## - Exercises

In this exercise, you will spot a data race and synchronize the code.

```
we'll cover the following ^
Task 1
Task 2
```

## Task 1#

In the code below, vary the sleep time of **Sleeper** to prevent undefined behavior.

Variation in the runtime with no synchronization results in undefined behavior.

The program has one serious issue: it has a data race and, therefore, undefined behavior. In simple words, a data race is a situation in which you have concurrent, non-synchronized read and write access to data. Do you spot the data race?

```
// threadArguments.cpp
#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();
    }
    private:</pre>
```

```
int& i;
};

int main(){

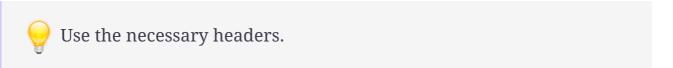
std::cout << std::endl;

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

std::cout << std::endl;
}</pre>
```

## Task 2 #

Get the std::thread::hardware\_concurrency() onto your system.





The solutions to these tasks can be found in the next lesson.