

Shane Bolding

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Hungry Lizard Crossing

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### **Objectives:**

The objective of this project is to ensure that the crossing of lizards across a driveway doesn't end in disaster. We do this by ensuring that the cats do not notice the lizards crossing by limiting the amount crossing.

### **Introduction:**

To solve this problem, we will use the logic of semaphores to limit the number of lizards to cross the driveway at a time. The semaphores act as a guard that keep track of all that enter and leave the driveway. This will allow the lizards to pass safely.

### **Changes:**

We need to implement semaphore by including semaphore.h to the header. This allows us to create a global semaphore using sem\_t and initializing it in main so that all the little lizards may pass and wait safely. We tested if the lizards passed safely by running the program at multiple world lengths from 30 seconds to 180 seconds. The results of the test are shown below.

WORLDEND	# of Total Lizards	Maximum # of Lizards Crossing	Lizards safe?
30	20	84	yes
60	20	148	yes
90	20	206	yes
120	20	226	yes
150	20	326	yes
180	20	386	yes

*Table 1 Table of the number of lizards that crossed*

We came into a problem when using the thread library in C++. The use of a class function inside calling the creation of a thread created an issue. We fixed this issue by creating the function of the class as a static which caused the compiler to not acted as the function was of a class.

### **Conclusion:**

This project gave us wonderful tools called semaphores that allows the use of threads in a controlled way that allowed the shared use of a critical section. This is a very helpful tool that will be easily used in the future.