

Arguments of Threads - Race Conditions and Locks

This lesson defines race conditions, and explains how to address them in concurrent programming with C++

Both issues from the previous lesson are actually **race conditions** because the result of the program depends on the interleaving of the operations. The race condition is the cause of the data race.

Fixing the data race is quite easy; **valSleeper** should be protected using either a **lock** or an **atomic**. To overcome the lifetime issues of **valSleeper** and **std::cout**, you have to join the thread instead of detaching it.

Here is the modified main function.

```
#include <chrono>
#include <iostream>
#include <thread>

class Sleeper{
public:
    Sleeper(int& i_):i{i_}{};
    void operator() (int k){
        for (unsigned int j= 0; j <= 5; ++j){
            std::this_thread::sleep_for(std::chrono::milliseconds(100));
            i += k;
        }
        std::cout << std::this_thread::get_id() << std::endl;
    }
private:
    int& i;
};

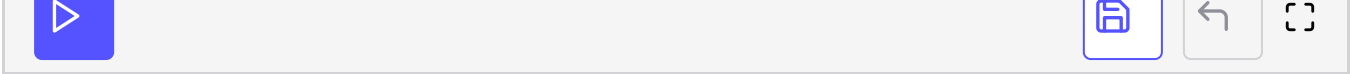
int main(){

    std::cout << std::endl;

    int valSleeper= 1000;
    std::thread t(Sleeper(valSleeper),5);
    t.join();
    std::cout << "valSleeper = " << valSleeper << std::endl;

    std::cout << std::endl;

}
```



Now we get the right result; of course the execution becomes slower.