# Isolating code

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# Agenda

- Isolation Techniques
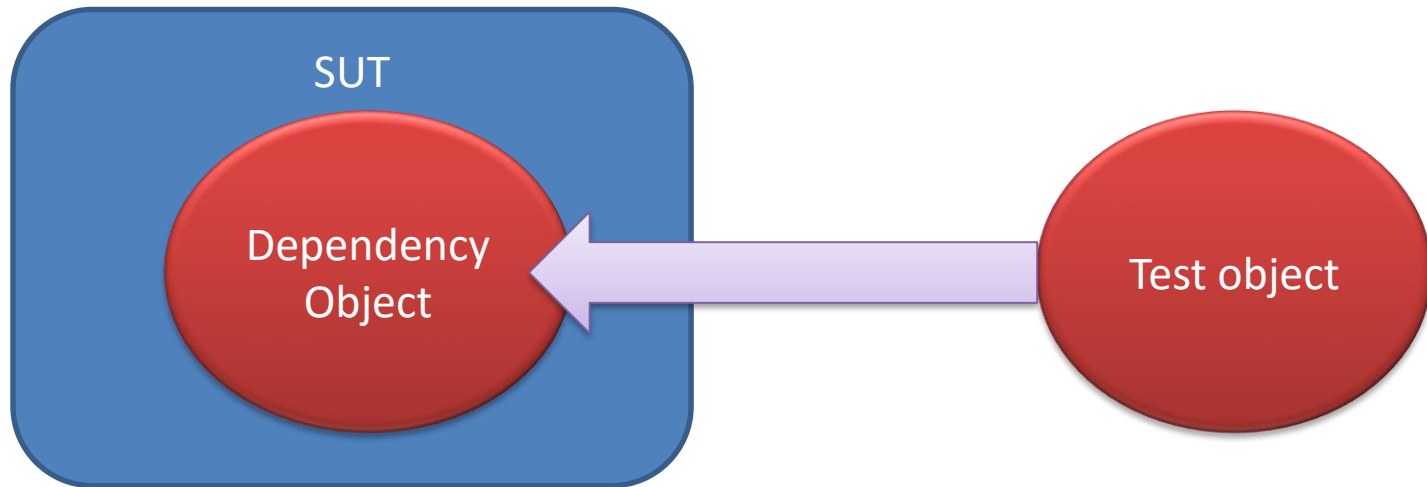- Test Doubles
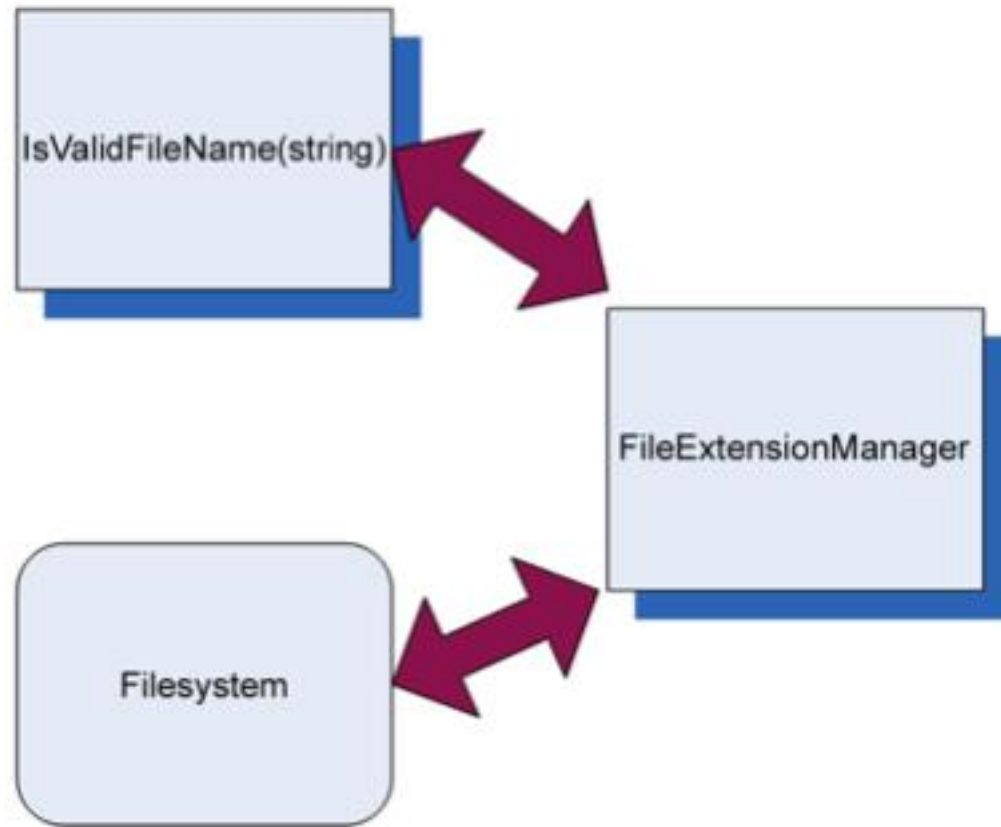- Isolation by example

