ASSIGNMENT 4

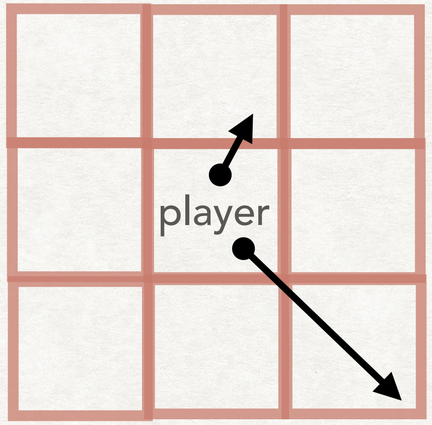
TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Player Movement

The player can move into any adjacent square as a movement action.

The don't need to move into the centre of the new square. Crossing the boundary between two squares is sufficient to occupy the new square.



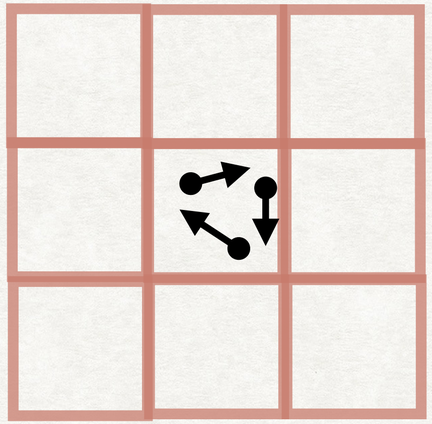
Both of these movements would be considered equivalent as far as the AI is considered. In both cases the player has moved into a new square. Their position in the new square isn't important.

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Player Movement

The player can move around inside a square and not trigger an update of the AI (not use up their turn). Only crossing the boundary of a square will cause the AI to respond.

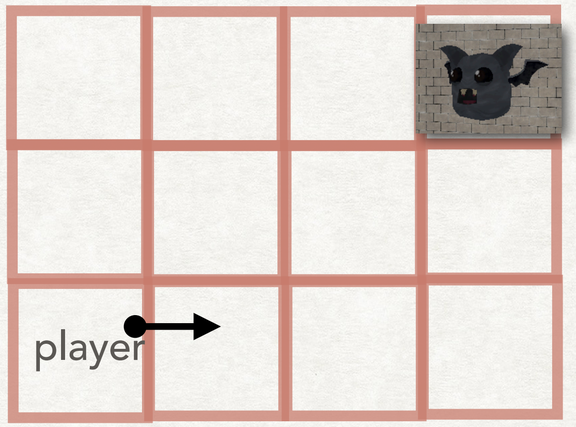


TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Taking Turns

Turns alternate between the player and the AI system. When it is the AI's turn, it can update all of the mobs before giving the player their turn. Each mob gets one update per turn.



Player's Turn

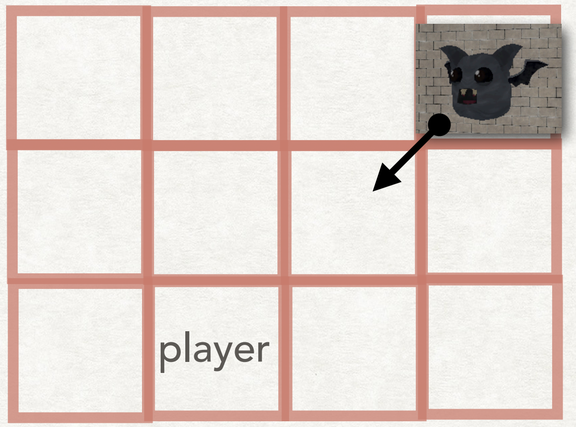
Turn 1

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Taking Turns

Turns alternate between the player and the AI system. When it is the AI's turn, it can update all of the mobs before giving the player their turn. Each mob gets one update per turn.



Mob's Turn

Turn 2

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Taking Turns

Turns alternate between the player and the AI system. When it is the AI's turn, it can update all of the mobs before giving the player their turn. Each mob gets one update per turn.

