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Project 3 System Network I

Due By: 10/23/16

## Problem

In the code the lizards will try to cross the driveway safety without the cats noticing. First thing to identify is when is it safe. The cats will notice the lizards if there are more than 4 lizards crossing at a time. The only times it is safe if the number of lizards crossing both ways is less than 4 or the cats are asleep. As the pattern of cat's sleep are unpredictable you can assume no more than 4 lizards should cross over at the same time. This means we must synchronize all the lizards together so that they wait for the safe number of lizards on the driveway before trying to cross themselves.

## Changes

In the code, we used two semaphores to delay the lizards. One was a semaphore initialized at 4 to control the flow of lizards when crossing and one to block when the number of lizards on the driveway was 4 or greater. This stops the lizards from crossing in unsafe times. The solution we implemented worked when running the code as the lizards aren't caught. However, I do feel as if there is a better implementation as our understanding of the concept of the semaphore/lock is fine but implementation is a little bit unsure.

## Table

| WORLDEND(S) | Max # of Lizards Crossing | Lizards Safe? |
|---|---|---|
| 30 | 4 | Yes |
| 120 | 4 | Yes |

## Issues

When developing the code the "check if safe" functions were probably the most problematic. It was very easy to implement a busy waiting loop so I see why the instructions said not to. When using the semaphores, I had to also make sure to call at the right times. I tried used a similar semaphore for the cats checking as the lizards crossing which caused quite some problems. Overall as mentioned earlier I feel as if there is a better solution, but I got the program to work without the lizards being detected and the maximum number crossing. I attempted many ways to the problem but this one seemed to work the best.