Introduction to .NET

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Agenda

- Unit testing – shortcut to expert level
- Entity Framework Core – part1

Unit testing – shortcut to expert level

Unit testing – shortcut to expert level

- Why unit testing?
    - Benefits of unit tests
- What is a unit test?
- Unit test life cycle
- What makes a good unit test?
- Best practices

Why unit testing?

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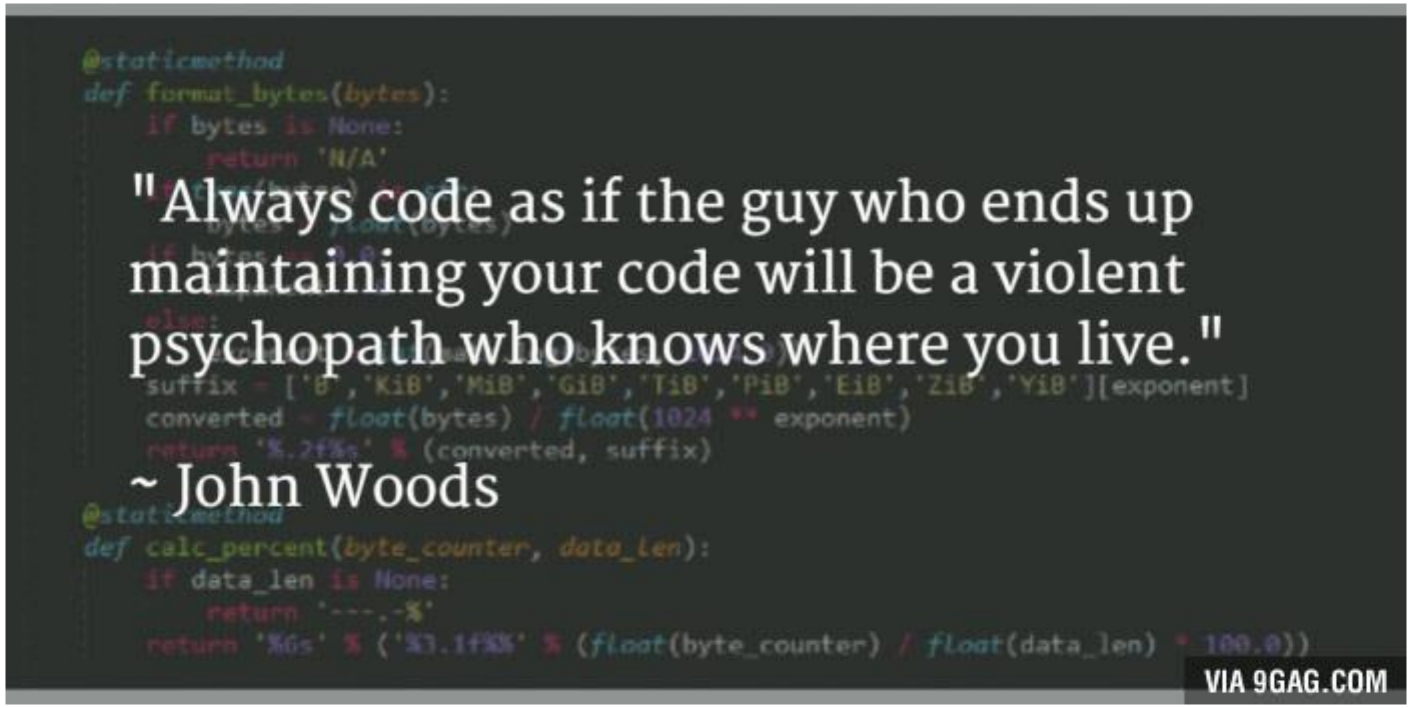
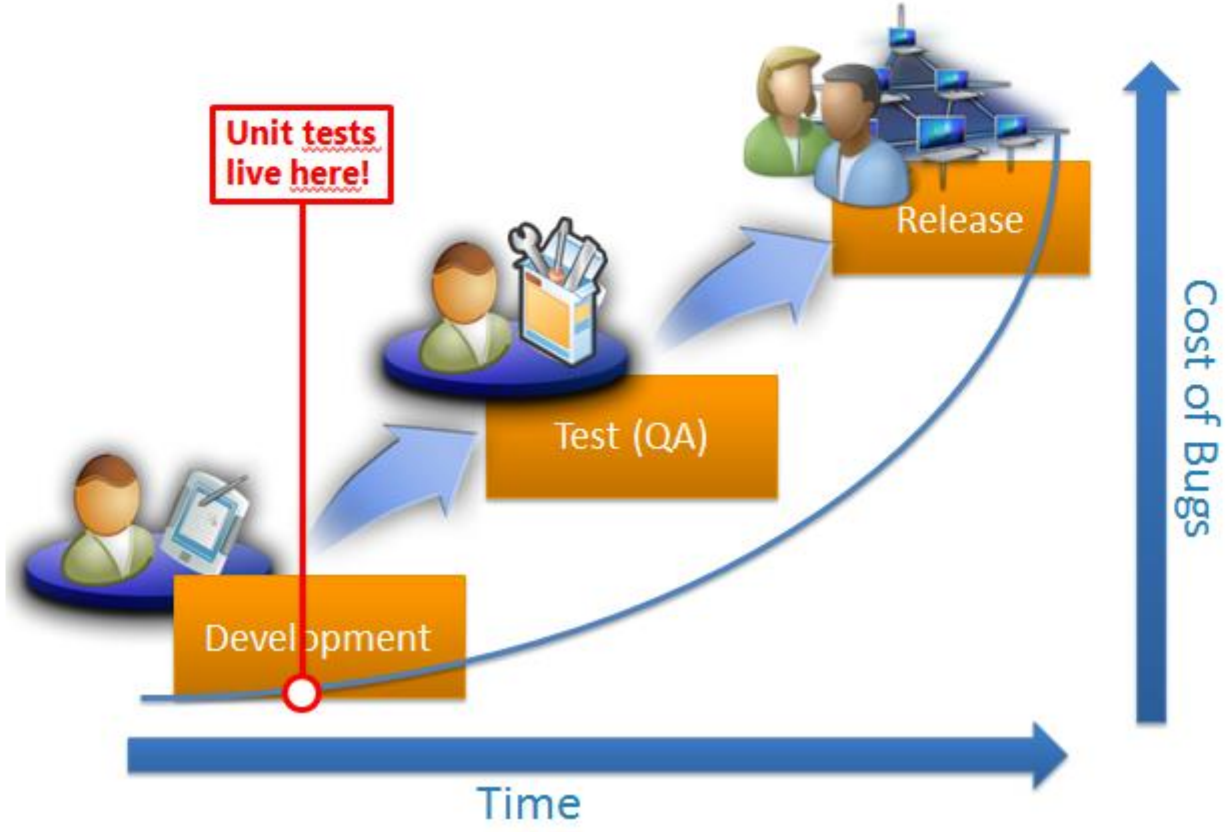


