

World of Deez

Joe

19th November 2021

1 First Section

so we do a lot of writing

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2 Second

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```
1  package uk.insrt.coursework.zuul.behaviours;
2
3  import java.util.Random;
4
5  import uk.insrt.coursework.zuul.entities.Entity;
6  import uk.insrt.coursework.zuul.events.IEventListener;
7  import uk.insrt.coursework.zuul.events.EventTick;
8  import uk.insrt.coursework.zuul.world.Room;
9
10 public class SimpleWanderAI implements IEventListener<EventTick> {
11     private Entity entity;
12     private Room[] path;
13     private int chance;
14
15     private int index;
16     private Random random;
17
18     public SimpleWanderAI(Entity entity, Room[] path, int chance) {
19         this.entity = entity;
20         this.path = path;
21         this.chance = chance;
22
23         this.index = 0;
24         this.random = new Random();
25     }
26
27     @Override
28     public void onEvent(EventTick event) {
29         if (this.entity.getRoom() != this.path[this.index]) return;
30         if (random.nextInt(this.chance) > 0) return;
31
32         this.index = (this.index + 1) % this.path.length;
33         this.entity.setLocation(this.path[this.index]);
34     }
35 }
```

```
1  package uk.insrt.coursework.zuul.commands;
2
3  import java.util.regex.Matcher;
4
5  import uk.insrt.coursework.zuul.world.Direction;
6
7  public class Arguments {
8      private Matcher matcher;
9
10     public Arguments(Matcher matcher) {
11         this.matcher = matcher;
12     }
13
14     public String group(String group) {
15         try {
16             return this.matcher.group(group);
17         } catch (Exception e) {
18             return null;
19         }
20     }
21
22     public Direction direction() {
23         return Direction.fromString(this.group("direction"));
24     }
25 }
```

```
1  package uk.insrt.coursework.zuul.commands;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.world.World;
6
7  /**
8   * Representation of an action which can be performed by the user.
9   */
10 public abstract class Command {
11     private Pattern[] patterns;
12     private String usage;
13
14     /**
15      * Construct a new Command.
16      * @param usage Information about how to use the command
17      * @param patterns Patterns to execute this command on
18      */
19     public Command(String usage, Pattern[] patterns) {
20         this.patterns = patterns;
21         this.usage = usage;
22     }
23
24     /**
25      * Get information about how to use the command.
26      * @return String Information about how to use the command
27      */
28     public String getUsage() {
29         return this.usage;
30     }
31
32     /**
33      * Get all applicable patterns to match to execute this command.
34      * @return Regex Pattern array
35      */
36     public Pattern[] getPatterns() {
37         return this.patterns;
38     }
39
40     /**
41      * Run this command within the scope of a world and with any parsed
42      arguments.
43      * @param world Current World object
44      * @param args Arguments passed into command
45      * @return Boolean indicating whether the game loop should exit.
46      */
47     public abstract boolean run(World world, Arguments args);
48 }
```

```
1  package uk.insrt.coursework.zuul.commands;
2
3  import java.util.ArrayList;
4  import java.util.regex.Matcher;
5  import java.util.regex.Pattern;
6
7  import uk.insrt.coursework.zuul.commands.core.CommandBack;
8  import uk.insrt.coursework.zuul.commands.core.CommandGo;
9  import uk.insrt.coursework.zuul.commands.core.CommandHelp;
10 import uk.insrt.coursework.zuul.commands.core.CommandPet;
11 import uk.insrt.coursework.zuul.commands.core.CommandQuit;
12 import uk.insrt.coursework.zuul.commands.core.CommandTake;
13 import uk.insrt.coursework.zuul.commands.core.CommandUse;
14 import uk.insrt.coursework.zuul.world.World;
15
16 /**
17  * Command handler which constructs, then resolves
18  * and executes commands from an arbitrary input.
19  */
20 public class CommandManager {
21     private ArrayList<Command> commands = new ArrayList<>();
22
23     /**
24      * Construct a new CommandManager.
25      *
26      * You should only need one present at any given time.
27      */
28     public CommandManager() {
29         this.initialiseCommands();
30     }
31
32     public void registerCommand(Command command) {
33         this.commands.add(command);
34     }
35
36     public void registerCommands(Command[] commands) {
37         for (Command command : commands) {
38             this.registerCommand(command);
39         }
40     }
41
42     public ArrayList<Command> getCommands() {
43         return this.commands;
44     }
45
46     /**
47      * Initialise all the commands a player can execute.
48      */
49     private void initialiseCommands() {
50         final Command[] DEFAULT_COMMANDS = {
51             new CommandHelp(this),
52             new CommandGo(),
53             new CommandBack(),
54             new CommandPet(),
55             new CommandUse(),
56             new CommandTake(),
57             new CommandQuit()
58         };
59
60         this.registerCommands(DEFAULT_COMMANDS);
```

```
61     }
62
63     /**
64      * Interpret a given command and execute it within the scope of a given
world.
65      * @param world Current World object
66      * @param cmd Arbitrary input to match against
67      * @return Boolean indicating whether the game loop should exit.
68      */
69     public boolean runCommand(World world, String cmd) {
70         for (Command command : this.commands) {
71             for (Pattern pattern : command.getPatterns()) {
72                 Matcher matcher = pattern.matcher(cmd);
73                 if (matcher.find()) {
74                     Arguments arguments = new Arguments(matcher);
75                     return command.run(world, arguments);
76                 }
77             }
78         }
79
80         System.out.println("Not sure what you're trying to do.");
81         return false;
82     }
83 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.world.World;
8
9  public class CommandBack extends Command {
10     public CommandBack() {
11         super("back: go back to the previous room",
12             new Pattern[] {
13                 Pattern.compile("^back(?:!\\w)"),
14             });
15     }
16
17     @Override
18     public boolean run(World world, Arguments arguments) {
19         world.getPlayer().back();
20         return false;
21     }
22 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.world.Direction;
8  import uk.insrt.coursework.zuul.world.World;
9
10 public class CommandGo extends Command {
11     public CommandGo() {
12         super("go <direction>: go in a certain direction",
13             new Pattern[] {
14                 Pattern.compile("^go\\s+(?<direction>[\\w\\s]+)"),
15                 Pattern.compile("^go")
16             });
17     }
18
19     @Override
20     public boolean run(World world, Arguments arguments) {
21         Direction direction = arguments.direction();
22         if (direction == null) {
23             System.out.println("Where are you going?");
24             return false;
25         }
26
27         world.getPlayer().go(direction);
28         return false;
29     }
30 }
```



