

Parallel Calculations

Now, it's time to refactor the `CalcTotalOrder` function using parallel algorithms.

WE'LL COVER THE FOLLOWING



- Arithmetic Operations in Parallel Algorithms

Arithmetic Operations in Parallel Algorithms

Another place where we can use parallel algorithms is `CalcTotalOrder()`.

Instead of `std::accumulate` we can use `std::transform_reduce`.

As mentioned in the [Parallel Algorithms](#) chapter, the floating point sum operation is not associative. However, in our case, the results should be stable enough to give 2 decimal places of precision. If you need better accuracy and numerical stability, please consider using a different method.

```
double CalcTotalOrder(const std::vector<OrderRecord>& records,
                     const Date& startDate, const Date& endDate)
{
    return std::transform_reduce(
        std::execution::par,
        std::begin(records), std::end(records),
        0.0,
        std::plus<>(),
        [&startDate, &endDate](const OrderRecord& rec) {
            if (rec.CheckDate(startDate, endDate))
                return rec.CalcRecordPrice();

            return 0.0;
        });
}
```



We use the `transform` step of `std::transform_reduce` to “extract” values to sum. We cannot easily use `std::reduce` as it would require us to write a reduction operation that works with two `OrderRecord` objects.

Let's test.