"Always code as if the guy who ends up maintaining your code will be a violent psychopath who knows where you live."

~ John Woods

VIA 9GAG.COM

Why unit testing?



Why unit testing?

- Benefits of unit testing
  - Find defects early
  - Prevent regressions
  - Provide living documentation (source code)
  - Automate testing efforts

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Requires tests to be as complete as possible and to be run as early and often as possible

What is a Unit Test?

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- Definition 1

What is a Unit Test?

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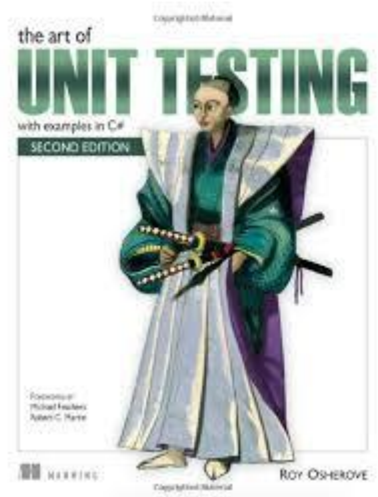
- "A unit test is a piece of code (usually a method) that invoke another piece of code and checks the correctness of some assumptions afterwards."
  - "The art of unit testing"



What is a Unit Test?

- Definition 2

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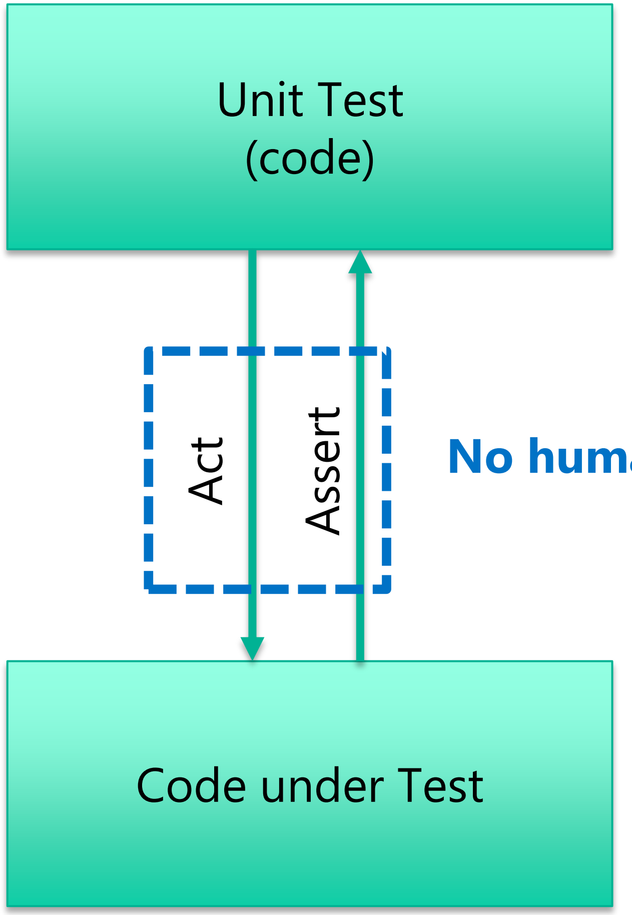
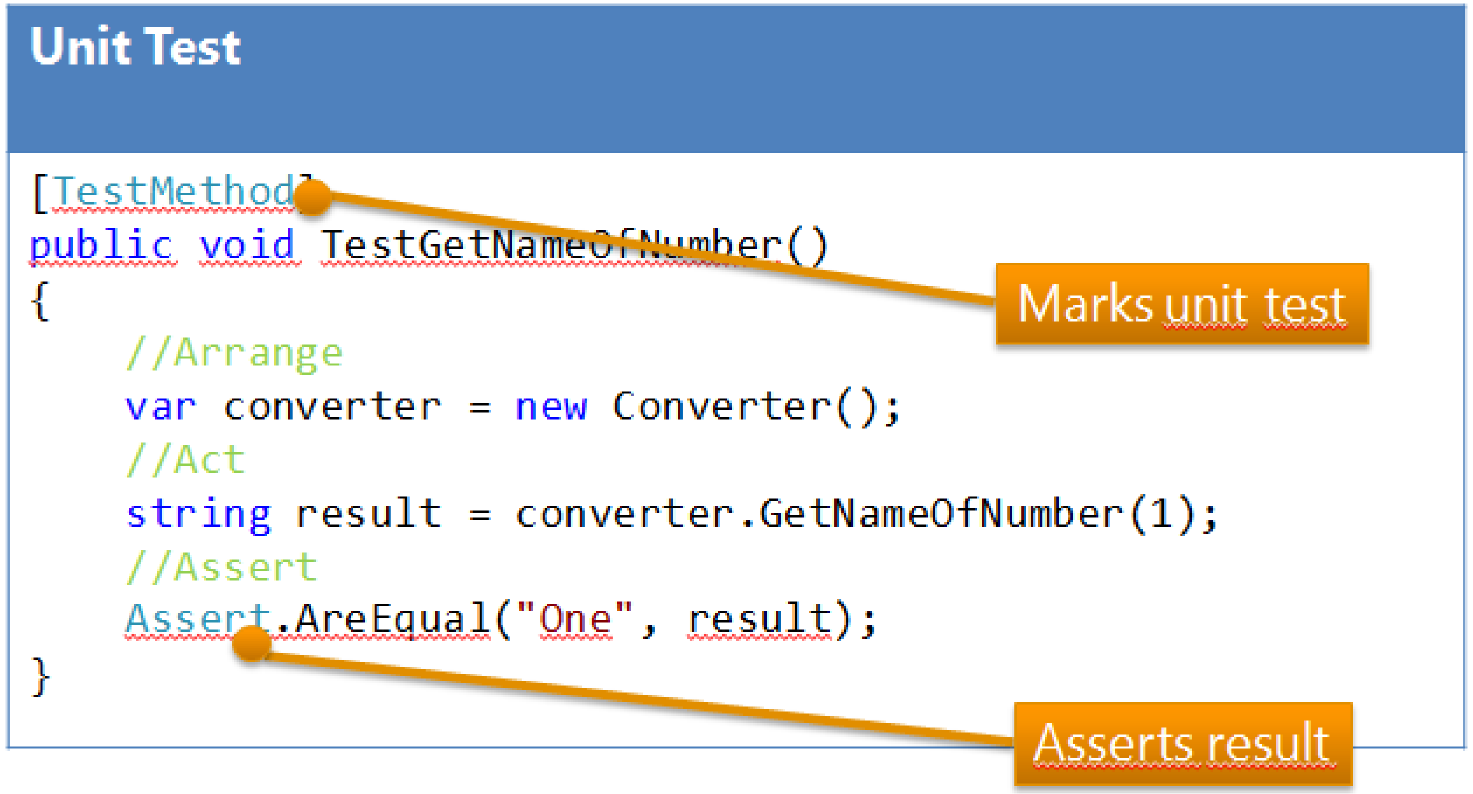
- **Essentially**, a unit test is a method that instantiates a small portion of our application and verifies its behavior **independently from other parts.**

