```
Command.cs
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System. Threading. Tasks;
namespace Iteration6
    public abstract class Command(string[] ids) : IdentifiableObject(ids)
        public abstract string Execute(Player p, string[] text);
}
Items.cs
using System;
using System.Collections.Generic;
using System.Text;
namespace Iteration6
    public class Item(string[] idents, string name, string desc) :
GameObject(idents, name, desc)
    {
    }
}
Look.cs
using System;
using System.Reflection.Metadata.Ecma335;
namespace Iteration6
    public class Look : Command
        public Look() : base(["look"])
        }
        private static IHaveInventory? FetchContainer(Player p, string
containerId)
        {
            return p.Locate(containerId) as IHaveInventory;
        private static string LookAtIn(string thingId, IHaveInventory container)
            GameObject foundItem = container.Locate(thingId);
            if (foundItem == null)
            {
                if (container == container.Locate("inventory"))
                {
                    return $"I can't find {thingId}";
                }
                else
                {
```

```
return $"I can't find {thingId} in the {container.Name}";
                }
            }
            return foundItem.FullDescription;
        }
        public override string Execute(Player p, string[] text)
            IHaveInventory? container = p;
            string _itemid;
            string error = "I don't know how to look like that";
            string error1 = "Error in look input";
            string error2 = "What do you want to look at?";
            string error3 = "What do you want to look in?";
            if (text.Length == 1 && text[0].Equals("look",
StringComparison.CurrentCultureIgnoreCase))
                return $"You are in {p.Location.Name},
{p.Location.FullDescription}";
            }
            if (text.Length != 3 && text.Length != 5)
            {
                return error;
            if (!text[0].Equals("look",
StringComparison.CurrentCultureIgnoreCase))
                return error1;
            }
            if (!text[1].Equals("at", StringComparison.CurrentCultureIgnoreCase))
                return error2;
            if (text.Length == 5)
                if (!text[3].Equals("in",
StringComparison.CurrentCultureIgnoreCase))
                    return error3;
                container = FetchContainer(p, text[4]);
                if (container == null)
                    return $"I can't find the {text[4]}";
            return LookAtIn(text[2], container);
        }
    }
}
Inventory.cs
using System;
using System.Collections.Generic;
namespace Iteration6
{
    public class Inventory
```

```
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;
            }
        }
    }
GameObject.cs
using System;
using System.Collections.Generic;
using System.Text;
```

private readonly List<Item> _items;

```
namespace Iteration6
    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;
        }
    }
}
Bag.cs
using System;
using System.Xml.Linq;
namespace Iteration6
    public class Bag(string[] idents, string name, string desc) : Item(idents,
name, desc), IHaveInventory
        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 override string FullDescription
            get
            {
                string InventoryDescription = "In the " + Name + " you can
see:\n";
                InventoryDescription += _inventory.ItemList;
                return InventoryDescription;
            }
        }
    }
}
Players.cs
using System;
using System.Collections;
using System.Collections.Generic;
using System.Linq;
using System.Xml.Linq;
namespace Iteration6
    public class Player(string name, string desc) : GameObject(["me",
"inventory"], name, desc), IHaveInventory
    {
        private readonly Inventory _inventory = new();
        private Location _location;
        public GameObject Locate(string id)
            if (AreYou(id))
            {
                return this;
            GameObject obj = _inventory.Fetch(id);
            if (obj != null)
            {
                return obj;
            if (_location != null)
                obj = _location.Locate(id);
                return obj;
            }
            else
            {
                return null;
            }
        }
        public override string FullDescription
            get
                return "You are " + Name + ", a " + base.FullDescription +
".\nYou are carrying:\n" + _inventory.ItemList;
        }
```

```
public Inventory Inventory
            get
                return _inventory;
        }
        public Location Location
            get
            {
                return _location;
            }
            set
            {
                _location = value;
        }
    }
}
Location.cs
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace Iteration6
    public class Location(string[] idents, string name, string desc) :
GameObject(idents, name, desc), IHaveInventory
        private readonly Inventory _inventory = new();
        public GameObject Locate(string id)
            if (AreYou(id))
            {
                return this;
            return _inventory.Fetch(id);
        public override string FullDescription
            get
                return $"{base.FullDescription}\n\nItems
available:\n{_inventory.ItemList}";
        }
        public Inventory Inventory
            get
            {
                return _inventory;
        }
```

```
}
IhaveInventory.cs
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace Iteration6
    interface IHaveInventory