Turn 3

Player's Turn

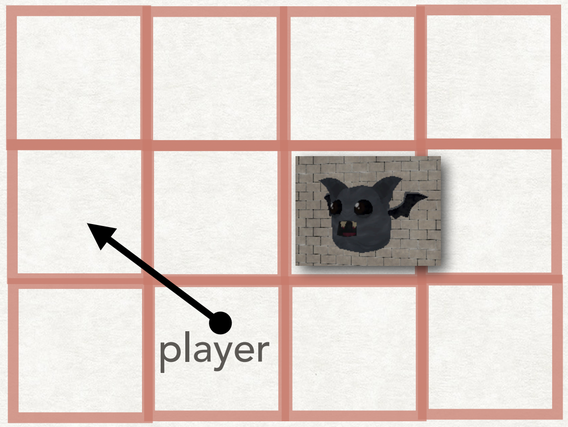
The player and the mob are now adjacent so they can either fight or continue to move. The mob will always choose to fight when it is adjacent to the player.

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Taking Turns

Turns alternate between the player and the AI system. When it is the AI's turn, it can update all of the mobs before giving the player their turn. Each mob gets one update per turn.



Turn 3 - option 1

Player's Turn

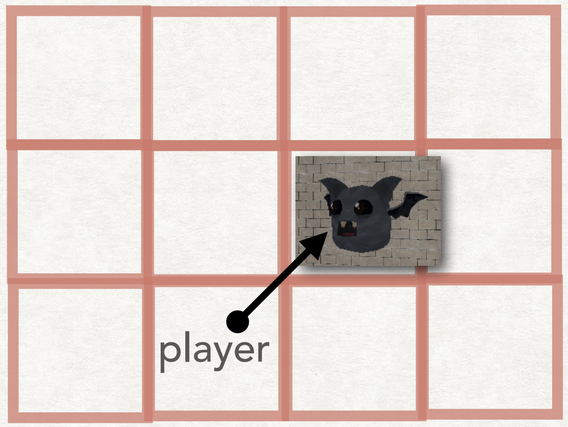
Moving to an empty square is a move operation.

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Taking Turns

Turns alternate between the player and the AI system. When it is the AI's turn, it can update all of the mobs before giving the player their turn. Each mob gets one update per turn.



Turn 3 - option 2

Player's Turn

If the player tries to move to a square occupied buy the mob it is an attack on the mob.

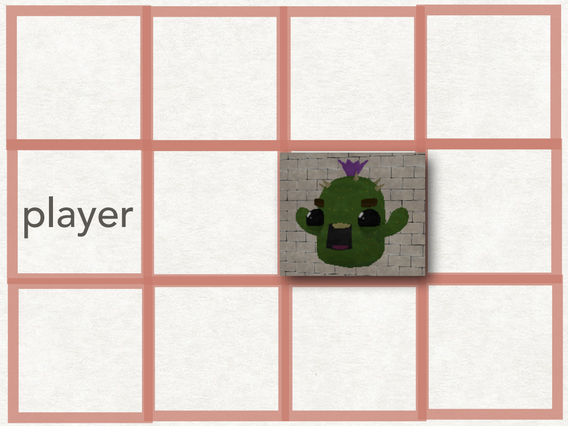
TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Combat

The player and a mob must be in adjacent squares in order for them to fight.

If they are not adjacent then they can only move.



Move Only

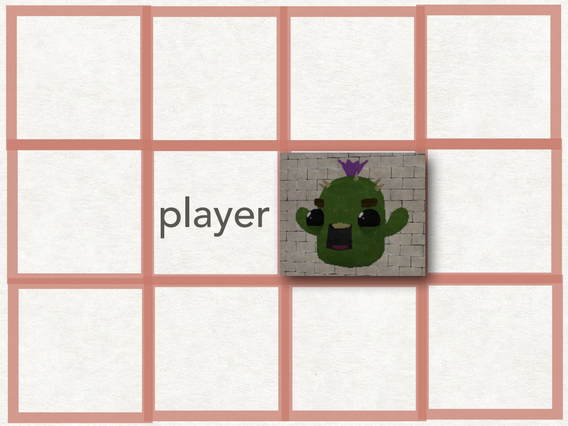
Although the cactus can never move. Other mobs can move.

TURN BASED ACTIONS

The player and the AI take turns. A turn is defined as either moving into a new square or attacking the opponent.

Combat

When they are adjacent then they can either move or fight.



Fight or Move

STATE MACHINES CONTROL THE AI

There are three AI strategies used to control the mobs in the game. Each strategy makes the AI behave in different ways.

The strategies are plant, random search, and responsive. Each of these uses a different state machine to control the AI.

