NIO

A significant problem with using NIO has been identified by one of your classmates. Java NIO does not yet support multicast datagrams. That is, one cannot create a channel associated with MulticastSocket. ¹

To work around this limitation, the second paragraph of “Query Flooding” section should say:

A node should use multiple threads.
In one thread, a node should employ NIO to handle all concurrent TCP, such as messages exchanged with the coordination site or a node sending a QUERY_RESPONSE. For this use a ServerSocketChannel, which is a selectable channel for TCP listening sockets, and one or more SocketChannels, which are selectable channels for TCP sockets.
For each MulticastSocket which a node joins, the node should run a thread that receives DatagramPackets containing QUERY_REQUEST messages.

Message Format

The QUERY_REQUEST message needs one more field:
Respoder: IPaddress:number

This field indicates which node should respond to the QUERY_REQUEST. If a node’s local ipaddress and port on its Socket connected to the coordination site is given by this field, then the node should respond.

I note that since there is no maximum query age, the query history (which is needed to process QUERY_REQUESTs) grows indefinitely.

Syntax
Correction:
IPaddress = 3DIGIT.3DIGIT.3DIGIT.3DIGIT

Grading

The web site will tell you how many nodes to start. After all of your nodes have started go back to the web site and it will tell you which of your node(s) should originate a query. The web site will provide you with feedback on how your system did.

¹ However, this support should be available soon. “JSR 203: More New I/O APIs for the Java™ Platform (“NIO.2”)” at http://www.jcp.org/en/jsr/detail?id=203 includes “3. The completion of the socket-channel functionality defined in JSR-51, including the addition of support for binding, option configuration, and multicast datagrams.” and wanted incorporate that into Java 2 Platform, Standard Edition, version 1.5 (“Tiger”). However, this functionality does not appear in J2SE 1.5.0 Beta 1.