

COS20007: Object Oriented Programming

Credit Task 7.2: Case Study — Iteration 6: Locations

Show Wai Yan/105293041

Location.cs

```
namespace SwinAdventure
{
    public class Location : GameObject, IHaveInventory
    {
        // Fields
        private readonly Inventory _inventory;
        private readonly string _arrivalJourney; // to indicate how player enter this location
        private Dictionary<string, Location> _exists; // to indicate 10 directions

        // Constructor
        public Location(string[] ids, string name, string description, string arrivalJourney)
            : base(ids.Concat(new string[] { "location", "place" }).ToArray(), name, description)
        {
            _inventory = new Inventory();
            _arrivalJourney = arrivalJourney;
        }

        // Properties
        public Inventory Inventory
        {
            get { return _inventory; } // Readonly properties
        }

        public string ArrivalJourney
        {
            get { return _arrivalJourney; }
        }

        public override string ShortDescription
        {
            // need to make base's properties as virtual to make specific for location
            get { return FirstId; }
        }

        public override string FullDescription
        {
            get
            {
                return $"{base.FullDescription}\n{FindExists()}\nIn this room you can see\n{Inventory.ItemList}";
            }
        }

        public Dictionary<string, Location> Exists
        {
            get { return _exists; }
            set { _exists = value; }
        }

        // Methods
        public GameObject Locate(string id)
        {
            if (AreYou(id))
                return this;
            return _inventory.Fetch(id);
        }

        public string FindExists()
        {
            // Currently placeholder for testing
            // will be implemented in iteration 7
            return "There are exits to the south.";
        }
    }
}
```

Player.cs

```
namespace SwinAdventure
{
    public class Player : GameObject, IHaveInventory
    {
        // Field
        private Inventory _inventory = new Inventory();
        private Location _currentLocation;

        // Constructor
        public Player(string name, string desc, Location spawnLocatoIn)
            : base(new string[] { "me", "inventory" }, name, desc)
        {
            _currentLocation = spawnLocatoIn;
        }

        // Properties
        public override string FullDescription
        {
            get
            {
                return $"You are {Name} {base.FullDescription}\nYou are carrying\n {Inventory.ItemList}";
            }
        }

        public Inventory Inventory
        {
            get { return _inventory; }
        }

        public Location CurrentLocation {
            get {return _currentLocation;}
        }

        // Methods
        public GameObject Locate(string id)
        {
            if (AreYou(id))
                return this;

            GameObject obj = Inventory.Fetch(id);
            if (obj != null)
                return obj;

            obj = CurrentLocation.Locate(id);
            if (obj != null)
                return obj;

            return null;
        }

        public string WhereAmI()
        {
            return $"You are in {CurrentLocation.ShortDescription}";
        }

        public string Arrive()
        {
            return $"You have arrived in {CurrentLocation.ShortDescription}";
        }

        // For Iteration 7
        // public string Exit()
        // {
        //     return "";
        // }

        // public string Travel()
        // {
        //     return "";
        // }
    }
}
```

LookCommand.cs

```
namespace SwinAdventure
{
    public class LookCommand : Command
    {
        public LookCommand()
            : base(new string[] { "look" }) { }

        public override string Execute(Player p, string[] text)
        {
            IHaveInventory container = null;
            string containerId;
            string itemId;

            if (text[0].ToLower() != "look")
                return "Error in look input";

            switch (text.Length)
            {
                case 1:
                    return p.CurrentLocation.FullDescription;
                    break;
                case 3:
                    if (text[1].ToLower() != "at")
                        return "What do you want to look at?";
                    container = p;
                    break;
                case 5:
                    if (text[3].ToLower() != "in")
                        return "What do you want to look in?";
                    containerId = text[4].ToLower();
                    container = FetchContainer(p, containerId);
                    break;
                default:
                    return "I don't know how to look like that";
            }

            itemId = (text.Length > 2) ? text[2].ToLower() : null;
            return LookAtIn(itemId, container);
        }

        private IHaveInventory FetchContainer(Player p, string containerId)
        {
            return p.Locate(containerId) as IHaveInventory;
        }

        private string LookAtIn(string thingId, IHaveInventory container)
        {
            if (container == null)
                return "I cannot find the bag";

            if (container.Locate(thingId) == null)
                return $"I cannot find the {thingId} in the {container.Name}";

            return container.Locate(thingId).FullDescription;
        }
    }
}
```