More than one mob can use the same state machine at a time.

PLANT AI

The strategy is to wait for the player to stand beside the mob and then attack.

The plant cannot move.

Since the AI and player take alternate turns, the plant always attack first because the player must move to an adjacent square to attack.

PLANT AI STATE MACHINE

End State
-set mob to inactive
-stop drawing mob

yes

Did the player successfully hit the mob?

Wait for the player to move or attack.

no

Is the player adjacent to the mob?

yes

Attack the player.

no

Wait until the player moves to a new square.

Initial State
-set the mob to active
-draw mob is TRUE

PLANT AI STATE MACHINE

End State
-set mob to inactive
-stop drawing mob

yes

Did the player successfully hit the mob?

no

Wait for the player to move or attack.

yes

Attack the player.

Is the player adjacent to the mob?

no

Wait until the player moves to a new square.

FIGHT THE PLAYER AS LONG AS THEY ARE ADJACENT

WAIT FOR THE PLAYER TO BE ADJACENT

Initial State
-set the mob to active
-draw mob is TRUE

RANDOM SEARCH AI

The strategy is to pick a destination point on the map and move towards it. If the player becomes visible then move towards the player and attack when adjacent.

This will require a strategy to move to a new location and a strategy to follow the player when they are sighted.

Use player visibility to determine if the mob sees the player. If the player sees the mob then the mob sees the player and will start to follow them.

RANDOM SEARCH AI STATE MACHINE

End State
-set mob to inactive
-draw mob is FALSE

yes

Move one square
towards the destination.

no

Are the player and
the mob in adjacent
squares?

no

Did the player
hit the mob?

yes

Is the player
visible?

yes

no

If the mob reached
the destination
then pick a new
destination.

Move one square
towards the player.

Attack the
player

Wait for the player
to move one square.

Wait for the player
to move or attack.

Initial State
-set the mob to active
-draw mob is TRUE
-pick a destination to move towards

RANDOM SEARCH AI STATE MACHINE

End State
-set mob to inactive
-draw mob is FALSE

Move one square towards the destination.

no

If the mob reached the destination then pick a new destination.

Wait for the player to move one square.

Is the player visible?

yes

Are the player and the mob in adjacent squares?

yes

Attack the player

no

Move one square towards the player.

Wait for the player to move or attack.

Did the player hit the mob?

no

yes

Initial State
-set the mob to active
-draw mob is TRUE
-pick a destination to move towards

SEARCHING

FOLLOW AND FIGHT THE PLAYER

RESPONSIVE AI

For this strategy the AI waits in a room until the player enters the room. Once inside the room the mob moves towards and fights the player.

The mob should be moving around the room as was implemented in assignment 3.

If the mob is near the door then the player will be able to see it from the hallway. If the player does not enter the room then the mob will not follow or attack the player.

RESPONSIVE AI STATE MACHINE

Initial State
-set the mob to active
-draw mob is TRUE

Is the player in the room?

no

Wait for the player to move one square.

yes

Are the player and the mob in adjacent squares?

yes

Attack the player

no

Move one square towards the player.

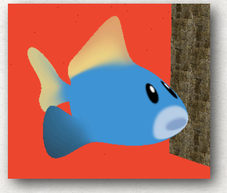
Wait for the player to move or attack.

Did the player hit the mob?

no

yes

End State
-set mob to inactive
-draw mob is FALSE



RESPONSIVE AI STATE MACHINE

Wait for the player
to move one square.

no

Is the player
in the room?

yes

WAITING FOR THE PLAYER TO ENTER THE ROOM

Initial State
-set the mob to active
-draw mob is TRUE

Are the player and
the mob in adjacent
squares?

yes

Attack the
player

no

Move one square
towards the player.

Wait for the player
to move or attack.

Did the player
hit the mob?

no

yes

End State
-set mob to inactive
-draw mob is FALSE

AFTER PLAYER ENTERS THE ROOM

COMMON AI ACTIONS

There are several common behaviours in the different AI strategies that can be reused.

All of the strategies use the actions:

- wait for the player to move to a new square
- attack the player
- test if the player and mob are in adjacent squares
- deactivate the mob if the player hits it

The random search and responsive AI strategies also use the following behaviours:

- change behaviour when the player is seen (either entering the room or when the player sees the mob)
- follow the player by moving towards them (one step per turn)