ADE Concurrent Game

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1 Rule of the game

The game apply to a special set of indirect connected graphs (called ADE graphs).

- A graphs: An "A" graph is a graph where all the nodes connected linearly. We numberred them from left to right start from V1. For example, "A6" graph will have six nodes, namely V1, V2, ..., V6 where V1 connects with V2, V2 connects with V3 and so on.

- D graphs: A "D" graph is similar to an "A" graph but with one extra node connects to the second node (V2). We called this special node V0. For example "D5" graph has five node, namely V0, V1, V2, ... V4 where V1 connects with V2, V2 connects with V3 and so on. And we have V0 connects with V2 as well. A "D" graph must have at least 4 node.

- D graphs: An "E" graph is similar to an "A" graph but with one extra node connects to the third node (V3). We called this special node V0. For example "E7" graph has five node, namely V0, V1, V2, ... V6 where V1 connects with V2, V2 connects with V3 and so on. And we have V0 connects with V3 as well.

Each node in the graph has a number (integer) associated with. In the case of ADE graphs, originally, there are only positive nodes in the graph which can have any value (in constract with the standard ADE Game). In each step, you can choose to "fire" at all positive nodes in the graph, and the values of the graph will be changed as follows:

- The value of the firing node will be negated.

- The values of any neighbouring node will be the same as the current value of that node plus the value of the firing node.

- The values of the other nodes are the same.

The firing rule is applied concurrently for all positive nodes. So if a negative node next to two positive nodes, its value will be the same as the current value of that node plus the value of its positive neighbouring nodes. If a positive node next to two positive nodes, its value will be the same as the sum of its positive neighbouring nodes minus the current value of that node.

2 Control the applet

The applet have four parts: The menu bar at the top, the graphic area on the left, the tracing area on the right and the button bar at the bottom.

1. The menu bar has two menus: Game and About. You can create a new game from Game menu, and get help from About menu.

2. The graphic area is for displaying of the current graph.

3. The tracing area keeps the history of the graph.

4. The button bar gives control of the applet.

There are two modes for the game, namely: Editing, Playing. In each mode, the menu bar will be changed accordingly.

2.1 Editing mode

There are three buttons in this mode: Help, Load and Playing.

- Help: Display help information for this mode.

- Load: Load any ADE Graph. A dialog will open for you to choose the type of the graph (A, D, E) and the degree of the graph. Once the graph is loaded, you can set the value for any node by clicking at that node.

- Playing: After loading a graph, you can change to playing mode with this button.

2.2 Playing mode

There are six buttons in this mode: Help, Undo, Fire, Exhaust fire, Show graph and Editing.

- Help: Display help information for this mode.

- Undo: Undo the last firing.

- Fire: Fire at all positive nodes.

- Exhaust fire: Fire at all positive nodes until there are only negative nodes. Notice that this function terminates for some configurations only.

- Show graph: Show the firing sequence graph, in a new window. The firing sequence graph is the graphof all positive nodes. The value of the node denoted by the number of rings and also by the number on the top right of the node. You can set the maximum number of rings using the combo box. Zero means there is no maximum number. For each layers of the graph, the total value of the graph (the sum of all positive node) is displayed on the right-hand side. The total number of layers display at the bottom. There is a button bar in the new window which has five buttons described below:

- OK: Close the firing sequence graph window and go back to the main window.

- Fire: Fire at all positive nodes, this help you to see how the firing sequence graph is build.

- Undo: Undo the last firing.

- Save: Save the current firing sequence graph (to TGA image). This option is only available when running the program locally.

- Help: Display help information about the firing sequence graph.

- Editing: Go back to editing mode. Clear the graph and tracing area.