OBJECTIVES

1. Learn what pointers are and understand what happens in simple examples with pointers.

GENERAL INFORMATION

Pointers, in some view are just like other data types; needs to be declared, stored in a piece of memory, can be changed if they are variables, etc. On the other hand, they are not just a number, but addresses of other data/function in memory. Most new learners ask the question "why do we need pointers?" until they use it with lots of data, they need a function that changes something somewhere else or deal with complex structures like linked lists & trees. In fact, it is very difficult to write a useful c program without the benefits of pointers.

EXPERIMENT

1. NULL terminated character arrays are vastly used in c programs. Therefore, standard c libraries have many functions dealing with them. A constant size character array is declared like
   char ArrayName[ArraySize];
   where ArrayName is bound by naming rules and ArraySize is a constant. For example,
   char A[100]="Osmangazi University";
   reserves 100 bytes in the memory, initializing first 20 characters with corresponding numeric values of the characters in "Osmangazi University". The rest of the array (80 of them) are initialized to 0 (NULL character) as illustrated below.

   | Address | M | M+1 | M+2 |  |  |  |  |  |  | M+20 | ... |
   |---------|---|----|----|---|---|---|---|---|---|---|---|-----|
   | Content | O | s | m | a | n | g | a | z | i | U | n | i | v | e | r | s | i | t | y | N | U | L | L | ... |

   Array name (A) is readily converted to a constant pointer to the first array element (M). Try
   char A[100]="Osmangazi University";
   printf("\%s  \%s\n",A,A+10);
   in function main() and comment on the result.

2. Since the array name can be used as a pointer, & (address of) character is not used when array elements are referred as arguments in scanf; ie,
   scanf("\%s",A); /* not &A % */
   Using this information, write a small c program that asks user to enter his/her name and age. Program should print out "You are mature enough to study harder" if the age is greater than 17. If the age is less than 18, then it should print out "You should go back to high school", adding the name and age as illustrated in the following example; (user entered text is shown bold)
   Enter Name : Ahmet Caliskan
   Enter Age : 19
   You are mature enough to study harder Ahmet Caliskan (19)!

3. strlen function (declared in <string.h> ) returns the number of characters up to (but not including) the NULL character. Write a program that prints out the number of characters in the user entered text. (read about strlen from help files)

QUESTIONS:

1. When the user entered text to scanf has a space in it, how would you separate strings into two character arrays? For example, store "Ahmet" into A[20] and "Caliskan" into B[20];