GameObject.cs

```
namespace SwinAdventure
{
    public abstract class GameObject : IdentifiableObject
    {
        // Fields
        private string _description;
        private string _name;

        // Constructor
        public GameObject(string[] ids, string name, string desc) : base(ids)
        {
            _name = name;
            _description = desc;
        }

        // Properties
        public string Name
        {
            get { return _name; }
        }

        public virtual string ShortDescription
        {
            get
            {
                char firstChar = char.ToLower(Name[0]);
                string article = (firstChar == 'a' || firstChar == 'e' || firstChar == 'i' ||
                                firstChar == 'o' || firstChar == 'u') ? "an" : "a";
                return $"{article} {Name.ToLower()} ({FirstId})";
            }
        }

        public virtual string FullDescription
        {
            get { return _description; }
        }
    }
}
```

Program.cs

```
namespace SwinAdventure
{
    public class Program
    {
        public static void Main(string[] args)
        {
            // Configurations
            string helpCommand =
                $"Here is the List of command\n\t- look at me: Display what you are carrying in your\n\tinventory\n\t- look at <item> [?in <container>]: Get description of that item, which inside in the\n\tcontainer\n\t- quit/exit: Halt the program\n";

            // Getting Player's Name and Description
            string playerName = "";
            string playerDescription = "";
            Console.WriteLine("Write Your Name, Traveller!");
            Console.Write("NAME -> ");
            playerName = Console.ReadLine();
            Console.WriteLine("How about Your description, Traveller!");
            Console.Write("Description -> ");
            playerDescription = Console.ReadLine();

            // Object Configurations
            Location hallWay = new Location(
                new string[] { "the Hallway", "Hallway" },
                "Hallway",
                "This is a long well lit Hallway.",
                "walk down into the Hallway"
            );
            Player me = new Player(playerName, playerDescription, hallWay); // Create Player

            // Create two items and put these to player's inventory
            Item sword = new Item(
                new string[] { "sword", "bronze sword" },
                "Bronze Sword",
                "A shiny bronze sword"
            );
        }
    }
}
```

```

Item shield = new Item(
    new string[] { "shield", "wooden shield" },
    "Wooden Shield",
    "A tough wooden shield"
);

me.Inventory.Put(sword);
me.Inventory.Put(shield);

// Create a bag and put it to player's inventory
Bag myBag = new Bag(
    new string[] { "bag", "backpack" },
    "Leather Bag",
    "A sturdy leather bag to carry items"
);
me.Inventory.Put(myBag);

// Create another item and add it to the bag
Item potion = new Item(
    new string[] { "potion", "health potion" },
    "Health Potion",
    "A magical red potion that restores health"
);

myBag.Inventory.Put(potion);

// Create three object and placed in the Hallway
Item bow = new Item(
    new string[] { "bow", "longbow" },
    "Longbow",
    "A finely crafted bow with great range"
);

Item helmet = new Item(
    new string[] { "helmet", "iron helmet" },
    "Iron Helmet",
    "A sturdy iron helmet for head protection"
);

Item ring = new Item(
    new string[] { "ring", "magic ring" },
    "Magic Ring",
    "A mysterious ring that glows faintly with magical energy"
);

hallWay.Inventory.Put(bow);
hallWay.Inventory.Put(helmet);
hallWay.Inventory.Put(ring);

// Command Configuration
LookCommand lookCommand = new LookCommand();

// Game Loop
Console.WriteLine("Write '-h' for helper");

Console.WriteLine(me.Arrive());
while (true)
{
    string command = "";
    Console.Write("Command -> ");
    command = Console.ReadLine().ToLower();
    Console.WriteLine(); // to make clear after input line for presented looking

    if (command == "exit" || command == "quit")
    {
        Console.WriteLine("Take the rest, Traveller!");
        return;
    }
    else if (command == "-h")
    {
        Console.WriteLine(helpCommand);
    }
    else
    {
        Console.WriteLine(lookCommand.Execute(me, command.Split(' ')));
    }
}
}
}
}

