Activity No. 4.4	
Characters and Strings	
Course Code: CPE007	**Program:** Computer Engineering
Course Title: Computer Programming Logic and Design	**Date Performed: September 25,2025**
Section: CpE11S1	**Date Submitted: September 25, 2025**
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6. Output

- Screenshot of Code(Readable):

```cpp
#include <iostream>

using namespace std;

int main(){
    char ch1[4] = {'p', 'P', 'S', '!'};
    char ch2[4] = {'D', 'd', '8', '&'};
    char ch3[4] = {'u', '7', '$', 'L'};

    cout << "According to islower: \n";

    for (int i = 0; i < 4; i++){
        if (islower(ch1[i])) {
            cout << ch1[i] << " is a lowercase letter\n";
        }
        else {
            cout << ch1[i] << " is not a lowercase letter\n";
        }
    }

    cout<< endl;
    cout << "According to isupper: \n";

    for (int i = 0; i < 4; i++){
        if (isupper(ch2[i])) {
            cout << ch2[i] << " is a uppercase letter\n";
        }
        else {
            cout << ch2[i] << " is not a uppercase letter\n";
        }
    }

    cout<< endl;

    for (int i = 0; i < 4; i++){
        if (islower(ch3[i])) {
            cout << ch3[i] << " is a converted to uppercase letter: " << (char)toupper(ch3[i]) << endl;
        }
        else if (isupper(ch3[i])) {
            cout << ch3[i] << " is a converted to lowercase letter: " << (char)tolower(ch3[i]) << endl;
        }
        else if (ch3[i]) {
            cout << ch3[i] << " is a converted to uppercase letter: " << (char)toupper(ch3[i]) << endl;
        }

    }
}
```

- Output of Code(label and compile ALL possible outputs):

```
According to islower:
p is a lowercase letter
P is not a lowercase letter
S is not a lowercase letter
! is not a lowercase letter

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

u is a converted to uppercase letter: U
7 is a converted to uppercase letter: 7
$ is a converted to uppercase letter: $
L is a converted to lowercase letter: l

--------------------------------
Process exited after 0.02354 seconds with return value 0
Press any key to continue . . .
```

- In this activity I wanted to use a for loop and an array to check if each of the letters is either an uppercase or a lowercase letter, so first I initialized the letters into 3 different arrays, one array for checking if it is lowercase, one for checking if it is uppercase, and one to convert letters to either their uppercase or lowercase version. Then I used a for loop for each to check each element in the array then an if else statement to check if it meets the condition if it is an uppercase or a lowercase letter. It will then print out if the letters are either uppercase or lowercase; or if they are neither an uppercase or lowercase letter. At the conversion I used 3 iterations, two to check if the given character is an uppercase or lowercase, and one to output something if the given character is not a letter. It will then print the conversion or the placeholder depending if the character is or isn't a letter.

7. Supplementary Activity

Sup. Act. 1

- Screenshot of Code:

```cpp
#include <iostream>

using namespace std;

int main(){
    char ch;

      while (true) {

        cout << "Input a letter or number" << endl;
        cout << "(Type -1 to end): ";
        cin >> ch;
        cout << endl;

        if (isupper(ch)) {
            cout << ch << " is an uppercase letter\n";
            cout << endl;
        }
        else if (islower(ch)) {
            cout << ch << " is a lowercase letter\n";
            cout << endl;
        }
        else if (isdigit(ch)) {
            cout << ch << " is a digit\n";
            cout << endl;
        }
    }
    return 0;
}
```

- Output of Code (label and compile ALL possible outputs):

```
Input a letter or number
(Type -1 to end): 1

1 is a digit

Input a letter or number
(Type -1 to end): a

a is a lowercase letter

Input a letter or number
(Type -1 to end): B

B is an uppercase letter
```

- This code checks if the inputted character is either an uppercase, a lowercase, or a digit. To do this it first sets the character "**ch**" into the character that is inputted by the user, then using if-else statements it would first check if the character is an uppercase letter and output that the character is an uppercase letter. If not it would go to the next if-else statement to check if it is lowercase and output if it is lowercase. If it is neither of the two it would then check if the character is a digit and output that the character is a digit.

Sup. Act. 2

- Screenshot of Code:

```cpp
#include <iostream>
#include <string>

using namespace std;

int main(){
    string s1, s2, s3, s4;
    int n1, n2, n3, n4, total;

    cout << "Input first string: ";
    cin >> s1;
    cout << "Input second string: ";
    cin >> s2;
    cout << "Input third string: ";
    cin >> s3;
    cout << "Input fourth string: ";
    cin >> s4;

    n1 = stoi(s1);
    n2 = stoi(s2);
    n3 = stoi(s3);
    n4 = stoi(s4);

    total = n1 + n2 + n3 + n4;

    cout << "total sum is: " << total << endl;

    return 0;
}
```

- Output of Code (label and compile ALL possible outputs):

```
Input first string: 12
Input second string: 3
Input third string: 4
Input fourth string: 5
total sum is: 24

--------------------------------
Process exited after 1.934 seconds with return value 0
Press any key to continue . . .
```

- In this code I initiated 4 different strings which will be converted to 4 different integers which are also initialized along with another integer for the total. Then I ask for an input for each string which will then be converted to integers using the operation "**stoi**" which converts the strings to integers, then I proceeded to add all of the converted strings to the integer "**total**", that is then outputted by the compiler and shown to the user.

8. Conclusion

This activity and lesson has taught me more about using strings, characters and the other control operators, like how we are able to store strings or characters into an array, different functions we can use to check if the characters are uppercase or lower case like “isupper”, “islower”, “isdigit”, etc. These functions are used in our activity to check characters if they are uppercase or lowercase, an example is in our main activity where we checked if the given characters are either uppercase or lowercase letters, using the function “isupper” to check if the letters “D, d, 8, and &” are uppercase letters using if-else statements, and if the letters “p, P, S, and !” are lowercase letters using “islower”. And also converting given characters to either uppercase or lowercase letters with the functions “toupper” and “tolower”. With that I felt that in these activities I did great for the main activities as I used a for loop to check if any of the characters corresponds to the conditions. But for the supplementary activities I felt that I didn’t do that well as for the first one I wasn’t able to use the other functions in the Character Handling Library as it was giving me an output I did not want, for the third activity I think that I did it decently well.