```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4  import java.util.stream.Collectors;
5
6  import uk.insrt.coursework.zuul.commands.Arguments;
7  import uk.insrt.coursework.zuul.commands.Command;
8  import uk.insrt.coursework.zuul.commands.CommandManager;
9  import uk.insrt.coursework.zuul.world.World;
10
11 public class CommandHelp extends Command {
12     private CommandManager commandManager;
13
14     public CommandHelp(CommandManager commandManager) {
15         super("help: show help menu",
16             new Pattern[] {
17                 Pattern.compile("^help(?:!\\w)")
18             });
19
20         this.commandManager = commandManager;
21     }
22
23     @Override
24     public boolean run(World world, Arguments arguments) {
25         System.out.println("You can run the following commands:");
26         System.out.println(
27             this.commandManager
28                 .getCommands()
29                 .stream()
30                 .filter(c -> !(c instanceof CommandHelp))
31                 .map(c -> "- " + c.getUsage())
32                 .collect(Collectors.joining("\n"))
33         );
34
35         return false;
36     }
37 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.entities.Entity;
8  import uk.insrt.coursework.zuul.world.World;
9
10 public class CommandPet extends Command {
11     public CommandPet() {
12         super("pet <something>: pet something in current room",
13             new Pattern[] {
14                 Pattern.compile("^pet\\s+(?<entity>[\\w\\s]+)"),
15                 Pattern.compile("^pet")
16             });
17     }
18
19     @Override
20     public boolean run(World world, Arguments arguments) {
21         String name = arguments.group("entity");
22         if (name == null) {
23             System.out.println("Pet what?");
24             return false;
25         }
26
27         Entity entity = world.findEntity(name);
28         if (entity != null) {
29             if (!entity.pet()) {
30                 System.out.println("You cannot pet " + name + ".");
31             }
32
33             return false;
34         }
35
36         System.out.println("You look around for " + name + " but can't find
37 anything.");
38         return false;
39     }
40 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.world.World;
8
9  public class CommandQuit extends Command {
10     public CommandQuit() {
11         super("quit: quit the game",
12             new Pattern[] {
13                 Pattern.compile("^quit(?:!\\w)"),
14             });
15     }
16
17     @Override
18     public boolean run(World world, Arguments arguments) {
19         return true;
20     }
21 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.entities.Entity;
8  import uk.insrt.coursework.zuul.world.World;
9
10 public class CommandTake extends Command {
11     public CommandTake() {
12         super("take <something>: put something in your bag",
13             new Pattern[] {
14                 Pattern.compile("^take\\s+(?<entity>[\\w\\s]+)"),
15                 Pattern.compile("^take")
16             });
17     }
18
19     @Override
20     public boolean run(World world, Arguments arguments) {
21         String name = arguments.group("entity");
22         if (name == null) {
23             System.out.println("Take what?");
24             return false;
25         }
26
27         Entity entity = world.findEntity(name);
28         if (entity != null) {
29             if (entity.take(world.getPlayer())) {
30                 System.out.println("You take " + name + " and put it in your
31 bag.");
32             } else {
33                 System.out.println("You cannot take " + name + ".");
34             }
35             return false;
36         }
37
38         System.out.println("You look around for " + name + " but can't find
39 anything.");
40         return false;
41     }
42 }
```

```
1  package uk.insrt.coursework.zuul.commands.core;
2
3  import java.util.regex.Pattern;
4
5  import uk.insrt.coursework.zuul.commands.Arguments;
6  import uk.insrt.coursework.zuul.commands.Command;
7  import uk.insrt.coursework.zuul.entities.Entity;
8  import uk.insrt.coursework.zuul.world.World;
9
10 public class CommandUse extends Command {
11     public CommandUse() {
12         super("use <something>: use an object or something in your inventory",
13             new Pattern[] {
14                 Pattern.compile("^use\\s+(?<entity>[\\w\\s]+)"),
15                 Pattern.compile("^use")
16             });
17     }
18
19     @Override
20     public boolean run(World world, Arguments arguments) {
21         String name = arguments.group("entity");
22         if (name == null) {
23             System.out.println("Use what?");
24             return false;
25         }
26
27         Entity entity = world.findEntity(name);
28         if (entity != null) {
29             if (!entity.use(world.getPlayer())) {
30                 System.out.println("You cannot use " + name + ".");
31             }
32
33             return false;
34         }
35
36         System.out.println("You look around for " + name + " but can't find
37 anything.");
38         return false;
39     }
40 }
```

```

1  package uk.insrt.coursework.zuul.content.campaign;
2
3  import java.util.ArrayList;
4  import java.util.stream.Collectors;
5
6  import uk.insrt.coursework.zuul.behaviours.SimpleWanderAI;
7  import uk.insrt.coursework.zuul.content.campaign.rooms.RoomApartmentsHome;
8  import uk.insrt.coursework.zuul.content.campaign.rooms.RoomApartmentsReception;
9  import uk.insrt.coursework.zuul.content.campaign.rooms.RoomBackAlley;
10 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomCityCentre;
11 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomCoastline;
12 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomForest;
13 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomMainlandCoastline;
14 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomMedicalCentreOffice;
15 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomMedicalCentreRecepti
on;
16 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomShop;
17 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomStreet;
18 import uk.insrt.coursework.zuul.content.campaign.rooms.RoomWormHole;
19 import uk.insrt.coursework.zuul.entities.Entity;
20 import uk.insrt.coursework.zuul.entities.EntityCat;
21 import uk.insrt.coursework.zuul.entities.EntityPlayer;
22 import uk.insrt.coursework.zuul.events.EventEntityEnteredRoom;
23 import uk.insrt.coursework.zuul.events.EventEntityLeftRoom;
24 import uk.insrt.coursework.zuul.events.IEventListener;
25 import uk.insrt.coursework.zuul.world.Room;
26 import uk.insrt.coursework.zuul.world.World;
27
28 // https://democracy.york.gov.uk/documents/s2116/
Annex%20C%20REcycling%20Report%20frnweights2005.pdf
29 // https://www.google.com/maps/@50.4293559,18.9742453,16.12z
30 // https://twitter.com/Yarung3/status/1258670295520628736/photo/1
31 // https://twitter.com/jgilleard/status/1242354985351786497
32 // [3:02] https://brand-new-animal.fandom.com/wiki/Runaway_Raccoon
33
34 public class CampaignWorld extends World {
35     private ArrayList<Room> visitedRooms;
36
37     public CampaignWorld() {
38         super();
39         this.visitedRooms = new ArrayList<>();
40
41         this.buildWorld();
42         this.spawnEntities();
43         this.registerEvents();
44     }
45
46     public boolean hasVisited(Room room) {
47         return this.visitedRooms.contains(room);
48     }
49
50     private void buildWorld() {
51         final Room[] rooms = {
52             new RoomCityCentre(this),
53             new RoomStreet(this),
54             new RoomShop(this),
55             new RoomBackAlley(this),
56             new RoomApartmentsReception(this),
57             new RoomApartmentsHome(this),
58             new RoomMedicalCentreReception(this),

```