```

TestPlayer.cs

```
using NUnit.Framework;
using NUnit.Framework.Legacy;
using SwinAdventure;
namespace UnitTests
{
    [TestFixture]
    public class TestPlayer
    {
        private Player testPlayer;
        private Location testLocation;
        private Item sword = new Item(
            new string[] { "sword", "bronze sword" },
            "Bronze Sword",
            "A shiny bronze sword"
        );
        private Item shield = new Item(
            new string[] { "shield", "wooden shield" },
            "Wooden Shield",
            "A tough wooden shield"
        );
        private Item potion = new Item(
            new string[] { "potion", "health potion" },
            "Health Potion",
            "A magical red potion that restores health"
        );

        [SetUp]
        public void Setup()
        {
            testLocation = new Location(
                new string[] { "a small tant", "tant" },
                "Small Tant",
                "This a rest place for traveller.",
                "walk by the road and see the tank and come in."
            );
            testPlayer = new Player("Show", "The Programmer", testLocation);

            testPlayer.Inventory.Put(sword);
            testPlayer.Inventory.Put(shield);
            testPlayer.Inventory.Put(potion);
        }

        [Test]
        public void TestPlayerIsIdentifiable()
        {
            ClassicAssert.True(testPlayer.AreYou("me"));
            ClassicAssert.True(testPlayer.AreYou("inventory"));
        }

        [Test]
        public void TestPlayerLocateItems()
        {
            ClassicAssert.That(sword, Is.EqualTo(testPlayer.Locate("sword")));
            ClassicAssert.True(testPlayer.Inventory.HasItem("sword"));
            ClassicAssert.That(shield, Is.EqualTo(testPlayer.Locate("wooden shield")));
            ClassicAssert.True(testPlayer.Inventory.HasItem("wooden shield"));
        }

        [Test]
        public void TestPlayerLocateItself()
        {
            ClassicAssert.That(testPlayer, Is.EqualTo(testPlayer.Locate("me")));
            ClassicAssert.That(testPlayer, Is.EqualTo(testPlayer.Locate("inventory")));
        }

        [Test]
        public void TestPlayerLocateNothing()
        {
            ClassicAssert.That(testPlayer.Locate("gun"), Is.EqualTo(null));
        }

        [Test]
        public void TestPlayerFullDescription()
        {
            string testDescription =
                $"You are Show The Programmer\nYou are carrying\n
                \t{sword.ShortDescription}\n\t{shield.ShortDescription}\n\t{potion.ShortDescription}\n";
            ClassicAssert.That(testPlayer.FullDescription, Is.EqualTo(testDescription));
        }
    }
}
```

