

Going to Town

1 new class was implemented and 1 existing classes were modified.

Vehicle class added

Vehicle class extends from Item. The purpose is this class is to move the actor from one location to the other.

Instance Variable

1. String name,
 - Name of the vehicle(It is not unique)
2. char displayChar
 - Char displayed on the map
3. Boolean portable ->False

Constructor

1. String name,
 - Name of the vehicle(It is not unique)
2. char displayChar
 - Char displayed on the map

Methods

1. public void addAction(Action action)
It adds an action to this.allowableActions
2. public void addMoveAction(GameMap map,int x,int y,Actor actor,String direction)
It checks whether the actor appears on the map or not. If actor is not in map, it moves actor to map based on the map, the x and y coordinate and prints the direction(String) of the player's movement.

Application class modified

A gameMap called ghostTown is added.

Two vehicle called car1 and car2 is added.

- Car1 is in charge of transporting player from map to the ghostTown. Car2 is in charge of transporting player from ghostTown to map.

New weapons: shotgun and sniper rifle

1 new class was implemented and 2 existing classes were changed.

Ammunition

Classes added

1. Ammunition

- Instance Variable
private int rounds;
Acts as a counter
- Constructor
Inherits name and displayChar, each round is set to 0.
- Methods
public int getRounds()
Return rounds
public void shotFired()
Decrement rounds

2. AmmunitionRifle

- Constructor:
Name and displayChar is set to "Shotgun Ammunition" and :

3. AmmunitionShotgun

- Constructor:
Name and displayChar is set to Rifle Ammunition ';

Addition of Shotgun and Sniper Rifle

Classes added

1. RangedWeapon

Abstract class that extends from WeponItem. Used to set default values and implement similar functionalities that Shotgun and SniperRifle has so as to not repeat similar code in both classes.

Constructor

public RangedWeapon(String name, char displayChar)

Calls super(name, displayChar, 10, "uses the " + name + " to "). Adds a RangedWeaponCapability.WHACK to its set of capabilities.

Methods

@Override

public int damage()

If it is shooting, default damage done is 15 points. Else, it whacks for 10 damage.

@Override

public String verb()

If it is shooting, "shoot" is appended to the verb and returned, otherwise "whack" is appended.

2. RangedWeaponCapability

Enum class to check if Weapon is currently being used to fire or as a melee weapon.

3. SniperRifle

Constructor

public SniperRifle(String name, char displayChar, int damage, String verb)

Name is set to "SniperRifle", displayChar is set to 'R', damage is set to 20 and verb is set to "wacks with SniperRifle")

4. Shotgun

Constructor

public Shotgun()

Calls super("shotgun", '|').

Classes Modified

1. Application

-> Add shotgun and sniper rifle to the map

2. Human

Methods

public weapon getWeapon()

Calls getHighestDamageWeapon(). If getHighestDamageWeapon returns null (meaning there's no weapon in inventory), getIntrinsicWeapon() is returned

private weapon getHighestDamageWeapon()

Returns the weapon with the highest damage. If there is no weapon in inventory, return null

public boolean hasRangedWeapon(Class<?> RangedWeaponType)

Checks if there is an instance of RangedWeapon in the actor's inventory.

public RangedWeapon getRangedWeapon(Class<?> RangedWeaponType)

Returns the RangedWeapon of the type specified, else if there is none, then return null.

Firing shotgun

Classes added

1. DisplayShotgunAction

Attributes

private Menu submenu

The submenu to be displayed

private Display display

The display the submenu should be on

private Actions shootDirections

Actions to be passed to the submenu

private RangedWeapon shotgun

The shotgun chosen for this action.

private Ammunition ammo;

the ammunition used to fire

Constructor

public DisplayShotgunAction(Display display, RangedWeapon shotgun, Ammunition ammo)

It is passed the display and the shotgun object that is firing, and the ammunition.

Methods

public String execute(Actor actor, GameMap map)

Puts a ShotgunFireAction for every exit of the actor in a submenu and displays that submenu. The action picked by the user, is then executed and returned.

public String menuDescription(Actor actor)

Returns a string saying actor fires the shotgun.

