**Player.cs**

using System;

using System.Collections;

using System.Collections.Generic;

using System.Linq;

using System.Xml.Linq;

namespace Iteration3

{

public class Player(string name, string desc) : GameObject(idents, name, desc)

{

private readonly Inventory \_inventory = new();

private static readonly string[] idents = ["me", "inventory"];

public GameObject Locate(string id)

{

if (AreYou(id))

{

return this;

}

return \_inventory.Fetch(id);

}

public override string FullDescription

{

get

{

return "You are " + Name + ", " + base.FullDescription + ".\nYou are carrying:\n" + \_inventory.ItemList;

}

}

public Inventory Inventory

{

get

{

return \_inventory;

}

}

}

}

**Bag.cs**

using System;

using System.Xml.Linq;

namespace Iteration3

{

public class Bag(string[] ids, string name, string desc) : Item(ids, name, desc)

{

private readonly Inventory \_inventory = new();

public Inventory Inventory

{

get

{

return \_inventory;

}

}

public GameObject Locate(string id)

{

if (this.AreYou(id))

{

return this;

}

else if (\_inventory.HasItem(id))

{

return \_inventory.Fetch(id);

}

return null;

}

public string FullBagDescription

{

get

{

string InventoryDescription = "In the " + Name + " you can see:\n";

InventoryDescription += \_inventory.ItemList;

return InventoryDescription;

}

}

}

}

**Items.cs**

using System;

using System.Collections.Generic;

using System.Text;

namespace Iteration3

{

public class Item(string[] idents, string name, string desc) : GameObject(idents, name, desc)

{

}

}

**Inventory.cs**

using System;

using System.Collections.Generic;

namespace Iteration3

{

public class Inventory

{

private readonly List<Item> \_items;

public Inventory()

{

\_items = [];

}

public bool HasItem(string id)

{

foreach (Item item in \_items)

{

if (item.AreYou(id))

{

return true;

}

}

return false;

}

public void Put(Item itm)

{

\_items.Add(itm);

}

public Item Fetch(string id)

{

foreach (Item item in \_items)

{

if (item.AreYou(id))

{

return item;

}

}

return null;

}

public Item Take(string id)

{

Item takeitem = Fetch(id);

\_items.Remove(takeitem);

return takeitem;

}

public string ItemList

{

get

{

string list = "";

foreach (Item item in \_items)

{

list += "\t" + item.ShortDescription + "\n";

}

return list;

}

}

}

}

**IdentifiableObject.cs**

using System;

using System.Collections.Generic;

namespace Iteration3

{

public class IdentifiableObject

{

private readonly List<string> \_idents = [];

public IdentifiableObject(string[] idents)

{

foreach (string s in idents)

{

AddIdentifier(s);

}

}

public bool AreYou(string id)

{

return \_idents.Contains(id.ToLower());

}

public string FirstID

{

get

{

if (\_idents.Count == 0)

{

return "";

}

else

{

return \_idents[0];

}

}

}

public void AddIdentifier(string id)

{

\_idents.Add(id.ToLower());

}

}

}

**GameObject.cs**

using System;

using System.Collections.Generic;

using System.Text;

namespace Iteration3

{

public class GameObject(string[] idents, string name, string desc) : IdentifiableObject(idents)

{

private readonly string \_description = desc;

private readonly string \_name = name;

public string Name

{

get

{

return \_name;

}

}

public string ShortDescription

{

get

{

return "a " + \_name + " " + FirstID;

}

}

public virtual string FullDescription

{

get

{

return \_description;

}

}

}

}

**ItemsTest.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Iteration3

{

[TestFixture]

public class TestItem

{

Item shield;

[SetUp]

public void SetUp()

{

shield = new Item(["shield"], "gold", "a gold shield that lasts a lifetime");

}

[Test]

public void TestItemIsIdentifiable()

