**Design Idea Worksheet – Print out and fill out one of these for each design idea.**

**Your name: Joshua Ruebusch**

**Design # (each of your designs should have a number): 2**

**This is a (circle one): --New design**

**--Variation, based on design # \_\_\_\_\_\_\_\_ (If it is a variation, you only need**

**to fill in the parts that differ from the basic design)**

**Data structure on which design is based:**

Circular Array

**Describe how the data will be organized:**

Randomly scattered in the array.

**Augmentations**: None of the data structures we have studied fit this problem perfectly, all of them have performance problems if used as-is. In this space describe any changes or additions you are making to the basic data structure to improve performance.

I’m using this as an example of how to do a kind of vanilla version of this problem.

**Performance**: For each of the main methods of the Starbucks.h, describe in detail the algorithm you would use, and then give the asymptotic running time that would result.

**build**

**Algorithm:** Read in file containing starbucks locations to circular array telling it to grow as it gets full. Each cell will contain one ‘x’ and one ‘y’ . These must be turned into actual integers or doubles but cannot remain as strings for the rest of this problem to work.

**Running time: Must go through all locations once to build the array.**

**getNearest**

**Algorithm:** Search the entire array calculating the distance from the starting point and saving the smallest answer until the end is reached. Then this will return which cell of the array has the shortest distance as the nearest starbucks.

**Running time: Must search ALL strabucks locations in order to make proper decision that the nearest starbucks has been found.**

**Accuracy**: How accurate do you expect your solution to be? 1.0 is perfect, 2.0 means off by a factor of 2, and so on. Explain your reasoning.

Accuracy here would be 1.0 as it would check all of the locations and find, without a shadow of a doubt the nearest starbucks. The issue here comes with the fact that this is one of the slowest ways to implement this method.

**Difficulty:** On a scale of 1 to 10, with 1 being “very easy” to 10 being “impossible,” how hard will it be for you to successfully implement this solution in the time allotted (1 week)?

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This is one of the easiest ways to solve this problem. Most likely I will start with this and change to another solution after completing this.