String Streams

The string stream family lets us store and manipulate strings.

WE'LL COVER THE FOLLOWING

Streams

A stream is an infinite data stream on which we can push or pull data. String streams and file streams enable strings and files to interact with the stream directly.

String streams

String streams need the header `<sstream>`. They are not connected to an input or output stream and store their data in a string.

Whether we use a string stream for input, or output or with the character type `char` or `wchar_t` there are various string stream classes:

Class	Use
`std::istringstream` and `std::wistringstream`	String stream for the input of data of type `char` and `wchar_t`.
`std::ostringstream` and `std::wostringstream`	String stream for the output of data of type `char` and `wchar_t`.
`std::stringstream` and	String stream for the input or output of data of type `char` and

`std::wstringstream`	`wchar_t`.

Typical operations on a string stream are to:

- Write data to a string stream:

```
std::stringstream os;
os << "New String";
os.str("Another new String");
```

- Read data from a string stream:

```
std::stringstream os;
std::string str;
os >> str;
str= os.str();
```

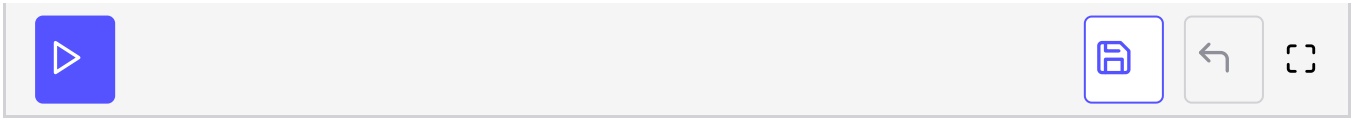
- Clear a string stream:

```
std::stringstream os;
os.str("");
```

String streams are often used for the type-safe conversion between strings and numeric values:

```
#include <iomanip>
#include <iostream>
#include <sstream>
#include <string>

template < class T >
T StringTo ( const std::string& source ){

  std::istringstream iss(source);
  T ret;
  iss >> ret;

  return ret;

}

template< class T >
std::string ToString(const T& n){

  std::ostringstream tmp ;
  tmp << n;
  return tmp.str();

}
```

```
int main(){

  std::cout << std::endl;

  std::cout << "5 = "  << std::string("5") << std::endl;
  std::cout << "5 = " <<  StringTo<int>("5") << std::endl;
  std::cout << "5 + 6 = " << StringTo<int>("5") + 6 << std::endl;

  std::string erg(ToString(StringTo<int> ("5") + 6 ) );
  std::cout << "5 + 6 = " << erg  << std::endl;

  std::cout << "5e10: " << std::fixed << StringTo<double>("5e10")  << std::endl;

  std::cout << std::endl;

}
```



String Streams

In the next lesson, we'll learn how to communicate with files using C++.