0. (1pt.)  
 What are the differences between the strlen() and sizeof() a char\* string pointer in C? Why?

Strlen() is used to find the length of a string whereas sizeof()is used to find the actual size of the data in bytes. Strlen() counts the number of characters in a string, returning the number as an int, and looks for the null values. Sizeof() returns the size of an operand and only cares about the memory. We need both because in some cases we may just want to know the number of characters in a string to perform an action with the actual string substance (using Strlen()), but other times we may we to know the amount of memory it takes so we can potentially allocate a block of memory dynamically (using sizeof()) for example.

1. (6pts.)  
 Write the function  
  
    replace(char base[], char from[], char to[])  
  
which finds the string 'from' in the string 'base' and replaces it with the string 'to'. You may assume that from and to are the same length. For example, the code  
  
    char string[] = "recieve";  
    replace(string, "ie", "ei");  
    //> should change 'string' to "receive".  
  
    \*Be careful not to assume the substring being replaced is singular, or that its own substrings are unique.  
    \*Do not rescan letters already checked/replaced  
        char string[] = "Msissisippi";  
        replace(string, "sis", "iss");  
        //> should change 'string' to "Mississippi" (.. and not miss the second "sis")  
                  
        char string[] = " flajellate";  
        replace(string, "laj", "lag");  
        //> should change 'string' to "flagellate" (.. and not modify "lat")

EX. (2pts)  
Are strlen() and sizeof() of the two string variables below different?  
(run the code to test your assumption - be sure to load <string.h> to get access to strlen())  
Why is strlen() the same or different?  
Why is sizeof() the same or different?  
  
    char\* string0 = "hello";  
    char string1[] = "hello";

Strlen() prints out the same for both char\* string0 and char string1[], both having the answer of 5. This is because strlen() only cares about the length of the string, and in both cases, it holds “hello”, so it’s 5. For sizeof(), they are different where char\* string0 returns 8 while char string1[] returns 6. sizeOf() only looks at memory so char\* string0 is 8 because pointers take 8 bytes and char string[1] returns 6 from the size of the operand.