Unit test representation



No human interaction!

Unit test example



Unit Test

```
[TestMethod]
public void TestGetNameOfNumber()
{
    //Arrange
    var converter = new Converter();
    //Act
    string result = converter.GetNameOfNumber(1);
    //Assert
    Assert.AreEqual("One", result);
}
```

What Makes a Good Unit Test?

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- Easy to write

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- Easy to write
- Readable

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- Easy to write
- Readable
- Reliable

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- Easy to write
- Readable
- Reliable
- Fast

Best practices

- A test should be:

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- A test should be:
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  - Test Only One Condition at a Time

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Best practices

- A test should be:
  - Isolated
  - Test Only One Condition at a Time
  - Repeatable
  - Thorough
  - Mock external references

Unit test life cycle

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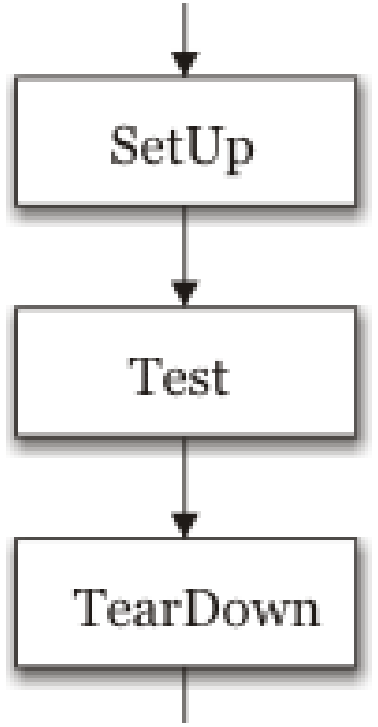
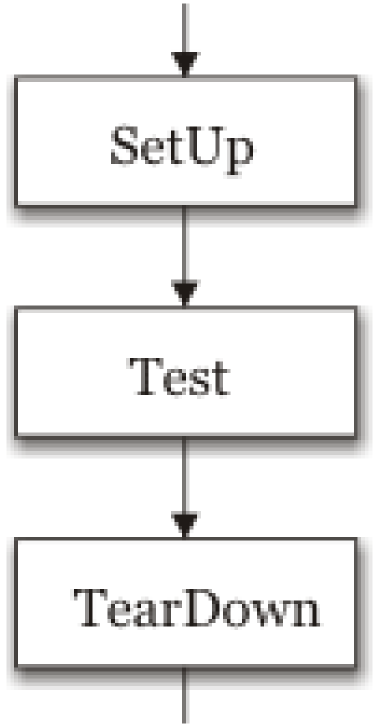
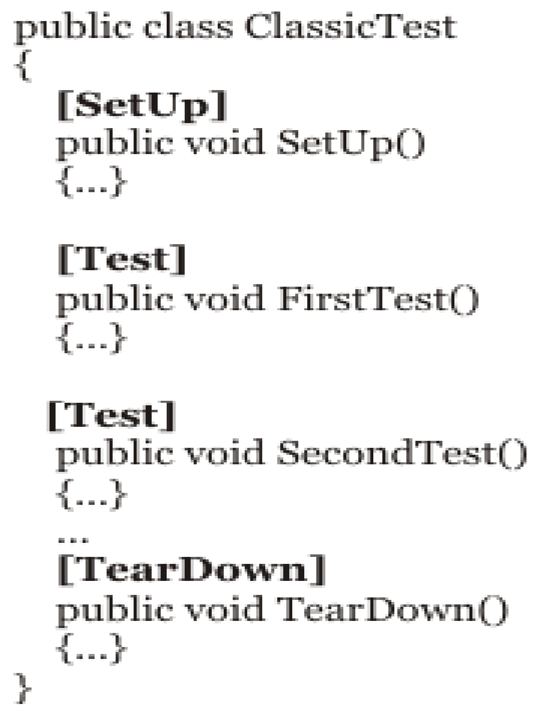


