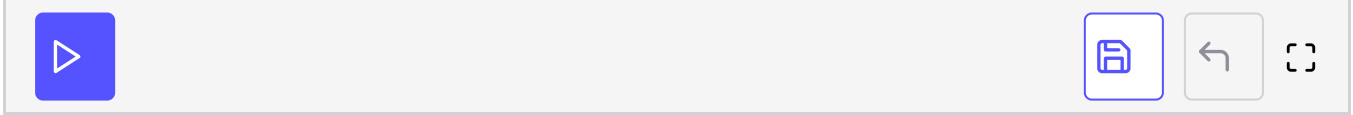
std::ref and std::cref

In the last lesson, we were introduced to reference wrappers. Now, we will learn how to create them.

With the helper functions `std::ref` and `std::cref` you can easily create reference wrappers to variables. `std::ref` will create a non constant reference wrapper, `std::cref` a constant one:

```
// referenceWrapperRefCref.cpp
#include <iostream>
#include <functional>

void invokeMe(const std::string& s){
  std::cout << s << ": const " << std::endl;
}

template <typename T>
  void doubleMe(T t){
  t*= 2;
}

int main(){
  std::string s{"string"};

  invokeMe(std::cref(s));        // string

  int i= 1;
  std::cout << i << std::endl;   // 1

  doubleMe(i);
  std::cout << i << std::endl;   // 1S

  doubleMe(std::ref(i));
  std::cout << i << std::endl;   // 2

  return 0;
}
```



The helper functions `std::ref` and `std::cref`

So it's possible to invoke the function `invokeMe`, which gets a constant reference to an `std::string`, with a non-constant `std::string s`, which is

wrapped in a `std::cref(s)`. If I wrap the variable `i` in the helper function

`std::ref`, the function template `doubleMe` will be invoked with a reference. So the variable `i` will be doubled.

In the next lesson, let's talk about smart pointers in C++.