Class,  
  
 If a string variable "Str" has been declared to be an array of 25 characters, than the length must be 25. Why or why not?

I can say that with arrays the computer would start to count at 0 and so that would have to be factored in when dealing with arrays. I learned this concept originally while working in Java as I discovered a situation with output from an area I created and did not factor in that the index starts at 0 and proceeds from that point forward. Example 7.1 Entering Elements in an Array is a prime example of elements and how they work in an array.

What is an off-by-one error?

An off-by-one error occurs for example when using a looping condition to loop through an array and not looping through the correct amount of times to either store or obtain all the values within. It is important to remember to accurately declare the index in a For Loop properly so that all values are accounted for when the process of iteration occurs. Again this is why it is important to also remember that the computer begins reading at 0 so that if your intention is to store values in an array of 100 elements you could do so by counting from 0 to 99.

This chapter further explained the use of many types of arrays and helped in understanding how they are read by using looping commands. There was pretty good visualization in Figure 8-1 which showed array elements being declared and being assigned unique numerical values values. The index or counting variable acts as a means to begin counting at a certain position in an array. With an array there is less limitation on how many values can be stored versus traditional variables. An array can take in input from a user in a program and then store it as a value in a set and this concept is valuable when it comes to creating more complex programs.

I do not believe that there are any one-based array languages that I could find through much searching that c

I found around three more popular languages such as COBOL, FORTRAN, Julia, and MATLAB which still take advantage of a one-based index array approach. From what I could tell there are far more languages which take advantage of a zero-based system such as the Java language which is definitely more commonly used.

I did compile a list of languages that do take advantage of a one-based array index system which are COBOL, AWK, FORTRAN, Julia, LuamMATLAB

Are there any common languages still widely used in which the arrays are not zero-based?

* What is an example of a programming problem that would be difficult, if not impossible, to code without the use of arrays? Describe the problem and write the pseudocode for it using an array.

What are the similarities and differences of the array and parallel array structures? What is an example of data that is appropriately stored in a parallel array structure?

It could be difficult to design pay rolls systems without some type of array being involved that stores the amount of hours that each employee works such as in the example seen in Program 8-3 of Chapter 8 Arrays. Let’s say for instance a company needed to keep track of the hours and pay that each person should receive, how else could this be done logically without an array? I can’t think of any other way honestly.

Both standard arrays and parallel arrays stay indexed at 0 and hold elements that are of the same datatype. With parallel arrays however there are usually at least two arrays declared that correlate to one another in some manner or fashion. An example could be a set of parallel arrays that take into account individuals names with that of their social security numbers.

When using parallel arrays, if one were to become corrupted, will this also affect the other array?

Parallel arrays typically hold elements that are similar or relate to one another in some manner. If one array were to become corrupted it could cause issues, because both use the same subscript in a parallel array design. If one array were to malfunction during compilation, because of incorrect declaration or use of the index within the code it would also cause the other array to error out as well.

A regional drug company is tracking a particular generic drug and its brand name alternative. Because this data is collected for only 15 days and the sales are rare, the IT department does not want to enter the data into its database. The data must include the following:

* Generic or brand name sold
* Amount sold

**Respond** to the following questions:

* Can an array or parallel array structure be used to store this information?
* What data types would be used in the structure to store this information?

Drug Company

I believe that a parallel array would be sufficient to store both the regional drug companies generic and brand name alternatives since all elements would be related. A For Loop for example might be used to aid in prompting for the user to enter each medication name and storing each of those names in an array. At the same time the user could be prompted to enter the amount purchased (stored in an integer array) after inputting the name of the medication. Once the names of each of the medications have been stored within an array of String datatype as well as the amount purchased it would not be too difficult to step through the parallel array and associate the name with the purchase amount.