2. ShotgunFireAction

Attributes

private Exit direction

The direction the actor fired the shotgun in

private RangedWeapon shotgun

The shotgun being fired

private Ammunition ammo;

The ammunition used to fire

static final String NORTH = "8"

static final String NORTH_EAST = "9"

static final String EAST = "6"

static final String SOUTH_EAST = "3"

static final String SOUTH = "2"

static final String SOUTH_WEST = "1"

static final String WEST = "4"

static final String NORTH_WEST = "7"

static and final hotkeys for all possible directions to reduce literals in the code so that people who see this code in the future can easily tell which direction has what hotkey and they won't accidentally mix up the numbers if modifying the class because it's easier to keep track by direction name and not a number.

Constructor

public ShotgunFireAction(Exit e, RangedWeapon shotgun, Ammunition ammo)

Initializes direction and shotgun. Adds RangedWeaponCapability.SHOOT to its set of capabilities so that the shotgun object knows that it is being used to shoot right now and can change the damage and verb accordingly.

Methods

public String execute(Actor actor, GameMap map)

Calls the private method getRange(map) to get the list of locations within range. Then iterates through the range to see if there are actors. The actors within range have a 75% chance of getting shot.

public String menuDescription(Actor actor)

Returns a string saying fire the shotgun in what direction.

public String hotKey()

Return the exit's preferred hotKey.

private ArrayList<Location> getRange(GameMap map)

Gets the locations in range depending on the direction fired.

Firing Rifle

1. DisplayRifleAction

Attributes

private Menu submenu

The submenu to be displayed

private Display display

The display the submenu should be on

private Actions shootTargets

Actions to be passed to the submenu

private RangedWeapon rifle

The rifle chosen for this action.

Private Ammunition ammo

The ammunition of the weapon

Private int maxRange

Initialize to 100

private HashSet<Location> visitedLocations

A hashset of location

private ArrayList<Location> getAllZombieLocation

Location of all the zombie

Constructor

public DisplayRifleAction(Display display, RangedWeapon shotgun,Ammunition ammo)

It is passed the display and the rifle object that is firing, and also the ammunition.

Methods

public String execute(Actor actor, GameMap map)

Puts DisplayRifleSpecialAction(actor,rifle,ammo) for every zombie in that range

public String menuDescription(Actor actor)

Shows that actor using the rifle

public ArrayList<Location> getLocation(Actor actor, Location loc)

Gets the location of zombie

private boolean containsTarget(Location here)

Boolean that returns whether it is a target or not

private ArrayList<Location> search(ArrayList<ArrayList<Location>> layer)

Searches every layer

private ArrayList<ArrayList<Location>> getNextLayer(Actor actor, ArrayList<ArrayList<Location>> layer)

Get every layer

2. DisplayRifleSpecialAction

Attributes

private Menu submenu

The submenu to be displayed

private Display display

The display the submenu should be on

private Actions chooseAction

Actions to be passed to the submenu(Aim or Attack)

private RangedWeapon rifle

The rifle chosen for this action.

private Ammunition ammo;

The ammunition of the weapon

private Actor target;

The actor that is the target

Constructor

private RangedWeapon rifle

The rifle chosen for this action.

private Ammunition ammo;

The ammunition of the weapon

private Actor target;

The actor that is the target

Method

1. **public String execute(Actor actor, GameMap map)**

Adds RiffleAimAction and RiffleAttackAction

2. `public String menuDescription(Actor actor)`
Prints the target is chosen.

3. RifleAimAction

Instance Variables

private Actor target;

The actor getting hurt

private RangedWeapon rifle;

The weapon used

public String execute(Actor actor, GameMap map)

Calls the aim method in rifle

public String menuDescription(Actor actor)

Returns the actor aiming at the target

4. RifleAttackAction

Instance Variables

private RangedWeapon rifle

The weapon used

private Random rand = new Random();

The random generator

private Ammunition ammo;

The ammo

Constructor

`super(target);`

The target

`this.rifle=rifle;`

The weapon used

`this.ammo = ammo;`

The ammo

`rifle.addCapability(RangedWeaponCapability.SHOOT);`

public String execute(Actor actor, GameMap map,Weapon weapon)

If aim is 0, the chances are the same and the damage

If aim is 1, the chances are .9 and the damage doubled

If aim is 2, it is a insta kill.

Check ammo. If ammo is 0, then removed ammo from inventory.

5. SniperRifle

Instance Variable

Private int aiming=0

Private Actor actorTarget=null

Constructors

Name is set to SniperRifle and displayChar is }

Method

public String execute(Actor actor, GameMap map, Weapon weapon)

If there is actorTarget and the target is the same actorTarget, aiming increases.