Unit test life cycle





```
public class ClassicTest
{
   [SetUp]
   public void SetUp()
   {...}

   [Test]
   public void FirstTest()
   {...}

  [Test]
   public void SecondTest()
   {...}
   ...
   [TearDown]
   public void TearDown()
   {...}
}
```

Entity Framework Core - part1

Entity Framework Core – part1

- Introduction in Entity Framework
- Entity Framework code first
  - Conventions
  - Attributes
  - Fluent API
  - Creating models with Entity Framework code first/Creating Context class with Entity Framework – from scratch sample
  - Transactions
  - Manipulating data(Inserting entities, Updating entities, Deleting entities, querying entities)

Introduction in Entity Framework

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- What is Entity Framework?
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- Pros/Cons in using EF Core

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It is an ORM => object relational mapping tool from Microsoft.

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Was first released as part of .NET Framework 3.5 with Service Pack 1 back in late 2008.

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The version included with Visual Studio 2015 is Entity Framework 6.1.3 (EF6).

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It is mature, stable, and supports the "old" EDMX design-time way

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Supports modern cloud-based, non-relational databases(Azure Table Storage, Redis)	Does not support yet complex inheritance models
Tip: Use EF6 for Windows platform applications until EF Core becomes more stable and implements more features. Use EF Core for cross-platform development.	

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- The string .NET type is assumed to be an nvarchar type in the database.
- The int .NET type is assumed to be an int type in the database.
- A property that is named ID or the name of the class has ID as the suffix, it is assumed to be a primary key. If this property is any integer type or the Guid type, then it is also assumed to be an IDENTITY

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```
[Required]
[StringLength(40)]
public string CustomerName { get; set; }
```

or:

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```
[Required]
[StringLength(40)]
public string CustomerName { get; set; }
```

or:

```
[Column( TypeName = "money")]
public decimal? UnitPrice { get; set; }
```

Entity Framework code first Fluent API

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```
[Required]
[StringLength( 40)]
public string CompanyName { get; set; }
```

They could be deleted and replaced with this Fluent API statement in the Context class OnModelBuilding method:

```
modelBuilder.Entity<Customer>()
.Property(customer=>customer.CompanyName)
.IsRequired()
.HasMaxLength(40);
```

Entity Framework code first – models and context class

- Creating models with Entity Framework code first/Creating Context class with Entity Framework – from scratch sample - Demo

Entity Framework code first transactions

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  - D: is for durable

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Entity Framework code first manipulating data

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- Up
- Del
- Qu