{

Assert.Multiple(() =>

{

Assert.That(shield.AreYou("shield"), Is.True, "True");

Assert.That(shield.AreYou("sword"), Is.False, "True");

});

}

[Test]

public void TestShortDescription()

{

Assert.That(shield.ShortDescription, Is.EqualTo("a gold shield"));

}

[Test]

public void TestFullDescription()

{

Assert.That(shield.FullDescription, Is.EqualTo("a gold shield that lasts a lifetime"));

}

}

}

**Inventory.cs**

using System;

using System.Collections.Generic;

using NUnit.Framework;

namespace Iteration3

{

[TestFixture]

public class TestInventory

{

Inventory inventory;

Item sword;

Item shield;

Item potion;

[SetUp]

public void SetUp()

{

inventory = new Inventory();

sword = new Item(["sword"], "diamond", "a diamond sword which has not broken once");

shield = new Item(["shield"], "gold", "a gold shield that lasts a lifetime");

potion = new Item(["potion"], "healing", "a healing potion which is needed for the adventurers");

inventory.Put(sword);

inventory.Put(shield);

}

[Test]

public void TestFindItem()

{

Assert.Multiple(() =>

{

Assert.That(inventory.HasItem("sword"), Is.True);

Assert.That(inventory.HasItem("shield"), Is.True);

});

}

[Test]

public void TestNoItemFind()

{

Assert.That(inventory.HasItem("potion"), Is.False);

}

[Test]

public void TestFetchItem()

{

Assert.Multiple(() =>

{

Assert.That(inventory.Fetch("sword"), Is.EqualTo(sword));

Assert.That(inventory.HasItem("sword"), Is.True);

});

}

[Test]

public void TestTakeItem()

{

Assert.Multiple(() =>

{

Assert.That(inventory.Take("sword"), Is.EqualTo(sword));

Assert.That(inventory.HasItem("sword"), Is.False);

Assert.That(inventory.HasItem("shield"), Is.True);

Assert.That(inventory.HasItem("potion"), Is.False);

});

}

[Test]

public void TestItemList()

{

Assert.That(inventory.ItemList, Is.EqualTo("\ta diamond sword\n\ta gold shield\n"));

}

}

}

**PlayersTest.cs**

using System;

using System.Collections.Generic;

using NUnit.Framework;

namespace Iteration3

{

[TestFixture]

public class TestPlayer

{

Player player;

Item sword;

Item shield;

[SetUp]

public void Setup()

{

player = new Player("ruchan", "a member of a chess club");

sword = new Item(["sword"], "diamond", "a diamond sword which has not broken once");

shield = new Item(["shield"], "gold", "a gold shield that lasts a lifetime");

player.Inventory.Put(sword);

player.Inventory.Put(shield);

}

[Test]

public void TestPLayerIsIdentifiable()

{

Assert.Multiple(() =>

{

Assert.That(player.AreYou("me"), Is.True, "True");

Assert.That(player.AreYou("inventory"), Is.True, "True");

});

}

[Test]

public void TestPlayerLocatesItems()

{

var result = false;

var itemLocated = player.Locate("sword");

if (sword == itemLocated)

{

result = true;

}

Assert.That(result, Is.True);

\_ = player.Locate("shield");

if (shield == itemLocated)

{

result = true;

}

Assert.That(result, Is.True);

}

[Test]

public void TestPlayerLocatesItself()

{

Assert.Multiple(() =>

{

Assert.That(player.Locate("me"), Is.EqualTo(player));

Assert.That(player.Locate("inventory"), Is.EqualTo(player));

});

}

[Test]

public void TestPlayerLocatesNothing()

{

Assert.That(player.Locate("plate"), Is.EqualTo(null));

}

[Test]

public void TestPlayerFullDescription()

{

Assert.That(player.FullDescription, Is.EqualTo("You are ruchan, a member of a chess club.\nYou are carrying:\n\ta diamond sword\n\ta gold shield\n"));