TestLookCommand.cs

```
using NUnit.Framework;
using NUnit.Framework.Legacy;
using SwinAdventure;

namespace UnitTests
{
    [TestFixture]
    public class TestLookCommand
    {
        private LookCommand look;
        private Location testLocation;
        private Player testPlayer;
        private Bag bag;
        private Item gem = new Item(new string[] { "gem" }, "a gem", "This is a gem");
        private Item shovel = new Item(new string[] { "shovel" }, "a shovel", "This is a shovel");
        private Item diamond = new Item(
            new string[] { "diamond" },
            "a diamond",
            "This is a diamond"
        );

        [SetUp]
        public void Setup()
        {
            look = new LookCommand();
            testLocation = new Location(
                new string[] { "a small tant", "tant" },
                "Small Tant",
                "This a rest place for traveller.",
                "walk by the road and see the tank and come in."
            );
            testPlayer = new Player("Show", "The Programmer", testLocation);
            bag = new Bag(
                new string[] { "bag", "backpack", "leather bag" },
                "Leather Bag",
                "A sturdy leather bag to carry items"
            );
            testPlayer.Inventory.Put(bag);
        }

        [Test]
        public void TestLookAtMe()
        {
            string excepted = testPlayer.FullDescription;
            string testOutPut = look.Execute(
                testPlayer,
                new string[] { "look", "at", "Inventory" }
            );
            ClassicAssert.That(testOutPut, Is.EqualTo(excepted));
        }

        [Test]
        public void TestLookAtGem()
        {
            string excepted = gem.FullDescription;
            testPlayer.Inventory.Put(gem);
            string testOutPut = look.Execute(testPlayer, new string[] { "look", "at", "Gem" });
            ClassicAssert.That(testOutPut, Is.EqualTo(excepted));
        }

        [Test]
        public void TestLookAtUnk()
        {
            string excepted = $"I cannot find the gem in the {testPlayer.Name}";
            string testOutPut = look.Execute(testPlayer, new string[] { "look", "at", "Gem" });
            ClassicAssert.That(testOutPut, Is.EqualTo(excepted));
        }

        [Test]
        public void TestLookAtGemInMe()
        {
            string excepted = gem.FullDescription;
            testPlayer.Inventory.Put(gem);
            string testOutPut = look.Execute(
                testPlayer,
                new string[] { "look", "at", "Gem", "in", "me" }
            );
            ClassicAssert.That(testOutPut, Is.EqualTo(excepted));
        }

        [Test]
    }
```

```

public void TestLookAtGemInBag()
{
    string expected = gem.FullDescription;
    bag.Inventory.Put(gem);
    string testOutPut = look.Execute(
        testPlayer,
        new string[] { "look", "at", "Gem", "in", "bag" }
    );
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));
}

[Test]
public void TestLookAtGemInNoBag()
{
    string expected = "I cannot find the bag";
    Player noBagPlayer = new Player("Ricky", "I have No Bag bro", testLocation);
    string testOutPut = look.Execute(
        noBagPlayer,
        new string[] { "look", "at", "Gem", "in", "bag" }
    );
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));
}

[Test]
public void TestLookAtNoGemInBag()
{
    string expected = $"I cannot find the gem in the {bag.Name}";
    string testOutPut = look.Execute(
        testPlayer,
        new string[] { "look", "at", "Gem", "in", "bag" }
    );
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));
}

[Test]
public void InvalidLook()
{
    string expected = "I don't know how to look like that";
    string testOutPut = look.Execute(testPlayer, new string[] { "look", "around" });
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));

    expected = "Error in look input";
    testOutPut = look.Execute(testPlayer, new string[] { "hello", "105293041" });
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));

    expected = $"I cannot find the show wai yan in the {testPlayer.Name}";
    testOutPut = look.Execute(testPlayer, new string[] { "look", "at", "Show Wai Yan" });
    ClassicAssert.That(testOutPut, Is.EqualTo(expected));
}
}
}

```

TestLocation.cs

```

using NUnit.Framework;
using NUnit.Framework.Legacy;
using SwinAdventure;

namespace UnitTests
{
    [TestFixture]
    public class TestLocation
    {
        private Location testLocation;
        private Bag bag;
        private Player player;
        private Item gem = new Item(new string[] { "gem" }, "a gem", "This is a gem");
        private Item shovel = new Item(new string[] { "shovel" }, "a shovel", "This is a shovel");
        private Item diamond = new Item(
            new string[] { "diamond" },
            "a diamond",
            "This is a diamond"
        );

        [SetUp]
        public void Setup()
        {
            testLocation = new Location(
                new string[] { "a small tant", "tant" },
                "Small Tant",
                "This a rest place for traveller.",
            );
        }
    }
}

