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CSE 160
Project 1
Due: 9/22/2020 @3pm

Design Process and Decisions

Our goal for Project 1 was to implement Network Flooding and Neighbor Discovery that would work with different topologies with unknown amounts of nodes. Our initial idea was to implement these systems via modules, but since our initial knowledge was lacking, we finally decided to hard code them into Node.nc with plans to design all future projects in module form.

We implemented flooding before neighbor discovery since we could use the source of the sent flooded packets to add and update a table of neighbors on each node using the same packets. The flooding system checks incoming packages to see if the same source and sequence had been sent before and if the destination is not the current node the package was at (in which case the packet is classified as a duplicate and would be repackaged and sending would not occur). If the package was at the desired destination then nothing would occur and flooding would cease. After flooding, the node would take the source of the received packet and check its "list" of neighbors to see if it had received a packet before and update its table if it hadn't.

For these memory systems, we allocated space using arrays with a set size. We ended up coming to the decision of using arrays due to our lack of knowledge on nesC and how the implementation of arrays is simple. This does limit the memory of each node to the size of the allocated arrays, but it is a simple solution for now which can later on be dynamically updated.

Our first project is also hard coded into Node.nc. Again, our initial idea was to implement project 1 in module form, but the time it took to learn and understand modules was too long to not finish the project on time though we did conclude that hardcoding project 1 into node.nc was beneficial as flooding/neighbor discovery is a structural bases of all future projects. So we decided this first project will be hard coded with plans of future projects to be in module form based on our improved understanding of nesC.

In the end our project process and decisions led to the successful completion of project 1. And our new knowledge and understanding of the system should allow for better implementation of future projects.