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 fortesting
            // will be implemented in itertaion 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 : IndentifiableObject
    {
        // 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
inventory\n\t- look at <item> [?in <container>]: Get description of that item,which inside in the
container\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 TestLockCommand
    {
        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]
```

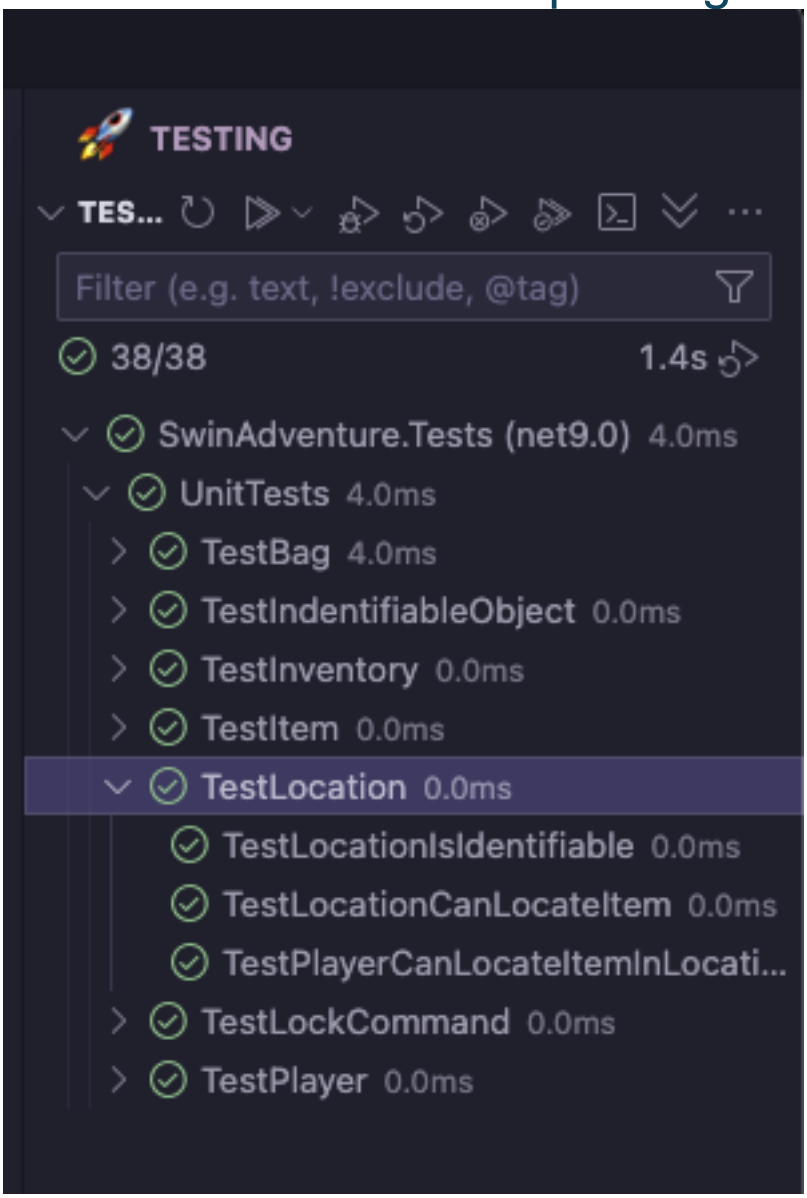
```
        public void TestLookAtGemInBag()
        {
            string excepted = gem.FullDescription;
            bag.Inventory.Put(gem);
            string testOutPut = look.Execute(
                testPlayer,
                new string[] { "look", "at", "Gem", "in", "bag" }
            );
   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

        [Test]
        public void TestLookAtGemInNoBag()
        {