        GameObject Locate(string id);
        string Name
            get;
        }
    }
}
IdentifiableObject.cs
using System;
using System.Collections.Generic;
namespace Iteration6
    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());
        }
   }
}
Program.cs
using System;
namespace Iteration6
   public class Interface
        static void Main(string[] args)
            Player player;
            Bag bag;
            Bag backpack;
            Item sword;
            Item shield;
            Item potion;
            Item gem;
            Location garage;
            Item monitor;
            Item computer;
            Item phone;
            Command lookcommand;
            string input = "";
            Console.WriteLine("Press Q to Exit \n");
            Console.WriteLine("What is your name?");
            string name = Console.ReadLine();
            Console.WriteLine($"Hi {name}, What is your occupation?");
            string description = Console.ReadLine();
            player = new Player(name, description);
            garage = new Location(["garage"], "big garage", "a room where items
are stored");
            player.Location = garage;
            Console.WriteLine($"You are {name}, a {description}. Welcome to the
{player.Location.Name}");
            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");
            gem = new Item(["gem"], "gem", "A gem that could be used to trade
items.");
            sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            shield = new Item(["shield"], "gold shield", "a gold shield that
lasts a lifetime");
            potion = new Item(["potion"], "healing potion", "a healing potion
which is needed for adventurers");
            monitor = new Item(["monitor"], "new monitor", "a brand new
monitor");
```

```
computer = new Item(["computer"], "public computer", "a computer
which is suitable for students");
            phone = new Item(["phone"], "mobile phone", "a phone that is recently
sold");
            garage.Inventory.Put(monitor);
            garage.Inventory.Put(computer);
            garage.Inventory.Put(phone);
            player.Location = garage;
            player.Inventory.Put(computer);
            lookcommand = new Look();
            player.Inventory.Put(sword);
            player.Inventory.Put(shield);
            player.Inventory.Put(bag);
            player.Inventory.Put(potion);
            player.Inventory.Put(backpack);
            bag.Inventory.Put(potion);
            backpack.Inventory.Put(sword);
            backpack.Inventory.Put(bag);
            while (input != "q")
            {
                Console.Write("Look command: \n");
                input = Console.ReadLine().ToLower();
                if (input != "q")
                {
                    Console.WriteLine(lookcommand.Execute(player,
input.Split()));
                }
                else
                    break;
                }
            }
        }
    }
}
LocationTest.cs
using System;
using System.Collections.Generic;
using System.Ling;
using System.Numerics;
using System.Text;
using System. Threading. Tasks;
namespace Iteration6
{
    [TestFixture]
    public class LocationTest
        Player player;
        Location location;
        Item sword;
        [SetUp]
        public void SetUp()
```

```
player = new Player("ruchan", "member of a chess club");
sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            location = new Location(["garage"], "big garage", "a place where you
store stuff");
        }
        [Test]
        public void TestLocationIdentifyItself()
            GameObject result = location.Locate("garage");
            Assert.That(result, Is.EqualTo(location));
        }
        [Test]
        public void TestLocationLocateItemTheyHave()
            location.Inventory.Put(sword);
            GameObject expected = sword;
            GameObject actual = location.Locate("sword");
            Assert.That(actual, Is.EqualTo(expected));
        }
        [Test]
        public void TestPlayerCanLocateItemInTheirLocation()
             location.Inventory.Put(sword);
            player.Location = location;
            GameObject expected = sword;
            GameObject actual = player.Location.Locate("sword");
            Assert.That(actual, Is.EqualTo(expected));
        }
    }
}
PlayersTest.cs
using System;
using System.Collections.Generic;
using NUnit.Framework;
namespace Iteration6
{
    [TestFixture]
    public class TestPlayer
        Player player;
        Item sword;
        Item shield;
        [SetUp]
        public void Setup()
             player = new Player("ruchan", "member of a chess club");
             sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            shield = new Item(["shield"], "gold shield", "a gold shield that
lasts a lifetime");
             player.Inventory.Put(sword);
             player.Inventory.Put(shield);
        }
```

```
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 (sword)\n\ta gold
shield (shield)\n"));
        }
    }
}
LookTest.cs
using System;
using System.ComponentModel;
using System.Ling;
namespace Iteration6
```

[Test]

```
[TestFixture]
    public class TestLook
        Look look;
        Player player;
        Bag bag;
        Item sword;
        Item shield;
        Item potion;
        [SetUp]
        public void SetUp()
            look = new Look();
            player = new Player("ruchan", "member of a chess club");
            bag = new Bag(["bag"], "leather bag", "a light bag, suitable for
short trips");
            sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            shield = new Item(["shield"], "gold shield", "a gold shield that
