We assume the pair (x, y, z) represents Vertex x, the current state of it is y, and its received message is z.

1. First Superstep

* The initial state is {(1, 9, null), (2, 1, null), (3, 6, null), (4, 8, null)}. Since it is the first superstep, no messages are received for all of them (message equals Integer.MAX\_VALUE in the program).
* According to directed edges between vertices, Vertex 1 will not receive a message from Vertex 3 because 9 is greater than 6. Vertex 2 will receive a message 9 from Vertex 1, because 1 is smaller than 9. Vertex 3 will not receive a message from Vertex 2 because 6 is greater than 1. Vertex 4 will not receive any messages from Vertex 2 or 3 because 8 is greater than 1 or 6.

So, the resulting state is {(1, 9, null), (2, 1, 9), (3, 6, null), (4, 8, null)}.

* No messages will be sent to other nodes in the next superstep.

1. Second Superstep

* The initial state is {(1, 9, null), (2, 9, null), (3, 6, null), (4, 8, null)}. Since in the last step of the previous superstep, no messages are sent. And the Vprog function applies the new state 9 to Vertex 2 since max(1,9) = 9.
* According to directed edges between vertices, and not send a message if the vertex state has not changed, Vertex 3 will receive a message 9 from Vertex 2, because 6 is smaller than 9. Vertex 4 will receive a message 9 from Vertex 2, because 8 is smaller than 9.

So the resulting state is {(1, 9, null), (2, 9, null), (3, 6, 9), (4, 8, 9)}

* No messages will be sent to other nodes in the next superstep.

1. Third Superstep

* The initial state is {(1, 9, null), (2, 9, null), (3, 9, null), (4, 9, null)}. Since in the last step of the previous superstep, no messages are sent. And the Vprog function applies the new state 9 to Vertex 3 and Vertex 4 since max(6,9) = 9 and max(8,9)=9.
* According to directed edges between vertices, and not send a message if the vertex state has not changed, Vertex 1 will not receive a message from Vertex 3 since their state value are both equal to 9. Vertex 4 will not receive a message from Vertex 3 since their state value are both equal to 9.

So the resulting state is {(1, 9, null), (2, 9, null), (3, 9, null), (4, 9, null)}

* No messages will be sent to the other nodes in the next superstep.

So finally, 9 is the max value in the given graph, and the program finishes.