```

59         new RoomMedicalCentreOffice(this),
60         new RoomCoastline(this),
61         new RoomMainlandCoastline(this),
62         new RoomForest(this),
63         new RoomWormHole(this)
64     };
65
66     for (Room room : rooms) {
67         this.addRoom(room);
68     }
69
70     this.linkRooms();
71 }
72
73 private void spawnEntities() {
74     for (Room room : this.rooms.values()) {
75         room.spawnEntities();
76     }
77 }
78
79 /**
80  * Register all the game logic
81  */
82 private void registerEvents() {
83     super.registerDefaultEvents();
84
85     this.eventSystem.addListener(EventEntityEnteredRoom.class, (IEventListener<EventEntityEnteredRoom>) this.getRoom("Worm Hole"));
86     this.eventSystem.addListener(EventEntityEnteredRoom.class,
87         (EventEntityEnteredRoom event) -> {
88             Entity entity = event.getEntity();
89             if (entity instanceof EntityPlayer) {
90                 Room room = entity.getRoom();
91
92                 // Mark current room as previously visited.
93                 this.visitedRooms.add(room);
94
95                 // When we enter a new room, list what we can see.
96                 String entities = this.getEntitiesInRoom(entity.getRoom())
97                     .stream()
98                     .filter(e -> !(e instanceof EntityPlayer))
99                     .map(e -> "- " + e.describe())
100                     .collect(Collectors.joining("\n"));
101
102                 if (entities.length() > 0) {
103                     System.out.println("You can see:\n" + entities);
104                 }
105             } else {
106                 // If another entity enters the room,
107                 // conditionally mention this to the player.
108                 EntityPlayer player = this.getPlayer();
109                 if (entity.getRoom() == player.getRoom()) {
110                     if (entity instanceof EntityCat) {
111                         System.out.println("\nA cat has wandered in.");
112                     }
113                 }
114             }
115         });
116
117     this.eventSystem.addListener(EventEntityLeftRoom.class,

```

```
118         (EventEntityLeftRoom event) -> {
119             Entity entity = event.getEntity();
120             if (entity instanceof EntityPlayer) return;
121
122             Room room = event.getRoom();
123             if (room != this.player.getRoom()) return;
124
125             // If another entity leaves the room,
126             // conditionally mention this to the player.
127             if (entity instanceof EntityCat) {
128                 System.out.println("\nYou see a cat leave.");
129             }
130         });
131     }
132
133     @Override
134     public void spawnPlayer() {
135         this.player.setLocation(this.rooms.get("City Centre"));
136     }
137 }
```



```
1  package uk.insrt.coursework.zuul.content.campaign.entities;
2
3  import uk.insrt.coursework.zuul.entities.Entity;
4  import uk.insrt.coursework.zuul.entities.EntityObject;
5  import uk.insrt.coursework.zuul.entities.actions.IActionUse;
6  import uk.insrt.coursework.zuul.events.EventTick;
7  import uk.insrt.coursework.zuul.world.Location;
8  import uk.insrt.coursework.zuul.world.World;
9
10 public class EntityBed extends EntityObject implements IActionUse {
11     public EntityBed(World world, Location location) {
12         super(world, location, 80, new String[] { "bed" }, "Bed");
13     }
14
15     public void use(Entity target) {
16         // for example, we could move the world forwards by 20 ticks
17         for (int i=0;i<20;i++) {
18             world.emit(new EventTick());
19         }
20
21         System.out.println("You take a nap.");
22     }
23 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.entities;
2
3  import uk.insrt.coursework.zuul.entities.Entity;
4  import uk.insrt.coursework.zuul.entities.actions.IActionUse;
5  import uk.insrt.coursework.zuul.world.Location;
6  import uk.insrt.coursework.zuul.world.Room;
7  import uk.insrt.coursework.zuul.world.World;
8
9  public class EntityBoat extends Entity implements IActionUse {
10     private Room destination;
11
12     public EntityBoat(World world, Location location, Room destination) {
13         super(world, location, 200);
14         this.destination = destination;
15     }
16
17     @Override
18     public String[] getAliases() {
19         return new String[] { "boat" };
20     }
21
22     @Override
23     public String describe() {
24         return "boat";
25     }
26
27     public void use(Entity target) {
28         target.setLocation(this.destination);
29     }
30
31     @Override
32     public boolean pet() {
33         return false;
34     }
35 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.content.campaign.entities.EntityBed;
4  import uk.insrt.coursework.zuul.entities.EntityObject;
5  import uk.insrt.coursework.zuul.world.Direction;
6  import uk.insrt.coursework.zuul.world.Room;
7  import uk.insrt.coursework.zuul.world.World;
8
9  public class RoomApartmentsHome extends Room {
10     public RoomApartmentsHome(World world) {
11         super(world, "Apartments: Home");
12     }
13
14     public String describe() {
15         return this.getName();
16     }
17
18     protected void setupDirections() {
19         this.setAdjacent(Direction.DOWN, this.getWorld().getRoom("Apartments:
Reception"));
20     }
21
22     public void spawnEntities() {
23         World world = this.getWorld();
24
25         world.spawnEntity("bed", new EntityBed(world, this.toLocation()));
26         world.spawnEntity("laptop", new EntityObject(world, this.toLocation(), 2,
new String[] { "laptop" }, "Laptop"));
27     }
28 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomApartmentsReception extends Room {
8      public RoomApartmentsReception(World world) {
9          super(world, "Apartments: Reception");
10     }
11
12     public String describe() {
13         return this.getName();
14     }
15
16     protected void setupDirections() {
17         World world = this.getWorld();
18         this.setAdjacent(Direction.NORTH, world.getRoom("Street"));
19         this.setAdjacent(Direction.EAST, world.getRoom("City Centre"));
20         this.setAdjacent(Direction.UP, world.getRoom("Apartments: Home"));
21     }
22 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomBackAlley extends Room {
8      public RoomBackAlley(World world) {
9          super(world, "Back Alley");
10     }
11
12     public String describe() {
13         return this.getName();
14     }
15
16     protected void setupDirections() {
17         this.setAdjacent(Direction.SOUTH, this.getWorld().getRoom("City Centre"))
18     }
19 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.content.campaign.CampaignWorld;
4  import uk.insrt.coursework.zuul.entities.EntityCat;
5  import uk.insrt.coursework.zuul.world.Direction;
6  import uk.insrt.coursework.zuul.world.Room;
7  import uk.insrt.coursework.zuul.world.World;
8
9  public class RoomCityCentre extends Room {
10     public RoomCityCentre(World world) {
11         super(world, "City Centre");
12     }
13
14     public String describe() {
15         if (((CampaignWorld) this.getWorld()).hasVisited(this)) {
16             return "you've been here before";
17         }
18
19         return "something something long description.";
20     }
21
22     protected void setupDirections() {
23         World world = this.getWorld();
24         this.setAdjacent(Direction.NORTH, world.getRoom("Back Alley"));
25         this.setAdjacent(Direction.NORTH_WEST, world.getRoom("Street"));
26         this.setAdjacent(Direction.WEST, world.getRoom("Apartments: Reception"));
27         this.setAdjacent(Direction.SOUTH, world.getRoom("Coastline"));
28     }
29
30     public void spawnEntities() {
31         World world = this.getWorld();
32
33         EntityCat cat = new EntityCat(world, this.toLocation());
34         world.spawnEntity("cat", cat);
35         cat.useWanderAI(
36             new Room[] {
37                 world.getRoom("City Centre"),
38                 world.getRoom("Street"),
39                 world.getRoom("Shop"),
40                 world.getRoom("Street"),
41                 world.getRoom("City Centre"),
42                 world.getRoom("Back Alley"),
43                 world.getRoom("City Centre")
44             },
45             8
46         );
47     }
48 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.content.campaign.entities.EntityBoat;
4  import uk.insrt.coursework.zuul.world.Direction;
5  import uk.insrt.coursework.zuul.world.Room;
6  import uk.insrt.coursework.zuul.world.World;
7
8  public class RoomCoastline extends Room {
9      public RoomCoastline(World world) {
10         super(world, "Coastline");
11     }
12
13     public String describe() {
14         return this.getName();
15     }
16
17     protected void setupDirections() {
18         this.setAdjacent(Direction.NORTH, this.getWorld().getRoom("City Centre"))
;
19     }
20
21     public void spawnEntities() {
22         World world = this.getWorld();
23         world.spawnEntity("boat1",
24             new EntityBoat(world, this.toLocation(),
25                 world.getRoom("Mainland: Coastline")));
26     }
27 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomForest extends Room {
8      public RoomForest(World world) {
9          super(world, "Forest");
10     }
11
12     public String describe() {
13         return this.getName();
14     }
15
16     protected void setupDirections() {
17         World world = this.getWorld();
18         this.setAdjacent(Direction.NORTH, world.getRoom("Mainland: Coastline"));
19         this.setAdjacent(Direction.EAST, world.getRoom("Worm Hole"));
20     }
21 }
```