```
var newProduct = new Product
{
    ProductName = "Bob's Burger",
    UnitPrice = 500M
};
// mark product as added in change tracking
db.Products.Add(newProduct);
// save tracked changes to database
db.SaveChanges();
foreach (var item in query)
{
    WriteLine($"{item.ProductID}: {item.ProductName} costs
{item.UnitPrice:$#,##0.00}");
}
```

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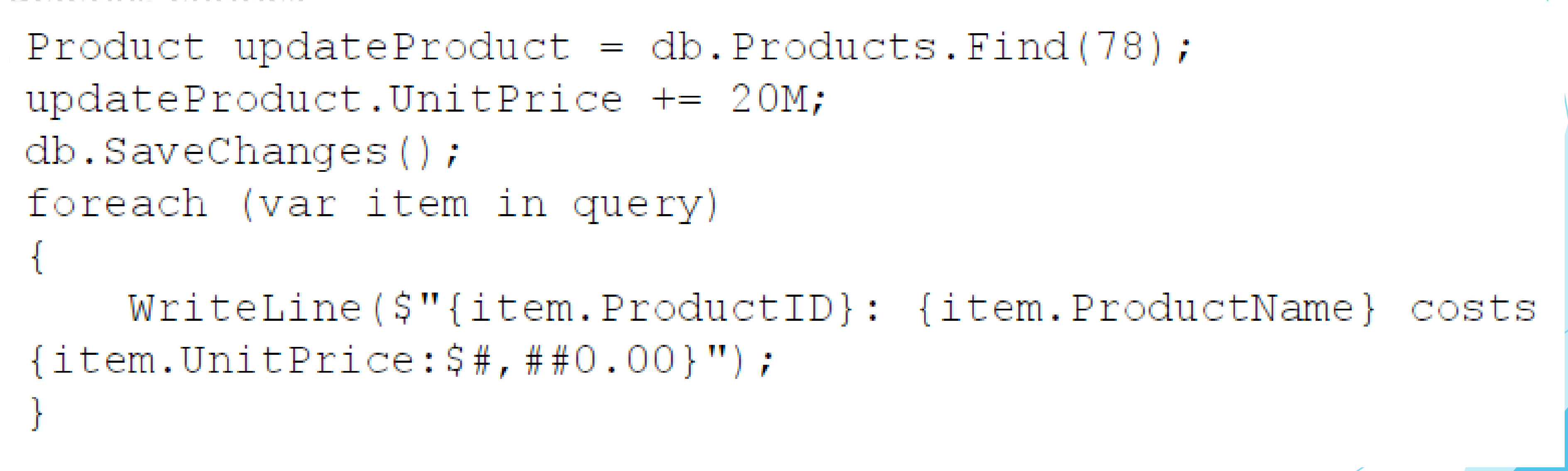
- 

```
Product updateProduct = db.Products.Find(78);
updateProduct.UnitPrice += 20M;
db.SaveChanges();
foreach (var item in query)
{
    WriteLine($"{item.ProductID}: {item.ProductName} costs
{item.UnitPrice:$#,##0.00}");
}
```

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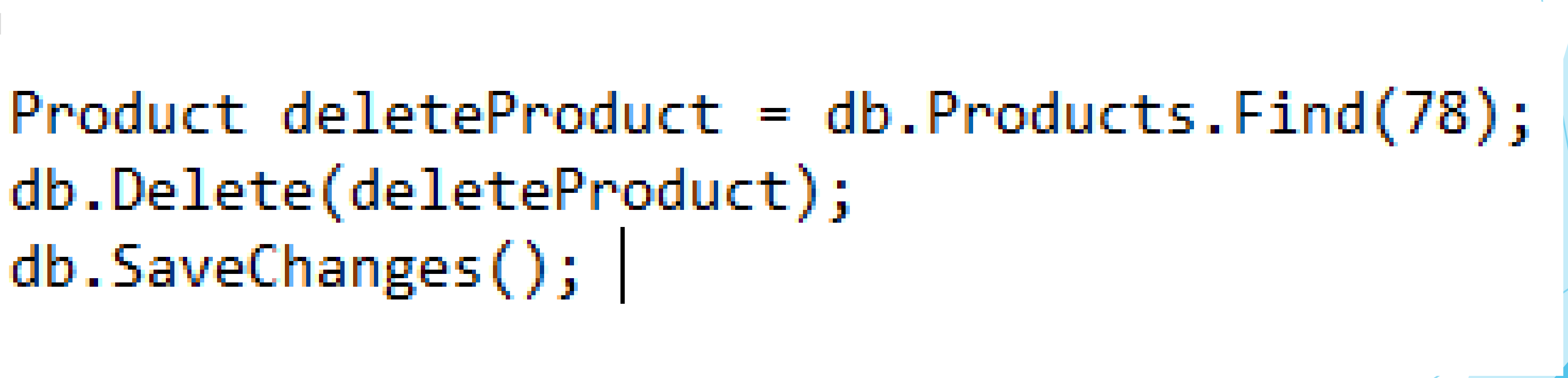

