled.

8. The computer readable medium of claim 7, wherein the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block provides hedging functionality for the at least a portion of the quantity of the order that was filled corresponding to the received discrete event.

9. The computer readable medium of claim 6, wherein the plurality of placed blocks includes a first block, wherein the functionality corresponding to the first block is based on a connection state between a computing device including the processor and an algorithm server when the trading algorithm is processed by the algorithm server.

10. The computer readable medium of claim 9, wherein the connection state between the computing device and the algorithm server is provided to the first block by a connection to an input of the first block from a connection state input block.

11. A system including:

a computing device,

wherein the computing device is configured to display a design canvas area,

wherein the computing device is configured to receive from a user, in the design canvas area, an arrangement of a plurality of placed blocks, wherein the arrangement of the plurality of placed blocks specifies a definition for a trading algorithm,

wherein the computing device is configured to receive a selection of one or more selected placed blocks of the plurality of placed blocks,

wherein the computing device is configured to receive a grouping command,

wherein the computing device is configured to generate a group block based on the one or more selected placed blocks in response to the grouping command,

wherein the computing device is configured to place in the design canvas area the group block, wherein the group block includes the one or more selected placed blocks, wherein the computing device is configured to receive a virtualizing command for the group block,

wherein the computing device is configured to convert the group block into a virtualized group block in response to the virtualizing command, wherein the virtualized group block is a block that when a discrete event is received on an input of the virtualized group block, a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block is instantiated, and

wherein the computing device is configured to instantiate a new instance of the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block when the virtualized group block receives a discrete event on an input of the virtualized group block.

12. The system of claim 11, wherein the input of the virtualized group block is connected to an output of a first block in the plurality of placed blocks that provides fill confirmation discrete events, wherein each fill confirmation discrete event corresponds to at least a portion of a quantity of an order being filled.

13. The system of claim 12, wherein the algorithm functionality represented by the one or more selected placed blocks in the virtualized group block provides hedging functionality for the at least a portion of the quantity of the order that was filled corresponding to the received discrete event.

14. The system of claim 11, wherein the plurality of placed blocks includes a first block, wherein the functionality corresponding to the first block is based on a connection state between the computing device and an algorithm server when the trading algorithm is processed by the algorithm server.

15. The system of claim 14, wherein the connection state between the computing device and

the algorithm server is provided to the first block by a connection to an input of the first block from a connection state input block.