lasts a lifetime");
            potion = new Item(["potion"], "healing potion", "a healing potion
which is needed for the adventurers");
        [Test]
        public void TestLookAtMe()
            Assert.That(look.Execute(player, ["look", "at", "me"]),
Is.EqualTo(player.FullDescription));
        [Test]
       public void TestLookAtSword()
            player.Inventory.Put(sword);
            Assert.That(look.Execute(player, ["look", "at", "sword"]),
Is.EqualTo(sword.FullDescription));
        [Test]
       public void TestLookAtUnknownItems()
            Assert.That(look.Execute(player, ["look", "at", "plate"]),
Is.EqualTo($"I can't find plate"));
        }
        [Test]
        public void TestLookAtSwordInMe()
            player.Inventory.Put(sword);
            Assert.That(look.Execute(player, ["look", "at", "sword", "in",
"me"]), Is.EqualTo(sword.FullDescription));
        [Test]
        public void TestLookAtSwordInBag()
            bag.Inventory.Put(sword);
            bag.Inventory.Put(shield);
            player.Inventory.Put(bag);
            Assert.That(look.Execute(player, ["look", "at", "sword", "in",
"bag"]), Is.EqualTo(sword.FullDescription));
```

```
}
       [Test]
       public void TestLookAtPotionInNoBag()
           bag.Inventory.Put(potion);
           Assert.That(look.Execute(player, ["look", "at", "potion", "in",
"bag"]), Is.EqualTo("I can't find the bag"));
       [Test]
       public void TestLookAtNoShieldInBag()
           bag.Inventory.Put(sword);
           player.Inventory.Put(bag);
           Assert.Multiple(() =>
           {
               Assert.That(look.Execute(player, ["look", "at", "shield", "in",
"bag"]), Is.EqualTo("I can't find potion in the leather bag"));
           });
       [Test]
       public void TestInvalidLook()
           Assert.Multiple(() =>
               Assert.That(look.Execute(player, ["look", "down"]), Is.EqualTo("I
don't know how to look like that"));
               Assert.That(look.Execute(player, ["stare", "at", "plate"]),
Is.EqualTo("Error in look input"));
               Assert.That(look.Execute(player, ["look", "at", "potion", "on",
"bag"]), Is.EqualTo("What do you want to look in?"));
               Assert.That(look.Execute(player, ["look", "for", "shield"]),
Is.EqualTo("What do you want to look at?"));
           });
       }
   }
}
ItemsTest.cs
using System;
using System.Collections.Generic;
using System.Ling;
using System.Text;
using System. Threading. Tasks;
namespace Iteration6
{
    [TestFixture]
   public class TestItem
       Item shield;
       [SetUp]
       public void SetUp()
           shield = new Item(["shield"], "gold shield", "a gold shield that
lasts a lifetime");
       [Test]
```

```
public void TestItemIdentifiable()
            Assert.That(shield.AreYou("shield"), Is.True, "True");
            Assert.That(shield.AreYou("sword"), Is.False, "True");
        }
        [Test]
        public void TestShortDesc()
            Assert.That(shield.ShortDescription, Is.EqualTo("a gold shield
(shield)"));
        [Test]
        public void TestFullDesc()
            Assert.That(shield.FullDescription, Is.EqualTo("a gold shield that
lasts a lifetime"));
        }
    }
}
InventoryTest.cs
using System;
using System.Collections.Generic;
using NUnit.Framework;
namespace Iteration6
    [TestFixture]
    public class TestInventory
        Inventory inventory;
        Item sword;
        Item shield;
        Item potion;
        [SetUp]
        public void SetUp()
            inventory = new Inventory();
            sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            shield = new Item(["shield"], "gold shield", "a gold shield that
lasts a lifetime");
            potion = new Item(["potion"], "healing potion", "a healing potion
which is needed for the adventurers");
            inventory.Put(sword);
            inventory.Put(shield);
        }
        [Test]
        public void TestFoundItem()
            Assert.Multiple(() =>
                Assert.That(inventory.HasItem("sword"), Is.True);
                Assert.That(inventory.HasItem("shield"), Is.True);
            });
```

```
[Test]
        public void TestNoItemFound()
            Assert.That(inventory.HasItem("potion"), Is.False);
        [Test]
        public void TestFecthItem()
            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
(sword)\n\ta gold shield (shield)\n"));
    }
}
IdentifiableObjectTest.cs
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System. Threading. Tasks;
using NUnit.Framework;
namespace Iteration6
    [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 testIdentifableObject = new(testArray);
            StringAssert.AreEqualIgnoringCase("", testIdentifableObject.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);
            });
        }
    }
}
BagTest.cs
using System;
using System.Collections.Generic;
using NUnit.Framework;
namespace Iteration6
    [TestFixture]
    public class TestBag
        Item sword;
        Item shield;
        Bag bag;
        Bag backpack;
        [SetUp]
        public void SetUp()
```

```
sword = new Item(["sword"], "diamond sword", "a diamond sword which
has not broken once");
            shield = new Item(["shield"], "gold shield", "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 TestBagLocateItems()
            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 TestBagFullDesc()
            Assert.That(bag.FullDescription, Is.EqualTo("In the leather bag you
can see:\n\ta diamond sword (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));
            });
       }
   }
}
```