```
Product deleteProduct = db.Products.Find(78);
db.Delete(deleteProduct);
db.SaveChanges();
```

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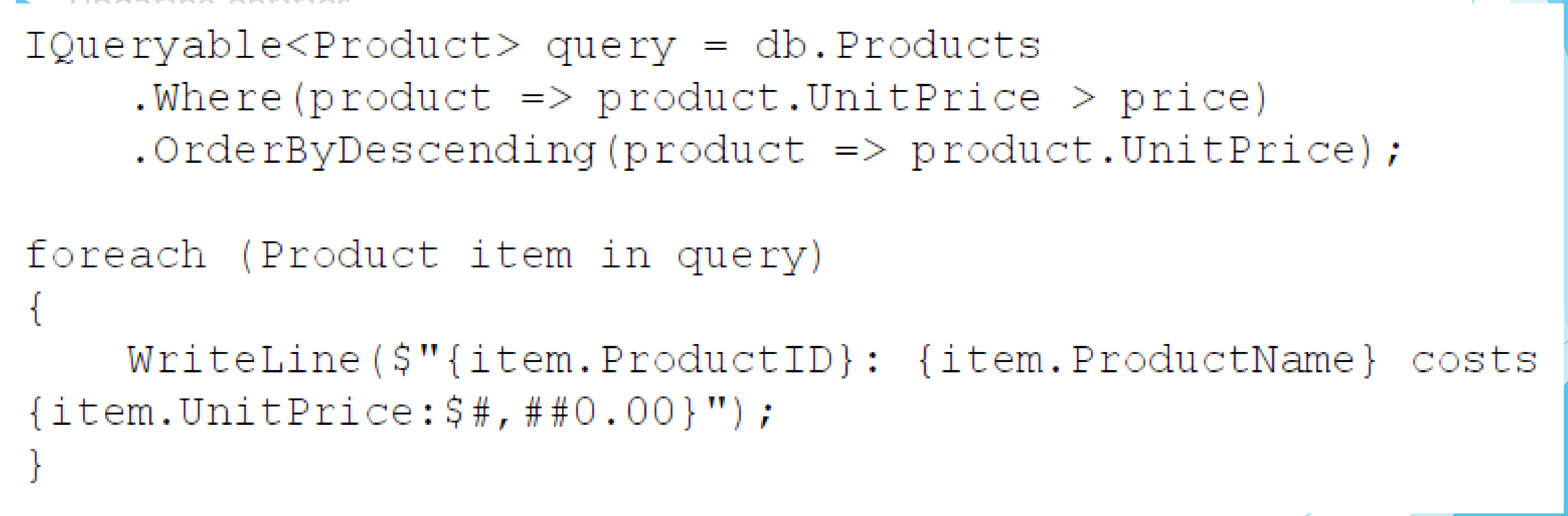
Entity Framework code first manipulating data

- Inserting entities



```
IQueryable<Product> query = db.Products
    .Where(product => product.UnitPrice > price)
    .OrderByDescending(product => product.UnitPrice);

foreach (Product item in query)
{
    WriteLine($"{item.ProductID}: {item.ProductName} costs
{item.UnitPrice:$#,##0.00}");
}
```

What’s next …

- Entity Framework Core – part 2

One more thing…

- *Read the story from notes!!!!!*

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Early one morning, a programmer asked the great master:

“I am ready to write some unit tests. What code coverage should I aim for?”

The great master replied:

“Don’t worry about coverage, just write some good tests.”

The programmer smiled, bowed, and left.

…

Questions

- Do you have any other questions?

Thanks!

See you next time! ☺