

## String to Integer Conversion

It is easy to convert strings to integers by designing a simple algorithm. Numbers can be constructed by taking each digit and multiplying it by the correct power of 10. For example, to create the number 123 it is possible to take the following equation:  $3*10^0 + 2*10^1 + 1*10^2 = 3*1 + 2*10 + 1*100 = 123$ .

It turns out that a string works great with this algorithm. You can extract any specific character in the string by using the [] operator. You can also determine how many characters are in a string by calling the *size()* function. This allows us to create a for loop that runs through each character in the string and multiply it by the appropriate power. It's important however to check to see if the number is positive or negative. This is done by checking to see if the first character is a '-', setting an offset for the loop and multiplying the end result by -1 if it is. The only thing that is left is to design a function that converts an individual character to the appropriate integer. This can be done very easily with a switch statement.

### Source Code

```
#include <string>
#include <cmath>

using namespace std;

// Function Prototypes
int StringToInteger(string original);
int charToInt(char character);

int StringToInteger(string original) {
    int size = original.size();
    int offset = 0;
    int value = 0;

    // Check To See If There Is A '-' Character
    if (original[0] == '-') {
        offset = 1;
    }

    // Loop To Calculate The Value
    for (int counter = 0 + offset; counter < size; counter++) {
        value += charToInt(original[counter]) * pow(double(10),
double(size - counter - 1));
    }

    // If there is '-' character multiply the result by -1
    if (offset == 1)
        value *= -1;
    return value;
}

int charToInt(char character) {
    // Convert Character To Integer
    switch (character) {
        case '0':
```

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```
        return 0;
    case '1':
        return 1;
    case '2':
        return 2;
    case '3':
        return 3;
    case '4':
        return 4;
    case '5':
        return 5;
    case '6':
        return 6;
    case '7':
        return 7;
    case '8':
        return 8;
    case '9':
        return 9;
    default:
        return -1;
    }
    return -1;
}
```