CSE 160 Computer Networks
Project 1
Discussion Questions
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Question 1: Describe a pro and a con of using event driven programing.

Event-driven programming describes a model where the "flow of the program is determined by events."

Pro: Flexibility. Event-driven programming programs are extremely adaptable, which means they may be readily updated to match specific needs.

Con: Manual stack management. The difficulty of the control flow and manual stack management is one of the drawbacks of employing this type of architecture.

Question 2: **Flooding includes a mechanism to prevent packets from circulating indefinitely, and the TTL field provides another mechanism.**
What is the benefit of having both?
By having both, we can avoid both indefinite cyclic packet flooding and packet transmission away from the target by using both flooding checks and TTL.
What would happen if we only had flooding checks?
If we only had flooding checks, the network might still be able to rebroadcast the message, given how connected and expansive the network is. However, the message could possible wind up in a separate part of the network.
What would happen if we had only TTL checks?
If we only had TTL checks, packets would be routed in cycles via indirect paths until their TTLs expired. Because the packet has already been routed via those nodes, this is a waste of bandwidth on the network.

Question 3: **When using the flooding protocol, what would be the total number of packets sent/received by all the nodes in the best case situation?**
In the best case, packets are linearly connected. The topology of this could be connected in a line, so 1 is connected to 2, 2 is connected to 3 … etc. Packets would be transmitted forwards and backwards. Total packets sent/received: $2(n - 1)$, for the topology including more than 1.
Worse case situation?
In the worst case, all packets are connected to each other. The topology of this would result in n-1 nodes that send n-1 packets. Total packets sent/received would be the product of both.
Total packets sent/received: (n -1) x (n-1) = (n-1)^2.

Question 4: Using the information gathered from neighbor discovery, what would be a better way of accomplishing multi-hop communication?
Using neighbor discovery allows us to find the most efficient routes for packets to reach their target. A better way to accomplish multi-hop communication can be to utilize sending packages outside the broadcast channel. Having the signal broadcasted to every node connected can help avoid collisions and network congestion.

Question 5: Describe a design decision you could have made differently given that you can change the provided skeleton code and the pros and cons compared to the decision you made?

We created another include file, called packet_id.h. This allowed have an id for the packets.
Pro: We have an ID for the packet
Con: If we want to have all packet information and id, we will have to create 2 list/hashmaps and combine them.
We could've implemented a method that would give us the packet id without having to create another file.