# ClrMD workshop – Lab 4 | Look into concurrent data structures

The goal of this lab is to use DynaMD nuget to more easily navigate in fields, arrays and collections.

1. Open Lab4 solution and run SampleApp: you get the syntax to copy and paste into a command line prompt and get a dump of the application

2. Open the dump with WinDBG to explore the ConcurrentDictionary and ConcurrentQueue data structures

3. !dumpheap -stat to get the instances count grouped by type

For dictionary
1. Click the MT to get the list of instances (should be 4)
2. Click one of them and take a look at the implementation
    1. m_tables → m_buckets is an array that contains the key/value pairs we are interested in
    2. Dump m_key and m_value

For queue
1. Click the MT to get the list of instances (should be 2)
2. Click one of them and take a look at the implementation
    1. Chained list of Segment starting from m_head
    2. A Segment stores the elements in m_array from m_low up to m_high

*Lab*

1. Write the code to list all ConcurrentDictionary<int, string> instances with their key/value pairs

2. Write the code to list all ConcurrentQueue<int> instances with the values they are containing