## Cyclic References

In this lesson, we'll examine how the use of shared pointers can create a reference cycle and why this could be harmful.

WE'LL COVER THE FOLLOWING ^

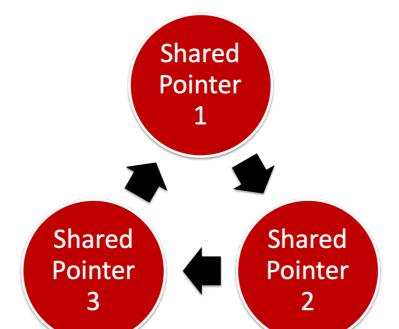
The issue

We get **cyclic references** of **std::shared\_ptr** if they refer to each other.

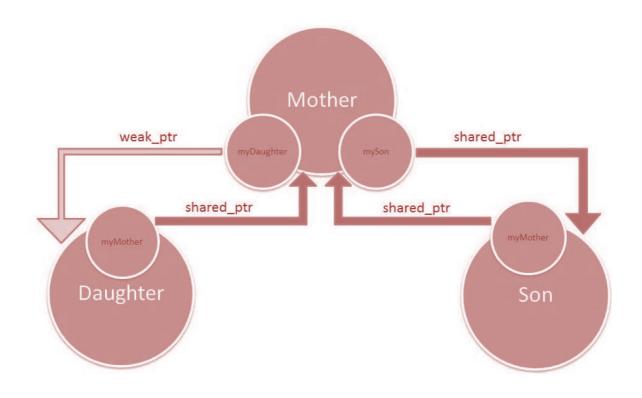
## The issue #

If we have a cyclic reference of std::shared\_ptr, the reference counter will
never become 0. We can break this cycle if by embedding an std::weak\_ptr in
the cycle. std::weak\_ptr does not modify the reference counter.

Theoretically, we can use a raw pointer to break the cycle of std::shared\_ptr 's, but a raw pointer has two disadvantages. First, they
don't have a well-defined interface. Second, they don't support an
interface that can create an std::shared\_ptr out of it.



There are two cycles in the graphic below: first, between the mother and her daughter; second, between the mother and her son. The subtle difference is that the mother references her daughter with an <a href="mailto:std::weak\_ptr">std::weak\_ptr</a>. Therefore, the <a href="mailto:std::shared\_ptr">std::shared\_ptr</a> cycle is broken.



To better understand, take a look at the corresponding source code in the example in the following lesson.