# Introduction

An introduction to a problem of calculating the sum of a vector, and how to solve it through various methods in C++.

WE'LL COVER THE FOLLOWING


- Calculating the Sum of a Vector


After providing the theory on the memory model and the multithreading interface, I will now apply the theory in practice and provide you a few performance numbers.

## Calculating the Sum of a Vector #

What is the fastest way to add the elements of a `std::vector`? To get the answer, I will fill a `std::vector` with one hundred million arbitrary but uniformly distributed numbers between 1 and 10. The task is to calculate the sum of the numbers in various ways; I use the performance of a single threaded addition as the reference execution time. In this chapter, I will also discuss atomics, locks, thread local data, and tasks.

Let's start with the single-threaded scenario in the next lesson.