```



```

        "walk by the road and see the tank and come in."
    );
    bag = new Bag(
        new string[] { "bag", "backpack", "leather bag" },
        "Leather Bag",
        "A sturdy leather bag to carry items"
    );
    player = new Player("Show", "The Programmer", testLocation);
    bag.Inventory.Put(gem);
    bag.Inventory.Put(diamond);
    testLocation.Inventory.Put(shovel);
    testLocation.Inventory.Put(bag);
}

[Test]
public void TestLocationIsIdentifiable()
{
    ClassicAssert.True(testLocation.AreYou("location"));
    ClassicAssert.True(testLocation.AreYou("place"));
}

[Test]
public void TestLocationCanLocateItem()
{
    string bagId = bag.FirstId;
    ClassicAssert.That(bag, Is.EqualTo(testLocation.Locate(bagId)));

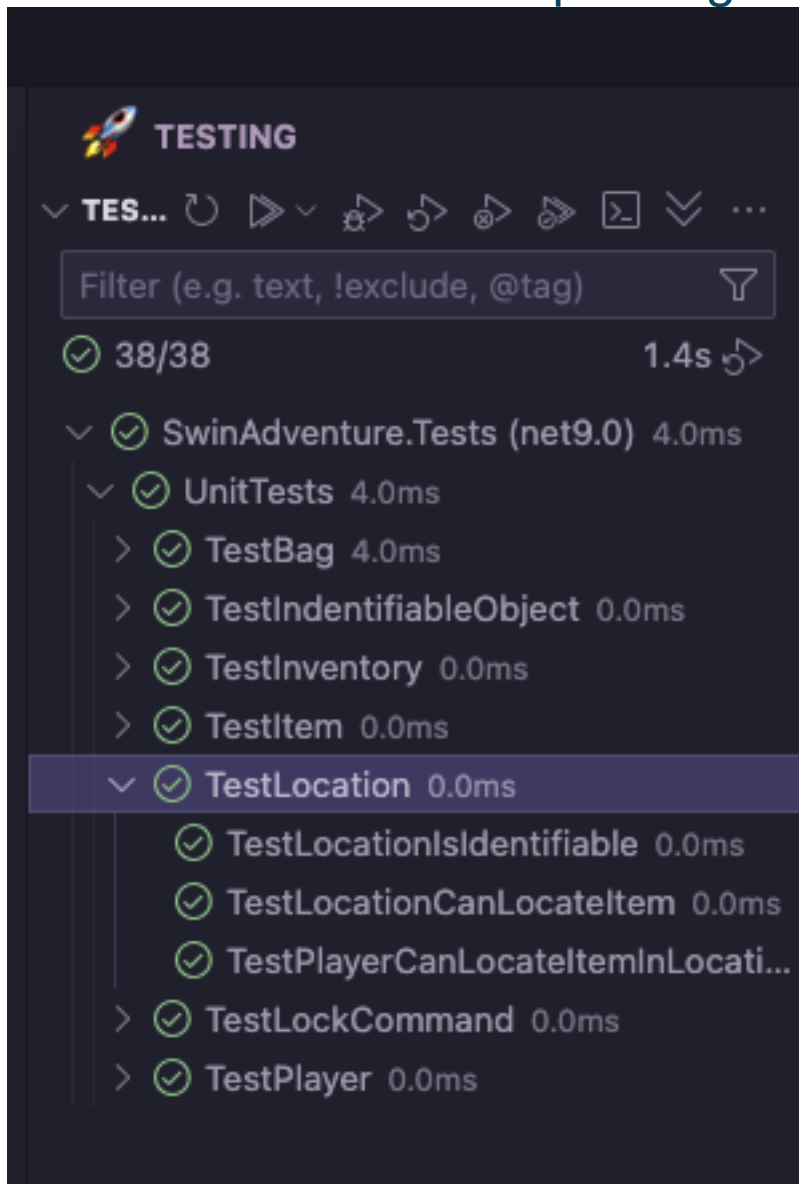
    string shovelId = shovel.FirstId;
    ClassicAssert.That(shovel, Is.EqualTo(testLocation.Locate(shovelId)));
}

[Test]
public void TestPlayerCanLocateItemInLocation()
{
    string bagId = bag.FirstId;
    ClassicAssert.That(bag, Is.EqualTo(player.Locate(bagId)));

    string shovelId = shovel.FirstId;
    ClassicAssert.That(shovel, Is.EqualTo(player.Locate(shovelId)));
}
}
}