```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.content.campaign.entities.EntityBoat;
4  import uk.insrt.coursework.zuul.world.Direction;
5  import uk.insrt.coursework.zuul.world.Room;
6  import uk.insrt.coursework.zuul.world.World;
7
8  public class RoomMainlandCoastline extends Room {
9      public RoomMainlandCoastline(World world) {
10         super(world, "Mainland: Coastline");
11     }
12
13     public String describe() {
14         return this.getName();
15     }
16
17     protected void setupDirections() {
18         this.setAdjacent(Direction.SOUTH, this.getWorld().getRoom("Forest"));
19     }
20
21     public void spawnEntities() {
22         World world = this.getWorld();
23         world.spawnEntity("boat2",
24             new EntityBoat(world, this.toLocation(),
25                 world.getRoom("Coastline")));
26     }
27 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomMedicalCentreOffice extends Room {
8      public RoomMedicalCentreOffice(World world) {
9          super(world, "Medical Centre: Office");
10     }
11
12     public String describe() {
13         return "You find yourself at the Medical Centre's office.\nYou
definitely shouldn't be here...";
14     }
15
16     protected void setupDirections() {
17         this.setAdjacent(Direction.UP, this.getWorld().getRoom("Medical Centre:
Reception"));
18     }
19 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.entities.EntityNPC;
4  import uk.insrt.coursework.zuul.world.Direction;
5  import uk.insrt.coursework.zuul.world.Room;
6  import uk.insrt.coursework.zuul.world.World;
7
8  public class RoomMedicalCentreReception extends Room {
9      public RoomMedicalCentreReception(World world) {
10         super(world, "Medical Centre: Reception");
11     }
12
13     public String describe() {
14         return "You're now at the Medical Centre's reception.";
15     }
16
17     protected void setupDirections() {
18         World world = this.getWorld();
19         this.setAdjacent(Direction.EAST, world.getRoom("Street"));
20         this.setAdjacent(Direction.DOWN, world.getRoom("Medical Centre: Office"));
21     };
22
23     public boolean canLeave(Direction direction) {
24         World world = this.getWorld();
25         if (direction == Direction.DOWN) {
26             if (world.getEntitiesInRoom(this)
27                 .contains(world.getEntity("guard1"))) {
28                 System.out.println("There is security watching the stairs,
29 there's no way to get past them.");
30                 return false;
31             }
32         }
33         return true;
34     }
35
36     public void spawnEntities() {
37         World world = this.getWorld();
38         world.spawnEntity("guard1", new EntityNPC(world, this.toLocation()) {
39             @Override
40             public String[] getAliases() {
41                 return new String[] { "security guard", "guard" };
42             }
43
44             @Override
45             public String describe() {
46                 return "guard";
47             }
48         });
49     }
50 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomShop extends Room {
8      public RoomShop(World world) {
9          super(world, "Shop");
10     }
11
12     public String describe() {
13         return this.getName();
14     }
15
16     protected void setupDirections() {
17         this.setAdjacent(Direction.SOUTH, this.getWorld().getRoom("Street"));
18     }
19 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Room;
5  import uk.insrt.coursework.zuul.world.World;
6
7  public class RoomStreet extends Room {
8      public RoomStreet(World world) {
9          super(world, "Street");
10     }
11
12     public String describe() {
13         return this.getName();
14     }
15
16     protected void setupDirections() {
17         World world = this.getWorld();
18         this.setAdjacent(Direction.SOUTH, world.getRoom("Apartments: Reception"));
19         this.setAdjacent(Direction.EAST, world.getRoom("City Centre"));
20         this.setAdjacent(Direction.NORTH, world.getRoom("Shop"));
21         this.setAdjacent(Direction.WEST, world.getRoom("Medical Centre:
Reception"));
22     }
23 }
```

