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9 November 2022

CSE Homework 3

Provide short answers for the following questions (3 points each, 18 points total)

1. What are some similarities between arrays and vectors?

Arrays and vectors have a few similarities such as being able to hold information in subsequent locations in memory which can be referenced by index using the variable name. They both can store only one type of data. You can reference specific values held within the array or vector by using the index that the value is located at. Both array and vectors’ indexes start at 0.

2. What are some differences between arrays and vectors?

Arrays are static in their size in that you specify the amount of memory the array should take up therefore, you are not allowed to add or remove cups. Vectors are more dynamic in that you don’t need to specify their size. Arrays are a built-in part of C++ so, as opposed to vectors you do not need to include the library.  
3. What is a pointer?

A pointer is a variable whose value is the memory address of the object it is assigned to.  
4. What is the relationship between a pointer and an array?

Pointers hold the memory address of the variable they were assigned to. Arrays are blocks of sequential data whose memory address for each value is just the previous memory address +1. So, making a pointer that points to an array would give u the memory address of the 0 index of the array allowing you to reference the next cups by index pointer[2].  
5. What is inheritance in object-oriented programming?

Inheritance in object-oriented programming is when one object is able to utilize the functions of another object that it inherited.  
6. What is polymorphism in object-oriented programming?

Polymorphism is where if you have multiple member functions that have the same name as each other, of objects that have a base to derived relationship, and you are still able to call each of these functions from the base and derived objects and the proper one would be called depending on the type of the object as long as the member function is defined as virtual.