# Isolation Techniques

# What is a dependency?

- An *external dependency* is an object in your system that your code under test interacts with and over which you have no control. (Common examples are file systems, threads, memory, time, and so on.)
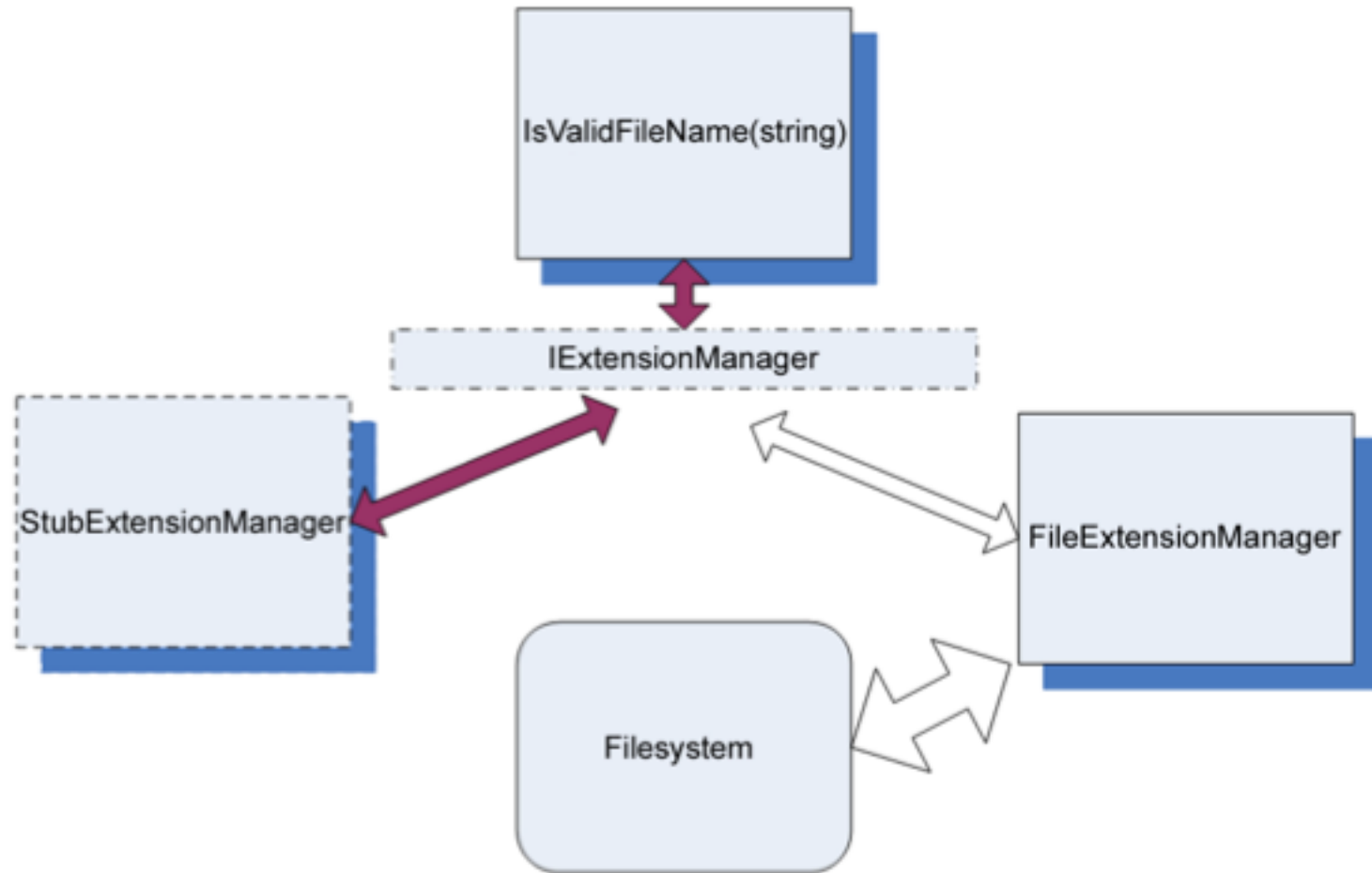
# Test method

# Case study

# Case study

# Faking out the SUT

**1. Create test-specific objects**

**THE TEST**

**2. Create the SUT**

- Provide needed test substitution objects

**3. Invoke operation on the SUT**

- Provide needed test substitution objects

**4. Check results o SUT invocation**

- On the SUT
- On the test substitution object

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# Test doubles

# Dummy

```
var order = new Order();
order.AddLineItem(12, 1);
order.AddLineItem.Add(21, 3);
Assert.AreEqual(2, order.NumLineItems);
```

```
var person = new Person();
person.First = "Homer";
person.Last = "Simpson";
Assert.IsNotNull(person.FullName);
```

# Stub

```
public class StubRepo : IOwnerRepository
{
    public IOwner FindById(int id){}

    public IOwner Save(IOwner owner)
    {
        return new Owner();
    }

    public void Delete(IOwner owner){}
}
```