```

1  package uk.insrt.coursework.zuul.content.campaign.rooms;
2
3  import java.util.Random;
4
5  import uk.insrt.coursework.zuul.entities.Entity;
6  import uk.insrt.coursework.zuul.events.EventEntityEnteredRoom;
7  import uk.insrt.coursework.zuul.events.IEventListener;
8  import uk.insrt.coursework.zuul.world.Room;
9  import uk.insrt.coursework.zuul.world.World;
10
11  public class RoomWormHole extends Room implements IEventListener<EventEntityEnte
redRoom> {
12      public RoomWormHole(World world) {
13          super(world, "Worm Hole");
14      }
15
16      public String describe() {
17          return this.getName();
18      }
19
20      protected void setupDirections() {}
21
22      @Override
23      public void onEvent(EventEntityEnteredRoom event) {
24          Entity entity = event.getEntity();
25          Room room = entity.getRoom();
26          if (room != this) return;
27          event.stopPropagation();
28
29          final Random random = new Random();
30          final String[] locations = {
31              "City Centre",
32              "Coastline",
33              "Mainland: Coastline",
34              "Forest",
35              "Street",
36              "Back Alley"
37          };
38
39          System.out.println("\nYou step into the worm hole...\n");
40
41          try {
42              Thread.sleep(1000);
43          } catch (Exception e) { }
44
45          final int WIDTH = 42;
46
47          // Transport animation, this will take 1800 ms.
48          for (int i=0;i<5;i++) {
49              System.out.println("*".repeat(i*3) + "\\ " + " ".repeat(WIDTH - i * 6
- 2) + "/" + "*".repeat(i*3));
50              try {
51                  Thread.sleep(60);
52              } catch (Exception e) { }
53          }
54
55          for (int i=0;i<30;i++) {
56              var out = "";
57              for (int j=0;j<WIDTH;j++) {
58                  out += random.nextInt(8) == 0 ? "*" : " ";

```

```
59         }
60
61         System.out.println(out);
62
63         try {
64             Thread.sleep(40);
65         } catch (Exception e) { }
66     }
67
68     for (int i=5;i>0;i--) {
69         System.out.println("*.repeat(i*3) + "/" + " ".repeat(WIDTH - i * 6 -
2) + "\\\" + *.repeat(i*3));
70         try {
71             Thread.sleep(60);
72         } catch (Exception e) { }
73     }
74
75     System.out.println();
76
77     String location = locations[random.nextInt(locations.length)];
78     Room target = this.getWorld().getRoom(location);
79     entity.setLocation(target);
80 }
81 }
```

```
1  package uk.insrt.coursework.zuul.content.campaign;  
2  
3  public class StoryFlags {  
4  
5  }
```



```
1  package uk.insrt.coursework.zuul.entities.actions;
2
3  import uk.insrt.coursework.zuul.entities.Entity;
4
5  public interface IActionUse {
6      /**
7       * Use this entity.
8       * @param target The Entity taking this entity.
9       * @return Whether this entity can be used.
10     */
11     public void use(Entity target);
12 }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import uk.insrt.coursework.zuul.events.EventEntityEnteredRoom;
4  import uk.insrt.coursework.zuul.events.EventEntityLeftRoom;
5  import uk.insrt.coursework.zuul.world.Location;
6  import uk.insrt.coursework.zuul.world.Room;
7  import uk.insrt.coursework.zuul.world.World;
8
9  /**
10   * Representation of any Entity in the World.
11   *
12   * Any living beings, items, or otherwise things that
13   * exist in the world are considered an Entity. Each
14   * Entity also has an Inventory so things may be stored
15   * inside of it.
16   */
17  public abstract class Entity {
18      protected World world;
19      protected Inventory inventory;
20
21      private Location location;
22      private int weight;
23
24      /**
25       * Construct a new Entity.
26       * @param world Current World object
27       * @param location Initial Location of this Entity
28       * @param weight The weight (in kg) of this Entity
29       */
30      public Entity(World world, Location location, int weight) {
31          this.world = world;
32          this.location = location;
33          this.inventory = new Inventory();
34          this.weight = weight;
35      }
36
37      /**
38       * Construct a new Entity.
39       *
40       * Weight value is set to Integer.MAX_VALUE.
41       * @param world Current World object
42       * @param location Initial Location of this Entity
43       */
44      public Entity(World world, Location location) {
45          this(world, location, Integer.MAX_VALUE);
46      }
47
48      /**
49       * Get this Entity's weight.
50       * @return Weight (in kg)
51       */
52      public int getWeight() {
53          return this.weight;
54      }
55
56      /**
57       * Get the Inventory that this Entity holds.
58       * @return Inventory
59       */
60      public Inventory getInventory() {
```

```
61         return this.inventory;
62     }
63
64     public World getWorld() {
65         return this.world;
66     }
67
68     /**
69      * Get the Room that this Entity is currently in.
70      * @return Room
71      */
72     public Room getRoom() {
73         return this.location.getRoom();
74     }
75
76     /**
77      * Get the Inventory that this Entity is currently in.
78      * @return Inventory
79      */
80     public Inventory getInventoryWithin() {
81         return this.location.getInventory();
82     }
83
84     /**
85      * Move the Entity into a Room.
86      * @param room Destination Room
87      */
88     public void setLocation(Room room) {
89         Inventory inventory = this.location.getInventory();
90         if (inventory != null) inventory.remove(this);
91
92         Room previousRoom = this.getRoom();
93         if (previousRoom != null) this.world.emit(new EventEntityLeftRoom(this,
previousRoom));
94
95         this.location.setLocation(room);
96         this.world.emit(new EventEntityEnteredRoom(this));
97     }
98
99     /**
100      * Move the Entity into an Inventory.
101      * @param inventory Destination Inventory
102      * @return Whether we successfully moved the entity into the inventory.
103      */
104     public boolean setLocation(Inventory inventory) {
105         if (inventory.add(this)) {
106             this.location.setLocation(inventory);
107             return true;
108         }
109
110         return false;
111     }
112
113     /**
114      * Take this entity.
115      * @param target The Entity taking this entity
116      * @return Whether we managed to take this entity.
117      */
118     public boolean take(Entity target) {
119         Inventory inventory = target.getInventory();
```