}

}

}

**BagTest.cs**

using System;

using System.Collections.Generic;

using NUnit.Framework;

namespace Iteration3

{

[TestFixture]

public class TestBag

{

Item sword;

Item shield;

Bag bag;

Bag backpack;

[SetUp]

public void SetUp()

{

sword = new Item(["sword"], "diamond", "a diamond sword which has not broken once");

shield = new Item(["shield"], "gold", "a gold shield that lasts a lifetime");

bag = new Bag(["bag"], "leather bag", "a light bag, suitable for short trips");

backpack = new Bag(["backpack"], "fabric backpack", "a medium-sized backpack, suitable for abroad travelling");

bag.Inventory.Put(sword);

backpack.Inventory.Put(shield);

backpack.Inventory.Put(bag);

}

[Test]

public void TestBagLocatesItems()

{

Assert.Multiple(() =>

{

Assert.That(bag.Locate("sword"), Is.EqualTo(sword));

Assert.That(backpack.Locate("shield"), Is.EqualTo(shield));

});

}

[Test]

public void TestBagLocatesItself()

{

Assert.Multiple(() =>

{

Assert.That(bag.Locate("bag"), Is.EqualTo(bag));

Assert.That(backpack.Locate("backpack"), Is.EqualTo(backpack));

});

}

[Test]

public void TestBagLocatesNothing()

{

Assert.That(bag.Locate("Nothing"), Is.EqualTo(null));

}

[Test]

public void TestBagFullDescription()

{

Assert.That(bag.FullBagDescription, Is.EqualTo("In the leather bag you can see:\n\ta diamond sword\n"));

}

[Test]

public void TestBagInBag()

{

Assert.Multiple(() =>

{

Assert.That(backpack.Locate("bag"), Is.EqualTo(bag));

Assert.That(bag.Locate("sword"), Is.EqualTo(sword));

Assert.That(bag.Locate("shield"), Is.EqualTo(null));

});

}

}

}

**IdentifiableObjectTest.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using NUnit.Framework;

namespace Iteration3

{

[TestFixture]

public class TestIdentifiableObject

{

[Test]

public void TestAreYou()

{

string[] testArray = ["Fred", "Bob"];

IdentifiableObject testIdentifiableObject = new(testArray);

Assert.That(testIdentifiableObject.AreYou("fred"), Is.True);

}

[Test]

public void TestNotAreYou()

{

string[] testArray = ["Fred", "Bob"];

IdentifiableObject testIdentifiableObject = new(testArray);

Assert.That(testIdentifiableObject.AreYou("wilma"), Is.False);

}

[Test]

public void TestCaseSensitive()

{

string[] testArray = ["Fred", "Bob"];

IdentifiableObject testIdentifiableObject = new(testArray);

Assert.That(testIdentifiableObject.AreYou("bOB"), Is.True);

}

[Test]

public void TestFirstID()

{

string[] testArray = ["Fred", "Bob"];

IdentifiableObject testIdentifiableObject = new(testArray);

StringAssert.AreEqualIgnoringCase("fred", testIdentifiableObject.FirstID);

}

[Test]

public void TestFirstIDWithNoIDs()

{

string[] testArray = [];

IdentifiableObject testIdentifiableObject = new(testArray);

StringAssert.AreEqualIgnoringCase("", testIdentifiableObject.FirstID);

}

[Test]

public void TestAddID()

{

string[] testArray = ["Fred", "Bob"];

IdentifiableObject testIdentifiableObject = new(testArray);

testIdentifiableObject.AddIdentifier("Wilma");

Assert.Multiple(() =>

{

Assert.That(testIdentifiableObject.AreYou("fred"), Is.True);

Assert.That(testIdentifiableObject.AreYou("bob"), Is.True);

Assert.That(testIdentifiableObject.AreYou("wilma"), Is.True);

});

}

}

}