- Example

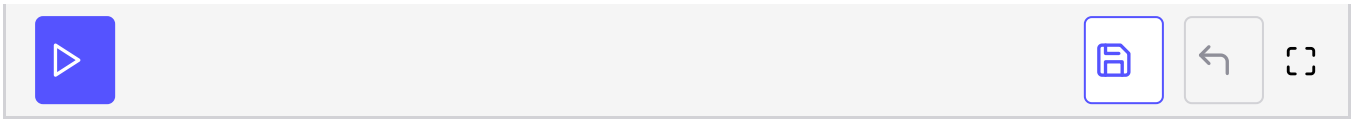
As compared to the std::shared_ptr, std::weak_ptr does not change the reference counter of the shared variable. Let's take a look at this feature in the example below.

WE'LL COVER THE FOLLOWING

Example

```
// weakPtr.cpp

#include <iostream>
#include <memory>

int main(){

  std::cout << std::boolalpha << std::endl;

  auto sharedPtr=std::make_shared<int>(2011);
  std::weak_ptr<int> weakPtr(sharedPtr);

  std::cout << "weakPtr.use_count(): " << weakPtr.use_count() << std::endl;
  std::cout << "sharedPtr.use_count(): " << sharedPtr.use_count() << std::endl;
  std::cout << "weakPtr.expired(): " << weakPtr.expired() << std::endl;

  if( std::shared_ptr<int> sharedPtr1 = weakPtr.lock() ) {
    std::cout << "*sharedPtr: " << *sharedPtr << std::endl;
    std::cout << "sharedPtr1.use_count(): " << sharedPtr1.use_count() << std::endl;
  }
  else{
    std::cout << "Don't get the resource!" << std::endl;
  }

  weakPtr.reset();
  if( std::shared_ptr<int> sharedPtr1 = weakPtr.lock() ) {
    std::cout << "*sharedPtr: " << *sharedPtr << std::endl;
    std::cout << "sharedPtr1.use_count(): " << sharedPtr1.use_count() << std::endl;
  }
  else{
    std::cout << "Don't get the resource!" << std::endl;
  }

  std::cout << std::endl;
```

```
}
```



Explanation

- In line 11, we create an `std::weak_ptr` that borrows the resource from the `std::shared_ptr`.
- The output of the program shows that the reference counter is 1 (line 13 and 14), meaning that `std::weak` does not increment the counter.
- The call `weakPtr.expired()` checks if the resource was already deleted. That is equivalent to the expression `weakPtr.use_count() == 0`.
- If the `std::weak_ptr` shared a resource, we could use `weakPtr.lock()` at line 17 to create an `std::shared_ptr` out of it.
- The reference counter will now be increased to 2 (line 18). After resetting the `weakPtr` (line 25), the call `weakPtr.lock()` fails.

That was almost the whole story for the `std::weak_ptr`. Almost, because the `std::weak_ptr` has a special job: it helps to break the cyclic references of `std::shared_ptr`.

In the next lesson, we will take a look at the issue of cyclic references while using `std::shared_ptr`.