```
120         return this.setLocation(inventory);
121     }
122
123     /**
124      * Get names that this Entity can be called by.
125      * @return String array of names for this Entity
126      */
127     public abstract String[] getAliases();
128
129     /**
130      * Get a description of this Entity.
131      * @return String describing the Entity
132      */
133     public abstract String describe();
134
135     /**
136      * Pet this entity.
137      * @return Whether this entity can be pet.
138      */
139     public abstract boolean pet();
140 }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import uk.insrt.coursework.zuul.behaviours.SimpleWanderAI;
4  import uk.insrt.coursework.zuul.world.Location;
5  import uk.insrt.coursework.zuul.world.Room;
6  import uk.insrt.coursework.zuul.world.World;
7
8  /**
9   * Cat entity which wanders around the map.
10  */
11  public class EntityCat extends Entity {
12      public EntityCat(World world, Location startingLocation) {
13          super(world, startingLocation, 5);
14      }
15
16      @Override
17      public String[] getAliases() {
18          return new String[] {
19              "cat",
20              "the cat"
21          };
22      }
23
24      @Override
25      public String describe() {
26          return "A black cat";
27      }
28
29      @Override
30      public boolean pet() {
31          System.out.println("You pet the cat.");
32          return true;
33      }
34
35      public void useWanderAI(Room[] rooms, int chance) {
36          this.getWorld()
37              .getEventSystem()
38              .onTick(new SimpleWanderAI(this, rooms, chance));
39      }
40  }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import uk.insrt.coursework.zuul.world.Location;
4  import uk.insrt.coursework.zuul.world.World;
5
6  /**
7   * NPC entity which provides dialog.
8   */
9  public abstract class EntityNPC extends Entity {
10     public EntityNPC(World world, Location startingLocation) {
11         super(world, startingLocation, 75);
12     }
13
14     @Override
15     public boolean pet() {
16         return false;
17     }
18 }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import uk.insrt.coursework.zuul.world.Location;
4  import uk.insrt.coursework.zuul.world.World;
5
6  /**
7   * Generic object class which avoids some boilerplate.
8   * Use this for entities which are guaranteed to never change.
9   */
10 public class EntityObject extends Entity {
11     private String description;
12     private String[] aliases;
13
14     public EntityObject(World world, Location location, int weight, String[] ali
ases, String description) {
15         super(world, location, weight);
16         this.description = description;
17         this.aliases = aliases;
18     }
19
20     @Override
21     public String describe() {
22         return this.description;
23     }
24
25     @Override
26     public String[] getAliases() {
27         return this.aliases;
28     }
29
30     @Override
31     public boolean pet() {
32         return false;
33     }
34 }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import uk.insrt.coursework.zuul.world.Direction;
4  import uk.insrt.coursework.zuul.world.Location;
5  import uk.insrt.coursework.zuul.world.Room;
6  import uk.insrt.coursework.zuul.world.World;
7
8  /**
9   * Player entity which we can control and move around.
10  */
11  public class EntityPlayer extends Entity {
12      private Room previousRoom;
13      private Direction retreatingDirection;
14
15      public EntityPlayer(World world) {
16          super(world, new Location(), 70);
17          this.inventory.setMaxWeight(35);
18      }
19
20      /**
21       * Override method for setLocation which
22       * keeps track of previous room.
23       */
24      @Override
25      public void setLocation(Room room) {
26          this.previousRoom = this.getRoom();
27          super.setLocation(room);
28      }
29
30      @Override
31      public String[] getAliases() {
32          return new String[] {
33              "player", "me"
34          };
35      }
36
37      @Override
38      public String describe() {
39          // We may skip defining how the Player looks,
40          // this is because EntityPlayer is ignored
41          // when looking around the room.
42          return "";
43      }
44
45      @Override
46      public boolean take(Entity target) {
47          return false;
48      }
49
50      @Override
51      public boolean pet() {
52          return false;
53      }
54
55      /**
56       * Move in a direction as instructed by command.
57       * @param direction Target Direction
58       */
59      public void go(Direction direction) {
60          Room room = this.getRoom();
```



```
61         if (room == null) {
62             System.out.println("You appear to be trapped.");
63             return;
64         }
65
66         if (!room.canLeave(direction)) return;
67
68         Room destination = room.getAdjacent(direction);
69         if (destination == null) {
70             System.out.println("You cannot go this way.");
71             return;
72         }
73
74         this.retreatingDirection = direction.flip();
75         this.setLocation(destination);
76     }
77
78     /**
79      * Move to the previous room the player was in.
80      */
81     public void back() {
82         if (this.retreatingDirection == null) {
83             System.out.println("Nowhere to go back to!");
84             return;
85         }
86
87         if (this.getRoom().hasExit(this.retreatingDirection)) {
88             this.setLocation(this.previousRoom);
89             this.retreatingDirection = this.retreatingDirection.flip();
90         } else {
91             System.out.println("Cannot leave the room this way.");
92         }
93     }
94 }
```

```
1  package uk.insrt.coursework.zuul.entities;
2
3  import java.util.ArrayList;
4
5  /**
6   * Representation of an Entity's inventory
7   * and what they are holding.
8   */
9  public class Inventory {
10     private ArrayList<Entity> items = new ArrayList<>();
11     private int maxWeight;
12
13     /**
14      * Construct a new Inventory.
15      */
16     public Inventory() {
17         super();
18         this.maxWeight = 0;
19     }
20
21     /**
22      * Set the max weight that can be carried in this inventory.
23      * @param maxWeight Max weight (in kg)
24      */
25     public void setMaxWeight(int maxWeight) {
26         this.maxWeight = maxWeight;
27     }
28
29     /**
30      * Get the current weight of this inventory.
31      * @return Weight (in kg)
32      */
33     private int getWeight() {
34         return this
35             .items
36             .stream()
37             .mapToInt(Entity::getWeight)
38             .sum();
39     }
40
41     /**
42      * Add an entity to this inventory.
43      *
44      * There must be sufficient space for the entity.
45      * @param entity Target Entity
46      * @return Whether we successfully added the new entity.
47      */
48     public boolean add(Entity entity) {
49         if (this.getWeight() + entity.getWeight() > this.maxWeight) {
50             return false;
51         }
52
53         this.items.add(entity);
54         return true;
55     }
56
57     /**
58      * Remove an entity from this inventory.
59      * @param entity Target Entity
60      * @return Whether there was any change to the inventory.
```

```
61      */
62      public boolean remove(Entity entity) {
63          return this.items.remove(entity);
64      }
65  }
```

```
1  package uk.insrt.coursework.zuul.events;
2
3  /**
4   * Represents a single event fired from
5   * any source to be consumed by anything.
6   */
7  public class Event {
8      private boolean propagating = true;
9
10     public boolean canRun() {
11         return this.propagating;
12     }
13
14     public void stopPropagation() {
15         this.propagating = false;
16     }
17 }
```

```
1  package uk.insrt.coursework.zuul.events;
2
3  import uk.insrt.coursework.zuul.entities.Entity;
4
5  /**
6   * Event fired when an Entity enters a room.
7   */
8  public class EventEntityEnteredRoom extends Event {
9      private Entity entity;
10
11     /**
12      * Construct a new EntityEnteredRoom Event.
13      * @param entity Target Entity
14      */
15     public EventEntityEnteredRoom(Entity entity) {
16         this.entity = entity;
17     }
18
19     /**
20      * Get the Entity relating to this event.
21      * @return Entity
22      */
23     public Entity getEntity() {
24         return this.entity;
25     }
26 }
```

