POO (18:00 - 19:00)

Write the class **CharSet**(that contains a fixed-sized string**)** so that the following code

```
int main()
{
    CharSet c1;
    CharSet c2 = "aabbccdd";
    ((c1 += 'a') += 'b') += 'e';
    cout << "c1 has " << (int)c1 << " elements !" << endl;
    cout << "c2 has " << (int)c2 << " elements !" << endl;
    CharSet c3 = c1 | c2;
    cout << "Union(c1,c2)=";
    c3.print();
    CharSet c4 = c1 & c2;
    cout << "Intersection(c1,c2)=";
    c4.print();
    cout << "c1 has 'a' : " << boolalpha << c1['a'] << endl;
    cout << "c1 has 'z' : " << boolalpha << c1['z'] << endl;
    cout << "c2 is ";
    c2.print();
    cout << "c2 has " << c2("adfg") << " characters from the set 'adfg' " << endl;
}
```

compiles and upon execution prints the following to the screen:

```
c1 has 3 elements !
c2 has 4 elements !
Union(c1,c2)=a,b,c,d,e,
Intersection(c1,c2)=a,b,
c1 has 'a' : true
c1 has 'z' : false
c2 is a,b,c,d,
c2 has 2 characters from the set 'adfg'
```

Carefully read the main function to deduce what methods/operators should be included in CharSet class.

Constraints:

- You are not allowed to use **STL** at all (for vectors, strings, maps or any **template/object** defined in STL). The only exception is the usage of "**std::cout**" from the main function
- You are not allowed to use string manipulation functions defined in "string.h" such as **strlen**, **strcpy**, **strdup, strtok, strcmp**, etc, or string to number conversions.
- If you don't respect the previous conditions (e.g. use strlen, or strcpy, etc) → we will compute the correctness of the code, but the final grade will be half of the computed score for each particular code that uses those functions.

Observations:

- A CharSet class contains a list of characters that behaves like a set (each character can appear only once).

Grading (informative):

G1	**CharSet** default constructor	1p
G2	**CharSet** constructor with one parameter	2p
G3	Organize your project in 3 files: **main.cpp**, **CharSet.h** and **CharSet.cpp**	1p
G4	Organize your class **CharSet** to include private and public members, the definition of a constructor, and at least one operator.	2p
G5	Operator += to add a character into a set	4p
G6	Operator & to perform set intersection operation	4p
G7	Operator **|** to perform set union operation	4p
G8	Cast to int provides the number of elements from a set	2p
G9	Operator function call to count how many characters from a string exists in the CharSet	3p
G10	Operator [] to check if a character exists or not in the CharSet	2p
G11	Method print to show the CharSet	2p
G12	The program compiles and upon execution produces the expected results	3p