Integer Operations and Threads Solutions

Integer Operations and Threads

- Write a program which runs the task function shown on the next slide as 10 concurrent threads

- Briefly explain your results
  - A data race occurs, because multiple threads access the count variable, at least one thread modifies it, and there is no "happens before" relationship between the thread accesses
  - Even though incrementing an integer is an uninterruptible operation, the value of the variable needs to be fetched from RAM and stored there, and threads can be interrupted between these operations
  - This causes threads to interfere with each other when accessing the count variable, which causes the answer to be wrong

- Rewrite the program to use a mutex to protect the count variable

Integer Operations and Threads

```cpp
int counter {0};

void task() {
    for (int i = 0; i < 100'000; ++i)
        ++counter;
}
```