WilhanJomas Arcade 2000: Electric Boogaloo

Light Cycle:

Trial list is declared as an array-based list to store the PVector coordinate components x,y,cx,cy of the user bike and the computer bike. The initial declaration for the size of the list is 250000 (500x500). Before hitting the next pixel, the for loop in h() and c() function will ensure the the next pixel has not been included in the list. If it has, it means one of the bikes, or both of them crash, and the game is reset. The for loop takes O(n) steps as it loops through the entire list.

WWII Shooter:

The class Wave contains a complex algorithm that implements a linked-based queue and an array-based list. When Wave is instantiated, the queue “allZombies” and the list “livingZombieList” are declared. The queue is filled with new zombies, which takes O(n) time to loop and enqueue. The purpose of the queue is that by working in concert with the list, a zombie can be dequeued from the list after a defined amount of time and added to the livingZombieList to be drawn. Then, livingZombieList is iterated through and the zombies in the list are drawn. This occurs in O(n) time, because it requires iteration through all the zombies. The reason that livingZombieList is an array-based list is because it’s size is known and therefore the computer is spared the possibility of copying items should the list need to grow. Similarly, I used an array-based queue because the max size of the queue is known from zombieCount.

In the store, there is another data structure, but it was not fully utilized due to time constraints. The items in the store are placed into a link-based list, which allows for easy iteration through the items. This occurs in O(n) time and is a link-based list because, should there be items added to the list in the future, they may be easily inserted.