# Fake

```csharp
public class FakeRepo : IOwnerRepository
{
    IList<IOwner> _owners = new List<IOwner>();
    int _idCounter = 0;

    public IOwner Save(IOwner owner)
    {
        owner.Id = _idCounter++;
        _owners.Add(owner);
        return owner;
    }

    public void Delete(IOwner owner)
    {
        var ownerToDelete = _owners.FirstOrDefault(o => o.Id == owner.Id);
        _owners.Remove(ownerToDelete);
    }
}
```

# Spy

```csharp
public class SpyDefaultView : IDefaultView
{
    public SpyDefaultView()
    {
        ShowWasCalled = false;
    }

    public void Show(DefaultVM model)
    {
        ShowWasCalled = true;
    }

    public void ShowError(string error){}

    public void Redirect(string url){}

    public bool ShowWasCalled { get; set; }
}
```
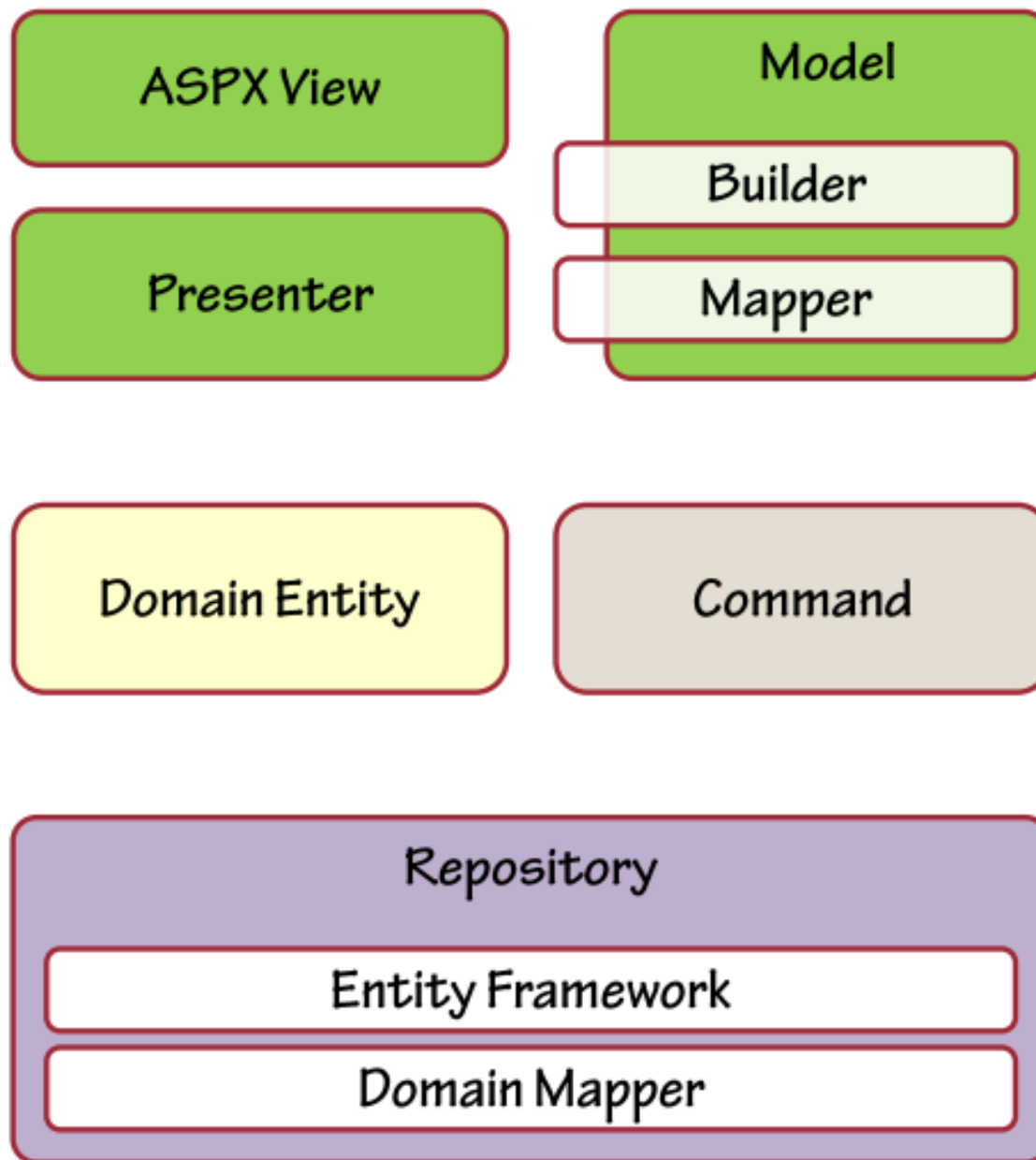
```csharp
Assert.IsTrue(spy.ShowWasCalled);
```

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# Mock

- TypeMock
- RhinoMOck
- MOQ

ASPX View

Model
- Builder
- Mapper

Presenter

Domain Entity

Command

Repository
- Entity Framework
- Domain Mapper

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# References

- xunitpatterns.com