Pointers and C-String (10 Points w/Extra Credit Option)

This assignment has 5 parts, each must be its own function. Your program should allow the user to enter a test string. This string should be passed to 5 functions in sequence. (The resulting string from the first function should be passed to the second, etc. You do NOT copy the string or make multiple strings.) There should be NO output in the functions, that is handled in main(). These functions are:

1. Count the characters in the string. This function uses the input parameter as its only pointer.
2. Count the vowels in the string. This function uses the input parameter as its only pointer.
3. Upper case the first letter of each word in the string. This function uses the input parameter as its only pointer. It uses that pointer to modify the original string.
4. Uppercase Every letter in the string. This function uses the input parameter as its only pointer. It uses that pointer to modify the original string!
5. Remove the excess spaces in the string. This function uses the input parameter as a source point (where you read from) and a second pointer as the Destination pointer (where you write to). It uses that destination pointer to modify the original string!

At each step the resulting string and/or count should be displayed.

A test plan is required for this assignment. It is very short, but must cover every condition expected in the strings.

Please place function prototypes before main(). And the 5 functions after main().

Extra Credit:

Use a function pointer array to allow the user to select which operation to perform. Your output should show all options. (Hint, each function Must return the same type and have the same parameters.)

Sample Program Output:

```
Howard Miller       CIST 004A

Enter a string: hello there world!  How are you today?  I'm fine.

There are 49 characters in "hello there world!  How are you today?  I'm fine.".

There are 15 vowels in: "hello there world!  How are you today?  I'm fine.".

Upper case first characters: "Hello There World!  How Are You Today?  I'm Fine.".

Shouting: "HELLO THERE WORLD!  HOW ARE YOU TODAY?  I'M FINE.".

Extra spaces removed: "HELLO THERE WORLD! HOW ARE YOU TODAY? I'M FINE.".

Program ended with exit code: 0
```

Extra Credit Sample Program Output (Incomplete...You need to show all 5 functions working.)

```
Howard Miller       CIST 004A
```

Enter a string: hello there world! How are you today? I'm fine.

Select operation to perform on this string.

1 Count the characters in the string.

2 Count the vowels in the string.

3 Uppercase the first character of each word in the string.

4 Uppercase the every character in the string.

5 Remove extra spaces in the string.

6 Enter a new string.

0 Exit this program.

Enter Operation: 1

There are 49 characters in "hello there world! How are you today? I'm fine.".

Select operation to perform on this string.

1 Count the characters in the string.

2 Count the vowels in the string.

3 Uppercase the first character of each word in the string.

4 Uppercase the every character in the string.

5 Remove extra spaces in the string.

6 Enter a new string.

0 Exit this program.

Enter Operation: 3

```
Upper case first characters: "Hello There World!  How Are You
Today?  I'm Fine.".


Select operation to perform on this string.
1  Count the characters in the string.
2  Count the vowels in the string.
3  Uppercase the first character of each word in the string.
4  Uppercase the every character in the string.
5  Remove extra spaces in the string.
6  Enter a new string.
0  Exit this program.
Enter Operation: 0


Program ended with exit code: 0
```

Submit:

Test Plan, .cpp file and output file.