            string excepted = "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(excepted));
        }

        [Test]
        public void TestLookAtNoGemInBag()
        {
            string excepted = $"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(excepted));
        }

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

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

            excepted = $"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(excepted));
        }
    }
}
```

TestLocation.cs

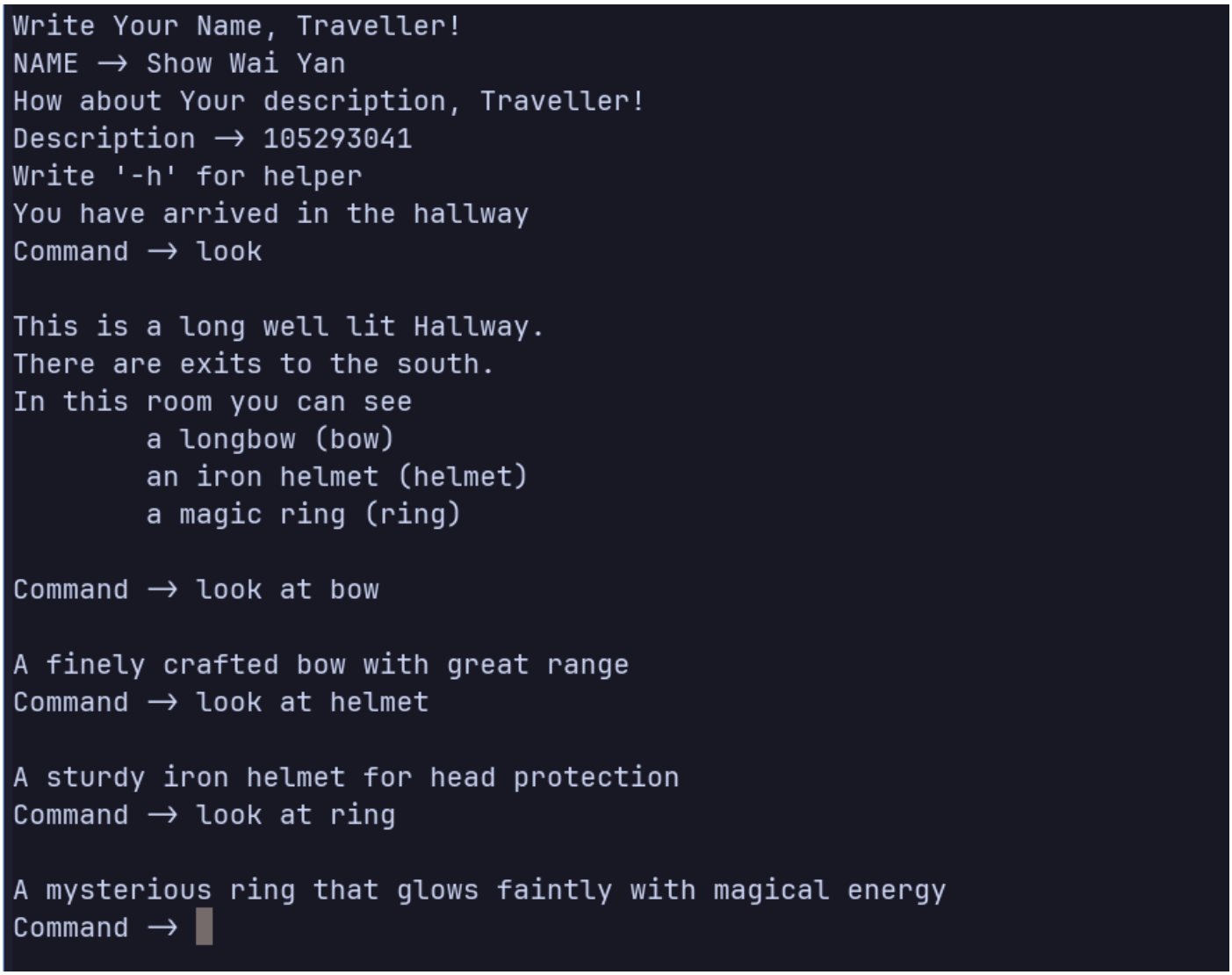
```
using NUnit.Framework;
using NUnit.Framework.Legacy;
using SwinAdventure;

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)));
        }
    }
}
```

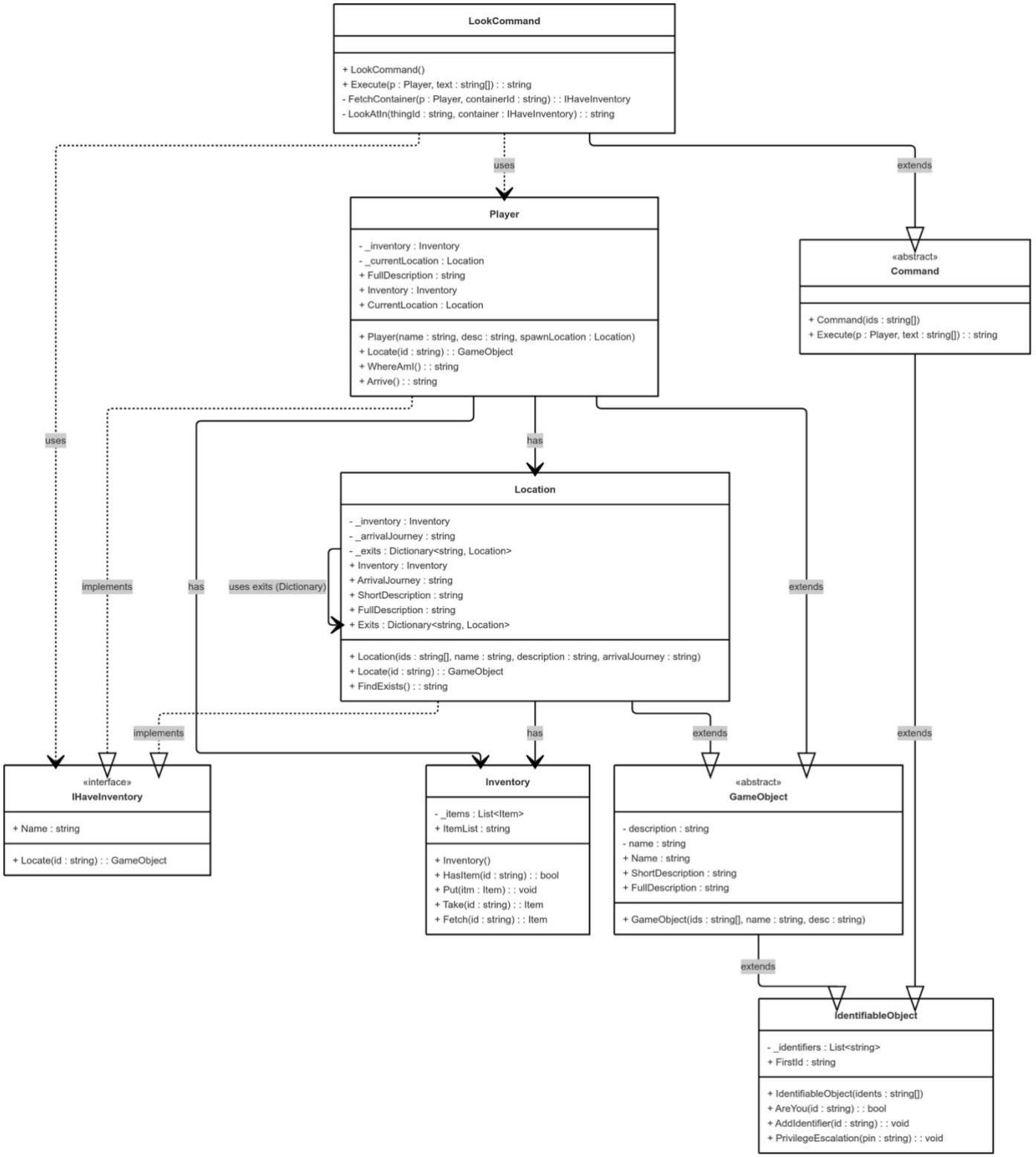
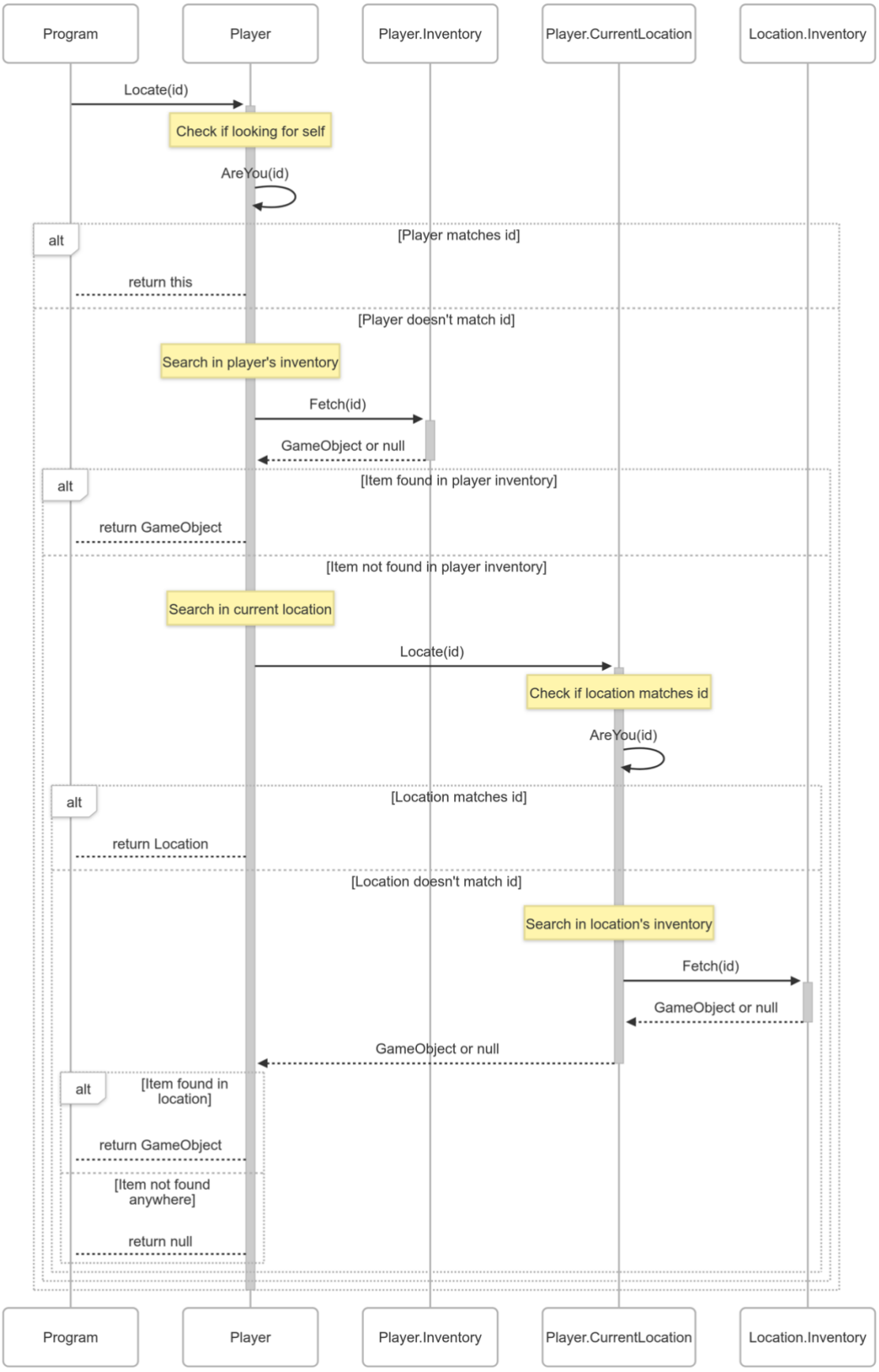
Screenshot of unit test passing



Screenshot of program running showing new commands related to locations



UML Class diagram showing what needs to be added



UML Sequence diagram to explain how Locate works in the Player