```
1  package uk.insrt.coursework.zuul.events;
2
3  import uk.insrt.coursework.zuul.entities.Entity;
4  import uk.insrt.coursework.zuul.world.Room;
5
6  /**
7   * Event fired when an Entity enters a room.
8   */
9  public class EventEntityLeftRoom extends Event {
10     private Entity entity;
11     private Room room;
12
13     /**
14      * Construct a new EntityLeftRoom Event.
15      * @param entity Target Entity
16      * @param room Room the entity left
17      */
18     public EventEntityLeftRoom(Entity entity, Room room) {
19         this.entity = entity;
20         this.room = room;
21     }
22
23     /**
24      * Get the Entity relating to this event.
25      * @return Entity
26      */
27     public Entity getEntity() {
28         return this.entity;
29     }
30
31     /**
32      * Get the Room relating to this event.
33      * @return Room
34      */
35     public Room getRoom() {
36         return this.room;
37     }
38 }
```

```
1  package uk.insrt.coursework.zuul.events;
2
3  /**
4   * Event fired when an arbitrary command is about to be run.
5   */
6  public class EventProcessCommand extends Event {
7      private String cmd;
8
9      /**
10       * Construct a new EventProcessCommand Event.
11       * @param cmd Target command
12       */
13     public EventProcessCommand(String cmd) {
14         this.cmd = cmd;
15     }
16
17     /**
18      * Set command for this event.
19      * @param cmd Overwrite current command
20      */
21     public void setCommand(String cmd) {
22         this.cmd = cmd;
23     }
24
25     /**
26      * Get the command relating to this event.
27      * @return Arbitrary command
28      */
29     public String getCommand() {
30         return this.cmd;
31     }
32 }
```

```

1  package uk.insrt.coursework.zuul.events;
2
3  import java.util.HashMap;
4  import java.util.HashSet;
5  import java.util.LinkedHashSet;
6
7  /**
8   * Event system which manages taking in events
9   * from different sources and handles them
10  * by firing callbacks on event listeners.
11  */
12  public class EventSystem {
13      private HashMap<Class<? extends Event>, LinkedHashSet<IEventListener<? extends Event>>> listeners = new HashMap<>();
14
15      /**
16       * Get existing Event listener list or create a new one if not exists.
17       * @param event Event
18       * @return Set of event listeners
19       */
20      private HashSet<IEventListener<? extends Event>> getList(Class<? extends Event> event) {
21          var list = this.listeners.get(event);
22          if (list == null) {
23              list = new LinkedHashSet<>();
24              this.listeners.put(event, list);
25          }
26
27          return list;
28      }
29
30      /**
31       * Add a new event listener to this system.
32       * @param <E> Generic Event type
33       * @param event Event to remove from
34       * @param listener Event listener callback
35       */
36      public<E extends Event> void addListener(Class<E> event, IEventListener<E> listener) {
37          this.getList(event).add(listener);
38      }
39
40      /**
41       * Remove an new event listener from this system.
42       * @param <E> Generic Event type
43       * @param event Event to remove from
44       * @param listener Event listener callback
45       */
46      public<E extends Event> void removeListener(Class<E> event, IEventListener<E> listener) {
47          this.getList(event).remove(listener);
48      }
49
50      /**
51       * Shorthand for addListener(EventTick.class, listener)
52       * @param listener Event listener callback
53       */
54      public void onTick(IEventListener<EventTick> listener) {
55          this.addListener(EventTick.class, listener);
56      }

```



```
57
58  /**
59   * Emit an Event.
60   * @param <E> Generic Event type
61   * @param event Event to emit
62   */
63  @SuppressWarnings("unchecked")
64  public <E extends Event> void emit(E event) {
65      var listeners = this.listeners.get(event.getClass());
66      if (listeners == null) return;
67
68      for (@SuppressWarnings("rawtypes") IEventListener listener : listeners) {
69          listener.onEvent(event);
70          // Previously, there was a try catch ClassCastException
71          // but I've since constricted the types on `addListener`
72          // and `removeListener` so this should never happen.
73
74          if (!event.canRun())
75              break;
76      }
77  }
78 }
```

```
1  package uk.insrt.coursework.zuul.events;  
2  
3  public class EventTick extends Event {}
```

```
1  package uk.insrt.coursework.zuul.events;
2
3  public interface IEventListener<E extends Event> {
4      public void onEvent(E event);
5  }
```

```
1  package uk.insrt.coursework.zuul;
2
3  import java.util.Scanner;
4
5  import uk.insrt.coursework.zuul.commands.CommandManager;
6  import uk.insrt.coursework.zuul.content.campaign.CampaignWorld;
7  import uk.insrt.coursework.zuul.events.EventProcessCommand;
8  import uk.insrt.coursework.zuul.events.EventTick;
9  import uk.insrt.coursework.zuul.world.World;
10
11 public class Game {
12     private World world;
13     private CommandManager commands;
14
15     private Scanner reader;
16
17     public static void main(String[] args) {
18         new Game().start();
19     }
20
21     public Game() {
22         this.world = new CampaignWorld();
23         this.commands = new CommandManager();
24         this.reader = new Scanner(System.in);
25     }
26
27     public void start() {
28         this.world.spawnPlayer();
29
30         while (true) {
31             System.out.print("\n$ ");
32             String input = this.reader.nextLine().toLowerCase();
33             System.out.print("\n---\n\n");
34
35             EventProcessCommand event = new EventProcessCommand(input);
36             this.world.emit(event);
37
38             if (this.commands.runCommand(this.world, event.getCommand())) {
39                 break;
40             }
41
42             this.world.emit(new EventTick());
43         }
44
45         System.out.println("you were game ended");
46     }
47 }
```

```

1  package uk.insrt.coursework.zuul.world;
2
3  import java.util.Arrays;
4  import java.util.List;
5
6  /**
7   * Enum which represents a Cardinal direction.
8   */
9  public enum Direction {
10     NORTH(new String[] { "N" }),
11     NORTH_EAST(new String[] { "NE", "NORTH EAST" }),
12     EAST(new String[] { "E" }),
13     SOUTH_EAST(new String[] { "SE", "SOUTH EAST" }),
14     SOUTH(new String[] { "S" }),
15     SOUTH_WEST(new String[] { "SW", "SOUTH WEST" }),
16     WEST(new String[] { "W" }),
17     NORTH_WEST(new String[] { "NW", "NORTH WEST" }),
18
19     UP(new String[] {}),
20     DOWN(new String[] {});
21
22     private List<String> aliases;
23
24     /**
25      * Consturct a new Direction
26      * @param aliases Alternative ways to refer to this Direction
27      */
28     private Direction(String[] aliases) {
29         this.aliases = Arrays.asList(aliases);
30     }
31
32     /**
33      * Check whether this Direction matches the given aliases.
34      * @param direction Direction in String format
35      * @return Whether it matches.
36      */
37     private boolean matches(String direction) {
38         return this.aliases.contains(direction);
39     }
40
41     /**
42      * Flip a given Direction in the opposite direction.
43      * @return Direction in the opposite direction.
44      */
45     public Direction flip() {
46         switch (this) {
47             default:
48                 case NORTH: return Direction.SOUTH;
49                 case NORTH_EAST: return Direction.SOUTH_WEST;
50                 case EAST: return Direction.WEST;
51                 case SOUTH_EAST: return Direction.NORTH_WEST;
52                 case SOUTH: return Direction.NORTH;
53                 case SOUTH_WEST: return Direction.NORTH_EAST;
54                 case WEST: return Direction.EAST;
55                 case NORTH_WEST: return Direction.SOUTH_EAST;
56                 case UP: return Direction.DOWN;
57                 case DOWN: return Direction.UP;
58         }
59     }
60

```