Else, change the actorTarget to target and aiming is set to 1

public int getAim()

return aiming

public Actor getCurrentTarget()

return actorTarget

public int damage()

Overrides the previous damage.

If aiming is 0, return normal damage

If aiming is 1, return doubled damage

Else return 100.

Public void reset

Reset everything to normal(aiming=0,actorTarget=null, and remove shoot capability)

Mambo Marie

3 new classes were implemented.

VoodooPriestess

Inherits from ZombieActor because the priestess is not on Human's team (should not be assigned ZombieCapability.ALIVE) but is also not a Zombie.

ATTRIBUTES

1. **private int chantCounter**
Counter to keep track of the number of times the VoodooPriestess has chanted.
2. **private int turnsOnMap**
A counter for how many turns has it been since Mambo Marie has appeared on the map.
3. **private Behaviour[] behaviours**
Only WanderBehaviour right now. But is stored in an array so that is easy to add other behaviours if we want to in the future.

METHODS

1. **VoodooPriestess(String name)**
Constructor for a voodoo priestess. Calls super(name, '&', 200, ZombieCapability.UNDEAD). It has a parameter for the name (instead of fixing the name as 'Mambo Marie') in case we want to instantiate more Voodoo priestesses in the future. The maxHealthPoints is 200 because she should be hard to kill and the ZombieCapability is UNDEAD because she's on the same team as the Zombies.
2. **playTurn(Actions actions, Action lastAction, GameMap map, Display display)**
Increments turnsOnMap by one. If she has spent 30 turns on the map, she will be removed from the map and turnsOnMap will be reset to 0. If turnsOnMap is divisible by 10 (every 10 turns she spends on the map), a new ChantAction is created. Otherwise, we will loop through the other behaviours she has to get an action.

ChantAction

Inherits from Action.

ATTRIBUTES

1. **private int chantCounter**
The number of times the actor has invoked ChantAction. This is for naming the zombies.
2. **private Random rand**
Random generator to generate random locations.

METHODS

1. **ChantAction(chantCounter)**
Constructor for ChantAction the nth time the actor has chanted is passed as parameter.
2. **@Override execute(Actor actor, GameMap map)**
Creates five new Zombie objects at random locations in the map. They would have names "Zombie Minion" + which chant it came from and what number zombie it was in that particular chant (e.g. Zombie Minion 3.2 indicates that this zombie was the

second zombie to rise from the dead from the actor's third chant). This naming convention allows the zombies to have unique names, the player to know how many times Mambo Marie has chanted, and allows zombies that have risen from the chant to be named more dynamically than picking out names from a fixed collection of names. Returns the menu description..

3. **@Override**

menuDescription(Actor actor)

Returns a string saying actor chants and 5 new zombies have risen from the dead.

ZombieWorld

See design rationale for this class under section 'Ending the game'.

Ending the game

2 new classes were implemented and 2 existing classes were changed.

Application

Change world to be a ZombieWorld object instead of World from the engine package. Pass world as a parameter to player to give the option to quit.

Player

ZombieWorld is now an instance variable and is passed through the constructor.

QuitAction(zombieWorld) has been added to the list of actions in playTurn. To quit, it was either this or we had to put QuitAction in an overridden processActorTurn() in ZombieWorld. But we decided that if we put it in processActorTurn() we had to downcast to check that QuitAction was only added for the player's list of actions and also the rest of the method was the same as the super method so there would have been a lot of repeated code. And even though having an instance variable to store the ZombieWorld in player would give player access to its other methods, there is no way for the user to call these methods so nothing can be changed in ZombieWorld. Decidedly, this is the best way to implement quit.

QuitAction

Inherits from Action.

ATTRIBUTES

1. **private ZombieWorld zombieWorld**

The world player wants to quit from.

METHODS

1. **QuitAction(zombieWorld)**

Constructor for QuitAction. zombieWorld instance variable is initialised.

2. **@Override**

execute(Actor actor, GameMap map)

Calls zombieWorld.quit() to change its status so that it can stop running. Returns the menu description..

3. **@Override**

menuDescription(Actor actor)

Returns a string "Quit".

4. **@Override**

hotkey()

Returns a character "Q" for the hotkey to quit.

ZombieWorld

Inherits from World.

PRIVATE ENUM CLASS

GameStatus

Tells if the game has been won, lost, the player has quit, or the game is running. Declared as a private class within ZombieWorld because keeping track of the outcome of the gameplay should be encapsulated within this class itself.

