Dynamic analysis is a technique used to analyse the behaviour of programs, which can be utilized when searching for various software errors. Nowadays, there is a trend in software development towards multi-threaded programs that are, undeniably, prone to race conditions. Furthermore, software errors that stem from timing issues and incorrect ordering of operations across individual threads are generally hard to find, since they are by nature non-deterministic. We decided to implement a dynamic analysis framework for C# programs, along with two well-known algorithms capable of detecting and predicting data-races. As a result, we created an extensible and configurable tool, SharpDetect, that supports dynamic analysis of CIL programs created by compilation from C# source code on platforms supported by .NET Core. To demonstrate its practical usefulness, SharpDetect was successfully applied on NetMQ, C# implementation of ZeroMQ, where it found one real software error.