10802 CPP Midterm Exam

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Subject：Array to integer

Main testing concept：

Basics		Functions	
■	C++ BASICS 1	□	SEPARATE COMPILATION AND NAMESPACES
□	FLOW OF CONTROL	□	STREAMS AND FILE I/O
■	FUNCTION BASICS	□	RECURSION
□	PARAMETERS AND OVERLOADING	□	INHERITANCE
□	ARRAYS	□	POLYMORPHISM AND VIRTUAL FUNCTIONS
■	STRUCTURES AND CLASSES	□	TEMPLATES
□	CONSTRUCTORS AND OTHER TOOLS	□	LINKED DATA STRUCTURES
□	OPERATOR OVERLOADING, FRIENDS,AND REFERENCES	□	EXCEPTION HANDLING
■	STRINGS	□	STANDARD TEMPLATE LIBRARY
□	POINTERS AND DYNAMIC ARRAYS	□	PATTERNS AND UML

Description：

In this task, you must write a class to convert a string into an integer. For example, with the given string "1234", this class should be able to convert it into a integer 1234. Although there are built-in functions of “atoi” in the <cstring> library and the “stringstream” class which achieve the same conversion, this task require to write your own code to achieve the same goal.

Please implement a class named **Atoi** to convert a string to an integer, and the following lists out the requirement of the class.

- The class Atoi has a data member **beConverted** in the type of std::string to store the original string value.
- The class Atoi has two constructors:
  - **Atoi()**: Construct a class Atoi and set its member **beConverted** to "".
  - **Atoi(std::string s)**: Construct a class Atoi and set its member **beConverted** to **s**.
- You should also implement the following member functions:
  - **void SetString(std::string s)**: Set the member **beConverted** to **s**.
  - **std::string GetString()**: Return the member **beConverted**.
  - **Int Length()**: Return the length of the digits in member **beConverted**.
  - **bool IsDigit()**: Return true if the member **beConverted** can be converted into an integer, or return false otherwise.
  - **int StringToInteger()**: Convert the member **beConverted** to an integer and return.

Input：

A series of string.

**The main() function in your submission will be replaced when judging.

**The sample main() function is in "Other Notes" section below, please copy it as your main

function to test your program.

Output：

The result of executing your program with the given main function.

Sample Input / Output :

Sample Input	Sample Output
05 11 23 -10 -11 8946 1891231	4 520 0520 4 2 5 05 4 4 1120 1120 4 2 11 11 4 4 2320 2320 4 2 23 23 4 4 -1020 1020 4 2 -10 10 4 4 -1120 1120

	4 2 -11 11 4 6 894620 894620 4 4 8946 8946 4 9 189123120 189123120 4 7 1891231 1891231 4
46506 -096504 56400 00494	7 4650620 4650620 4 5 46506 46506 4 8 -9650420 09650420 4 6 -96504 096504 4 7 5640020 5640020 4 5 56400

	56400 4 7 49420 0049420 4 5 494 00494 4

■ **Easy, only basic programming syntax and structure are required.**

□ **Medium, multiple programming grammars and structures are required.**

□ **Hard, need to use multiple program structures or complex data types.**

Expected solving time:

10 minutes

Other notes：

```
int main() {
	string beConverted;

	while (cin >> beConverted) {
		Atoi atoi(beConverted + "20");
		if (atoi.IsDigital()) {
			cout << atoi.Length() << endl;
			cout << atoi.StringToInteger() << endl;
			cout << atoi.GetString() << endl;
			cout << sizeof(atoi.StringToInteger()) << endl;
		}

		atoi.SetString(beConverted);
		if (atoi.IsDigital()) {
			cout << atoi.Length() << endl;
			cout << atoi.StringToInteger() << endl;
			cout << atoi.GetString() << endl;
			cout << sizeof(atoi.StringToInteger()) << endl;
		}
	}

	return 0;
}
```