ATTRIBUTES

1. **private GameStatus currentStatus**

To keep track of the currentStatus of the game.

2. **private VoodooPriestess mamboMarie**

Mambo Marie is initialized in the world itself so that she can easily be removed and put on map while still processing her turn.

3. **private Random rand()**

Random generator for chances of mamboMarie appearing that turn.

METHODS

1. **ZombieWorld(Display display)**

Constructor. It passes display to super constructor.

2. **@Override**

run()

Almost the same as the super method, except that for each turn, Mambo Marie has a 5% chance of appearing on the map the player is currently on. She will appear at the coordinates (0,0) unless there is something blocking there, then we will go through the locations in the top edge, and try to add her. We implemented the appearing of Mambo Marie this way, so that she can appear easily on any map in the world and she would appear on the map where the player is currently on.

3. **quit()**

Sets the currentStatus to GameStatus.QUIT. This method was implemented so that currentStatus wouldn't have to be declared as public and so other classes won't be able to change it. The only time another class can change the status, is to quit.

4. **@Override**

stillRunning()

Checks if game should still be running and if it should, then return true. If not, then change the status if it needs to be done and then return false. To check if the game has been won or lost, we iterate through actorLocations and check how many zombies and humans are left. If there are no more humans, the game is lost. If there are no more zombies and Mambo Marie has been defeated, the game is won.

5. **@Override**

endGameMessage()

Prints a string depending on the outcome of the gameplay. It will throw an error if the game has ended and this method has been called, but the status is not GameStatus.LOST, GameStatus.WON or GameStatus.QUIT.

ASSIGNMENT 2 MODIFICATIONS

Zombie Attack

1. Create a new behavior class call `ZombieAttackBehavior`
 - Returns a new `ZombieAttackAction` instead of an `AttackAction`
2. Create a new `AttackAction` called `ZombieAttackAction` class
 - Since `ZombieAttackAction` is only for zombie, the if-else statement that was used to check the class for actor and target is removed from the original `AttackAction`'s `execute` method. Therefore `ZombieAttackAction` only check if the weapon is a bite or punched and whether the target is dead or not.
3. Modification of zombie class
 - zombie class's behavior list replace `AttackBehaviour` with `ZombieAttackBehaviour`
4. Create a new `AttackAction` called `HumanAttackAction`.
 - Since this guarantees that the target is a zombie, it will check whether the zombie loses any legs or hands and will add the limbs to the map.
5. Create a new behavior class call `HumanAttackBehaviour`
 - Returns a new `HumanAttackAction`
6. Modify zombie class by overriding the `getAllowableAction` by replacing `HumanAttackAction` instead of `AttackAction`.
 - This is because `getAllowableAction` is all the action that is allowed to act on the current actor(zombie) by other actor(human).
7. The old version of `AttackAction` replaces the current `AttackAction` so that if a new class that has no special features was added, they will be using `AttackAction`, with the exception of the addition of human corpse(from assignment 2 corpse) in the method `isDead()`.
8. A new method called `isDead` is added to check whether the target is Dead or not.
 - If the target is human and the target is dead, it will turn into a human corpse and will turn into a zombie.
9. The `execute` method was being overload multiple times. But doing this, **we reduce repeated code and it is more accessible**

i) `public String execute(Actor actor, GameMap map, Weapon weapon, Double chances)`

Shows that you can now set the percentage of success.

ii) `public String execute(Actor actor, GameMap map, Weapon weapon, int damage)`

Shows that you can now choose the weapon and set the damage you want the zombie to take.

iii) `public String execute(Actor actor, GameMap map, Weapon weapon)`

Shows that you can set the weapon

All these modifications are made to make the code more readable and extendable. The system now does not need to check if the actor and target is a zombie or not. Since the part where the target, actor and weapon that will be the one changing depending on with attack action it has, and the part where the target is checked whether it is conscious or not, `isDead` reduces the repeated code in all `AttackAction` classes. It makes the code more extendable and readable.

Farmer Behaviours

`HarvestBehaviour`, `FertilizeBehaviour` and `SowBehaviour` are combined into one behaviour called `FarmingBehaviour`. This is because there is some overlap in functionality such as when harvest and fertilizing, the Farmer looks at the location where he is currently standing and Farmer checks exits when harvesting and also sowing crops. So in order to **reduce the dependencies and repeated code**, I've decided to combine them into one behaviour which then calls the different farming actions.