

C# IDisposable

C# [IDisposable](#)

C#IDisposable C# "" Java [Closeable](#) "" Dispose Close"""" close ;-)

JavaC# Java C# IDisposable Java Closeable .NET IDisposable Roslyn IDisposable "" IDisposable

IDisposable

[Roslyn](#) "" Disposable Dispose ""[CA2213](#)"" disposable IDisposable ""[CA1001](#)

C# [ManualResetEvent](#), [Semaphore](#), [ReaderWriterLockSlim](#) IDisposable "" Dispose "" GC

```
void foo()
{
    var event = new ManualResetEvent(false);
    // _event ...
    event.Dispose();
}
```

Dispose Dispose Dispose

C free free free C

```
void main()
{
    int *a = malloc(sizeof(int));
    *a = 1;

    int *b = malloc(sizeof(int));
    *b = 2;

    free(a);

    int *c = malloc(sizeof(int));
    *c = 3;

    printf("%d, %d, %d\n", *a, *b, *c);
}
```

""

C# GCIDisposable Java

Java [Closeable](#) Java [Semaphore](#) Closeable Close Dispose C# Semaphore ""

.NET IDisposable

C# IDisposable JetBrains [dotPeek](#) .NET IDisposable .NET IDisposable

HashAlgorithm SHA MemoryStream HashAlgorithm Dispose

```
public abstract class HashAlgorithm : IDisposable, ICryptoTransform {
    ...
    protected internal byte[] HashValue;
    ...
    protected virtual void Dispose(bool disposing)
    {
        if (disposing)
        {
            if (HashValue != null)
                Array.Clear(HashValue, 0, HashValue.Length);
            HashValue = null;
            m_bDisposed = true;
        }
    }
}
```

HashValue null Dispose null IDisposable null C free C# null

```
void foo()
{
    BigObject x = new BigObject();
    // ...
    // x ...
    // ...
    x = null;
}
```

x = null GC null null HashAlgorithm HashValue ComputeHash() HashAlgorithm HashValue
thread safe

C# GC Dispose null GC

```
class Foo : IDisposable
{
    private byte[] _data = new byte[1000000000];

    public void Dispose()
    {
        _data = null;    //
    }
}
```

Foo Dispose _data null Foo

```
void UseFoo()
{
    Foo foo = new Foo();
    // f...
    foo.Dispose(); //
    foo = null;    //
}
```

foo.Dispose() foo = null foo foo GC Foo

Dispose IDisposable Foo GC Dispose Foo Foo Foo GC _data

Dispose Dispose null HashAlgorithm "" Dispose IDisposable ""

HashAlgorithm IDisposable IDisposable""

MemoryStream Dispose

```
protected override void Dispose(bool disposing)
{
    try
    {
        if (disposing)
        {
            _isOpen = false;
            _writable = false;
            _expandable = false;
#if FEATURE_ASYNC_IO
            _lastReadTask = null;
#endif
        }
    }
    finally
    {
        // Call base.Close() to cleanup async IO resources
        base.Dispose(disposing);
    }
}
```

AutoResetEventManualResetEventReaderWriterLockSlimSemaphore IDisposable "" Windows event
SafeHandleSafeHandle ""finalizer

```
~SafeHandle()
{
    Dispose(false);
}
```

SafeHandle GC GC Dispose ManualResetEvent, Semaphore Dispose GC GC

```
" GC IDisposable IDisposable GC " IDisposable
IDisposable GC """"
"" thread safe ""
GC """"
""
```

C# ManualResetEvent, Semaphore, ReaderWriterLockSlim IDisposable GC Dispose Dispose

Roslyn

Roslyn Dispose Roslyn Roslyn Dispose flow analysis false positive PySonar Coverity ;-)

Roslyn [CA1001](#) "Types that own disposable fields should be disposable" "" IDispoable IDisposable
IDisposable ManualResetEvent IDisposable Dispose