```
61     /**
62      * Convert an arbitrary String to a Direction.
63      * @param direction Raw string representing a Direction
64      * @return Direction or null from given string
65      */
66     public static Direction fromString(String direction) {
67         if (direction == null) return null;
68
69         String directionFormatted = direction.toUpperCase();
70         try {
71             return Direction.valueOf(directionFormatted);
72         } catch (Exception ex) {
73             for (Direction dir : Direction.values()) {
74                 if (dir.matches(directionFormatted)) {
75                     return dir;
76                 }
77             }
78
79             return null;
80         }
81     }
82 }
```

```
1  package uk.insrt.coursework.zuul.world;
2
3  import uk.insrt.coursework.zuul.entities.Inventory;
4
5  public class Location {
6      private Room room;
7      private Inventory inventory;
8
9      public Location() {}
10
11     public Location(Room room) {
12         this.room = room;
13     }
14
15     public Location(Inventory inventory) {
16         this.inventory = inventory;
17     }
18
19     public void setLocation(Room room) {
20         this.room = room;
21         this.inventory = null;
22     }
23
24     public void setLocation(Inventory inventory) {
25         this.room = null;
26         this.inventory = inventory;
27     }
28
29     public Room getRoom() {
30         return this.room;
31     }
32
33     public Inventory getInventory() {
34         return this.inventory;
35     }
36 }
```

```
1  package uk.insrt.coursework.zuul.world;
2
3  import java.util.HashMap;
4  import java.util.Set;
5
6  public abstract class Room {
7      private World world;
8      private String name;
9      private HashMap<Direction, Room> adjacentRooms;
10
11     public Room(World world, String name) {
12         this.world = world;
13         this.name = name;
14         this.adjacentRooms = new HashMap<>();
15     }
16
17     public World getWorld() {
18         return this.world;
19     }
20
21     public String getName() {
22         return this.name;
23     }
24
25     public void setAdjacent(Direction direction, Room room) {
26         if (room == null) System.err.println("Warning: assigned null Room to
direction " + direction + " for the Room " + this.name);
27         this.adjacentRooms.put(direction, room);
28     }
29
30     public Room getAdjacent(Direction direction) {
31         return this.adjacentRooms.get(direction);
32     }
33
34     /**
35      * Whether the player can leave in any particular direction.
36      * Should print reason if not.
37      * @param direction Direction which we are checking
38      * @return Whether the player can leave
39      */
40     public boolean canLeave(Direction direction) {
41         return true;
42     }
43
44     public Set<Direction> getDirections() {
45         return this.adjacentRooms.keySet();
46     }
47
48     public boolean hasExit(Direction direction) {
49         return this.adjacentRooms.containsKey(direction);
50     }
51
52     public void linkRooms() {
53         this.adjacentRooms.clear();
54         this.setupDirections();
55     }
56
57     public void spawnEntities() {}
58
59     public Location toLocation() {
```



```
60         return new Location(this);
61     }
62
63     public abstract String describe();
64     protected abstract void setupDirections();
65 }
```

```
1  package uk.insrt.coursework.zuul.world;
2
3  import java.util.HashMap;
4  import java.util.List;
5  import java.util.Map;
6  import java.util.stream.Collectors;
7
8  import uk.insrt.coursework.zuul.entities.Entity;
9  import uk.insrt.coursework.zuul.entities.EntityPlayer;
10 import uk.insrt.coursework.zuul.events.Event;
11 import uk.insrt.coursework.zuul.events.EventEntityEnteredRoom;
12 import uk.insrt.coursework.zuul.events.EventSystem;
13
14 public class World {
15     protected Map<String, Room> rooms = new HashMap<>();
16     protected Map<String, Entity> entities = new HashMap<>();
17     protected EntityPlayer player;
18
19     protected EventSystem eventSystem;
20
21     public World() {
22         this.eventSystem = new EventSystem();
23         this.player = new EntityPlayer(this);
24         this.entities.put("player", this.player);
25     }
26
27     public Entity getEntity(String id) {
28         return this.entities.get(id);
29     }
30
31     public EntityPlayer getPlayer() {
32         return this.player;
33     }
34
35     public EventSystem getEventSystem() {
36         return this.eventSystem;
37     }
38
39     public Room getRoom(String room) {
40         return this.rooms.get(room);
41     }
42
43     protected void addRoom(Room room) {
44         this.rooms.put(room.getName(), room);
45     }
46
47     public void spawnEntity(String id, Entity entity) {
48         this.entities.put(id, entity);
49     }
50
51     public List<Entity> getEntitiesInRoom(Room room) {
52         return this
53             .entities
54             .values()
55             .stream()
56             .filter(e -> e.getRoom() == room)
57             .collect(Collectors.toList());
58     }
59
60     protected void registerDefaultEvents() {
```

```

61         this.eventSystem.addListener(EventEntityEnteredRoom.class,
62             (EventEntityEnteredRoom event) -> {
63                 Entity entity = event.getEntity();
64                 if (entity instanceof EntityPlayer) {
65                     Room room = entity.getRoom();
66                     System.out.println(
67                         room.describe()
68                         + "\nYou may go in "
69                         + room.getDirections().size()
70                         + " directions: "
71                         + room.getDirections()
72                           .stream()
73                           .map(x -> x.toString().toLowerCase())
74                           .collect(Collectors.joining(", ")))
75                     );
76                 }
77             });
78     }
79
80     protected void linkRooms() {
81         for (Room room : this.rooms.values()) {
82             room.linkRooms();
83         }
84     }
85
86     public Entity findEntity(String name) {
87         List<Entity> entities = this.getEntitiesInRoom(this.getPlayer().getRoom(
88     ));
89         for (Entity entity : entities) {
90             String[] aliases = entity.getAliases();
91             for (String alias : aliases) {
92                 if (name.equalsIgnoreCase(alias)) {
93                     return entity;
94                 }
95             }
96         }
97         return null;
98     }
99
100    public void emit(Event event) {
101        this.eventSystem.emit(event);
102    }
103
104    /**
105     * Try to spawn the player in the first available room.
106     */
107    public void spawnPlayer() {
108        this.player.setLocation(this.rooms.values().iterator().next());
109    }
110 }

```