| Activity 4.4 | |
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| **Characters and Strings** | |
| **Course Code:** CPE 007 | **Program:** Computer Engineering |
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| **6. Output** | |

Code:

```cpp
#include <iostream>
#include <cctype>
using namespace std;

int main() {
    char ch [] = "pP5!Dd8&u7$L";
    //islower
    cout << "According to islower: " << endl;
    for (int i = 0; i < 4; i++) {
        if (islower(ch[i])) {
            cout << ch[i] << " is a lowercase letter" << endl;
        }
        else {
            cout << ch[i] << " is not a lowercase letter" << endl;
        }
    }
    //isupper
    cout << "\nAccording to isupper: " << endl;
    for (int i = 4; i < 8; i++) {
        if (isupper(ch[i])) {
            cout << ch[i] << " is an uppercase letter" << endl;
        }
        else {
            cout << ch[i] << " is not an uppercase letter" << endl;
        }
    }
    cout << endl;
    for (int i = 8; i < 11; i++) {
        cout << ch[i] << " converted to uppercase";
        ch [i] = toupper(ch[i]);
        cout << " is " << ch[i] << endl;
    }
    for (int i = 11; i < 12; i++) {
        cout << ch[i] << " converted to lowercase";
```

```
        ch [i] = tolower(ch[i]);
        cout << " is " << ch[i] << endl;

    }
    return 0;
}
```

Output:

```
"C:\Users\Jaime Luis\CLionProjects\untitled\cmake-build-debug\untitled.exe"
According to islower:
p is a lowercase letter
P is not a lowercase letter
5 is not a lowercase letter
! is not a lowercase letter


According to isupper:
D is an uppercase letter
d is not an uppercase letter
8 is not an uppercase letter
& is not an uppercase letter
```

```
u converted to uppercase is U
7 converted to uppercase is 7
$ converted to uppercase is $
L converted to lowercase is l

Process finished with exit code 0
```

Analysis:

In this part, I will execute a problem that will identify a character if its a lowercase or not, uppercase or not, and to convert characters into either uppercase or lowercase. Before going to program execution, I will first insert a <cctype> header because it contains inbuilt functions to handle characters in C/C++ respectively. After that, I will now declare and initialize an array to store characters that will be used in this program. First, I will identify the first 4 characters if it's a lowercase letter or not. To execute this, I will utilize a for-loop and if-else statement. Within the if statement, I will put a condition if the character is lowercase using islower() function. And then, I will now print out the text if the character is lowercase letter or not. Then I will now proceed to the next part. I will identify the 5th-8th characters if it's an uppercase letter or not. I will do the same process as in the previous part but I will now use isupper() function in the if condition. And then, I will now print out the text if it's uppercase letter or not. After this, I will now proceed in converting letters to uppercase or lowercase. In 9th-11th characters, I will convert it to uppercase and in 12th character, I will convert it to lowercase. I will no longer use the if-else statement in this part. Instead, I will print out the unconverted letter first and its succeeding text. And then, I will assign the ch [i] variable with toupper function in 9th-11th character so that it will be converted to uppercase and with tolower function in 12th character so that it will be converted to lowercase. After this, the converted text will now be printed out.

**7. Supplementary Activity**

1.

Code:

```cpp
#include <iostream>
#include <cctype>
using namespace std;

int main() {
    char ch;
    cout << "Insert a character: ";
    cin >> ch;
    if (isalpha (ch)) {
        cout << ch << " is alphabet" << endl;
    }
    else {
        cout << ch << " is not alphabet" << endl;
    }
    if (isalnum (ch)) {
        cout << ch << " is alphanumeric" << endl;
    }
    else {
        cout << ch << " is not alphanumeric" << endl;
    }
    if (isdigit (ch)) {
        cout << ch << " is digit" << endl;
    }
    else {
        cout << ch << " is not digit" << endl;
    }
    if (isblank (ch)) {
        cout << ch << " is blank" << endl;
```

```cpp
    }
    else {
        cout << ch << " is not blank" << endl;
    }
    if (isspace (ch)) {
        cout << ch << " is space" << endl;
    }
    else {
        cout << ch << " is not space" << endl;
    }
    if (iscntrl (ch)) {
        cout << ch << " is control code" << endl;
    }
    else {
        cout << ch << " is not control code" << endl;
    }
    if (isprint (ch)) {
        cout << ch << " is printable character" << endl;
    }
    else {
        cout << ch << " is not printable character" << endl;
    }
    if (isxdigit (ch)) {
        cout << ch << " is hexadecimal Character" << endl;
    }
    else {
        cout << ch << " is not hexadecimal Character" << endl;
    }
    if (ispunct (ch)) {
        cout << ch << " is punctuation mark" << endl;
    }
    else {
        cout << ch << " is not punctuation mark" << endl;
    }
    if (islower (ch)) {
```

```cpp
        cout << ch << " is lowercase letter" << endl;
    }
    else {
        cout << ch << " is not lowercase letter" << endl;
    }
    if (isupper (ch)) {
        cout << ch << " is uppercase letter" << endl;
    }
    else {
        cout << ch << " is not uppercase letter" << endl;
    }
    cout << ch << " converted to lowercase";
    ch = tolower(ch);
    cout << " is " << ch << endl;
    cout << ch << " converted to uppercase";
    ch = toupper(ch);
    cout << " is " << ch << endl;


    return 0;
}
```

