SIT102 – Introduction to Programming

Answers for 6.1P Working with Arrays and Vectors

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Question 1: Explain how arrays allow you to easily work with multiple values, compared to using variables.

Arrays make it easy to manage a list by having multiple identical values in it. Instead of making complex calls to many variables individually, the point of an array is to store all variables in one callable object, which makes working with multiple values in an array fast

Question 2: Explain the relationship between the length and valid indexes of an array.

The length of an array is calculated from 1,2,3, then put into the array, such as array[size], and the relationship between the two is that the size of the array is 5 and the maximum index is 4, because the index is calculated from 0 and the size does not count 0.

Question 3: Explain how for loops can be used to work effectively with elements in a static array.

Use a for loop to loop through all the values in an array and check if there is a specific value, or to check the maximum value in the array. You can change values when using a for loop. You can change all the elements of an array using a for loop

Question 4: How could you print out the names in a static array starting with the last name and working back to the first name? Think about how to firstly access the last element of a static array and working back to the first element using a loop. Show with a C++ programming example.

```
  int names[SIZE];
//assume filled array
for (int i = SIZE - 1; i >-1; i--)
{
     write_line(names[i]);
}
```

The name size is array size, and then for inside, an integer i is last element index , it is equal to size - 1, equivalent to the last element from the beginning, when I is greater than negative one, each Loop in the i are decreasing. Finally, write out write the arrays from the final elements in that array to the first element in that array

Question 5: What is the main difference between a static array and a dynamic array (vector)?

Memory is allocated to static arrays at compile time, and memory is allocated to the stack. Memory is allocated to dynamic arrays at run time, and memory is allocated from the heap. Memory is allocated dynamically and has a fixed size statically.

Question 6: How are elements added to a vector in C++? Give a programming example.

" How to add an element to a vector and increase the size of the container by the number of inserted elements. push_back method() in C++ is a method that is part of the vector as a data structure in C++. It is used for pushing elements from the back of the vector.
Like names.push_back(read_string("Enter a name: "));

Question 7: How can you remove an element from a vector in C++? Give a programming example.

Use pop_back removing an element from vector.
C++ pop_back() function is used to pop or remove elements from a vector from the back. The value is removed from the vector from the end, and the container size is decreased by 1.
pop_back();

Question 8: What are the advantages of passing a vector by reference compared to passing by value? In the meantime, what would be the concern when passing by reference is applied and how would a programmer prevent any risk may occur?

A single function cannot return multiple values, but it can use references and pass and update multiple arguments, which makes it easy to modify the function and pass an array or object. You don't need to create a new variable.Between Pass by Value and Pass by Reference. The main difference between pass by value and pass by reference is that, in a pass by value, the parameter value copies to another variable while, in a pass by reference, the actual parameter passes to the function.

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