```

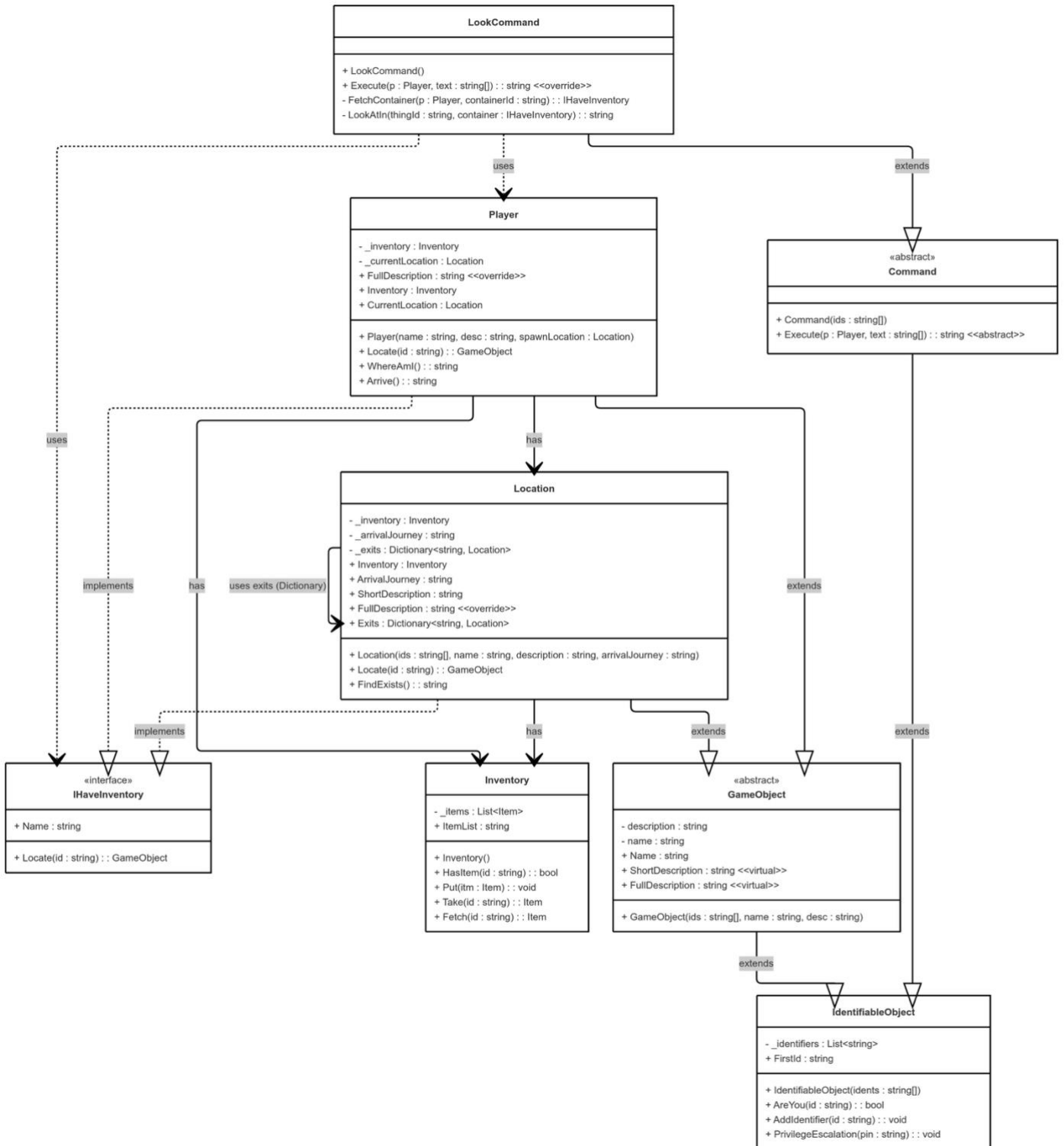
Screenshot of unit test passing



Screenshot of program running showing new commands related to locations

```
Write Your Name, Traveller!  
NAME → Show Wai Yan  
How about Your description, Traveller!  
Description → 105293041  
Write '-h' for helper  
You have arrived in the hallway  
Command → look  
  
This is a long well lit Hallway.  
There are exits to the south.  
In this room you can see  
    a longbow (bow)  
    an iron helmet (helmet)  
    a magic ring (ring)  
  
Command → look at bow  
  
A finely crafted bow with great range  
Command → look at helmet  
  
A sturdy iron helmet for head protection  
Command → look at ring  
  
A mysterious ring that glows faintly with magical energy  
Command → █
```

UML Class diagram showing what needs to be added



UML Sequence diagram to explain how Locate works in the Player