Output:

```
"C:\Users\Jaime Luis\CLionProjects\untitled\cmake-build-debug\untitled.exe"
Insert a character:J

J is alphabet
J is alphanumeric
J is not digit
J is not blank
J is not space
J is not control code
J is printable character
J is not hexadecimal Character
J is not punctuation mark
```

```
J is not lowercase letter
J is uppercase letter
J converted to lowercase is j
j converted to uppercase is J


Process finished with exit code 0
```

Analysis:

In this part, I will input one letter that will be used to execute 13 functions. Before executing 13 functions, I will first declare a "ch" variable first and print out the "Insert a character: " before inputting a desired letter by a user. After that, we will now execute 13 functions. To execute this, we will repeatedly use if-else statements except for uppercase and lowercase conversion as it does not use if-else statements and the process is stated in the Output header. After this, I will now run the program and input my desired letter to execution functions (identifier and converter).

2.

Code:

```cpp
#include <iostream>
#include <cctype>
using namespace std;


int main() {
    string l1, l2, l3, l4;
    int n1, n2, n3, n4, total;
// Input strings
    cout << "Enter first number: ";
    cin >> l1;
    cout << "Enter second number: ";
    cin >> l2;
    cout << "Enter third number: ";
    cin >> l3;
    cout << "Enter fourth number: ";
    cin >> l4;
 // Convert strings to integers
    n1 = stoi(l1);
    n2 = stoi(l2);
    n3 = stoi(l3);
    n4 = stoi(l4);
// Sum integers
```

```
    total = n1 + n2 + n3 + n4;

    // Print total

    cout << "The total of the 4 values is: " << total << endl;


    return 0;

}
```

Output:

```
"C:\Users\Jaime Luis\CLionProjects\untitled\cmake-build-debug\untitled.exe"
Enter first number:1000

Enter second number:300

Enter third number:500

Enter fourth number:200

The total of the 4 values is: 2000

Process finished with exit code 0
```

Analysis:

In this part, we will convert strings to integers and then we will sum all of the converted integers. First, I will declare variables under string first so that the inputted numbers will be recognized as string initially before being converted to integer and then I will declare variables under integer so that we have variables to be used in conversion. Next I will code the inputting mechanism. And then, I will code the conversion mechanism using stoi() function. stoi() function is used when we will convert strings to integers. After this, I will code an adding mechanism so that it will add all the inputted values to total. And then, I will now print out the total value.

## 8. Conclusion

In this activity, what I learn are characters and strings, how to identify a particular character if it's under specific function or not, how to convert the letter into uppercase or lowercase, and then how to convert strings into integers. In output section, we were tasked to utilize an islower, isupper, toupper and tolower functions to determine if the particular character is uppercase or lowercase letter or neither, and to convert letters into uppercase or lowercase. I utilized an array there to store multiple characters and for-loop and if-else statements for identification of letters. In the supplementary activity section, I learned that I can identify the inputted letter if it's under a specific function or not and also convert it to uppercase or lowercase at the same time. And then, we were tasked to convert strings to integers as strings cannot do mathematical operations because it is only the sequence of a character and not an actual numerical value. Overall, this activity is not hard at all to me. I just applied my learned knowledge to produce output except for the third item which I need to research to be understood.