CE810 - Game Design 2

Lab - Game Design Hack

Joseph Walton-Rivers & Piers Williams

Wednesday, 16 May 2018

University of Essex

2018-05-25

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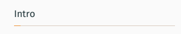
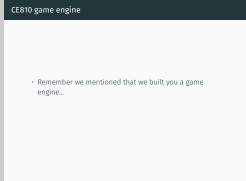
Intro


Intro

CE810 game engine

- Remember we mentioned that we built you a game engine…



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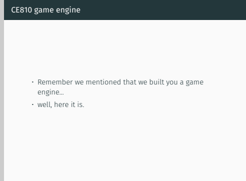

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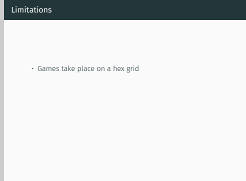
- Games take place on a hex grid



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- In fairness, it is the UI and AI that do not support it

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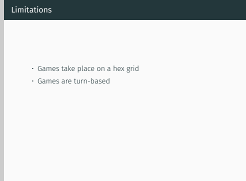

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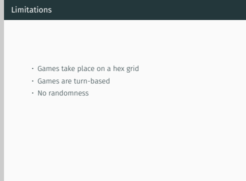

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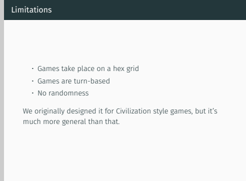

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Comparison

A number of you have **encountered** the GVGAI Framework.

GVGAI Framework

Our System

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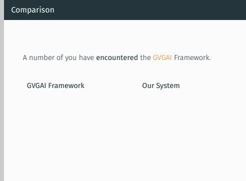
└Intro

└Comparison



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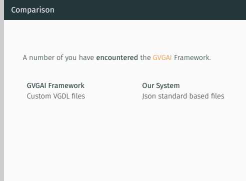

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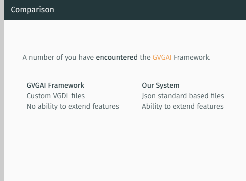
└Intro
└Comparison



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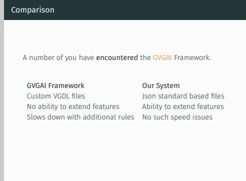

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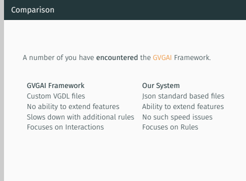

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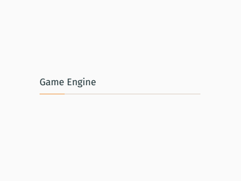
Game Engine



Game Engine

Key Parts

- A game has **Entity Types**, **Resources**, and **Terrain**

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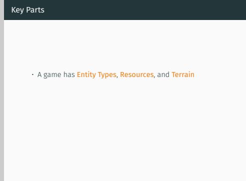
└─Game Engine
  └─Key Parts



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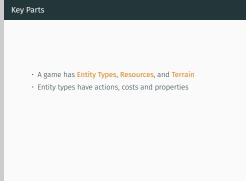

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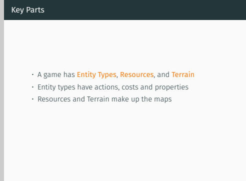

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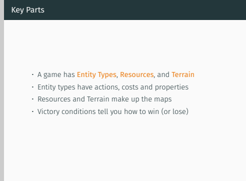

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Entity Types

- Used to **define** an Entity

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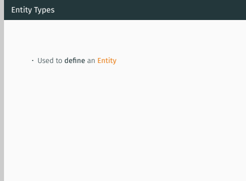
└Game Engine
└Entity Types



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└─Game Engine

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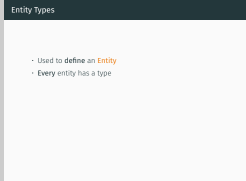

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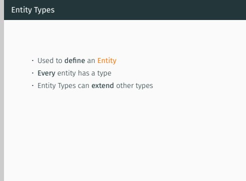

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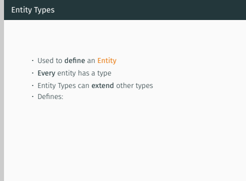

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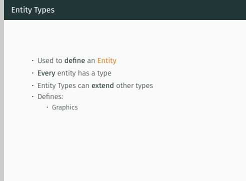

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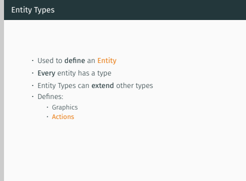

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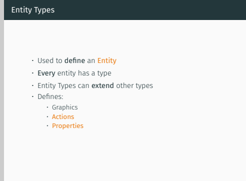
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Example: EntityType

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"properties": {
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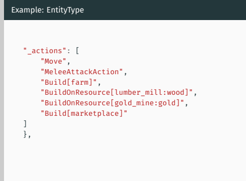

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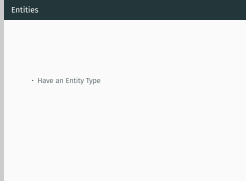

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└─Game Engine
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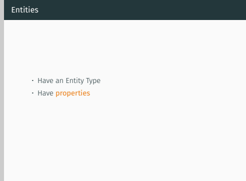

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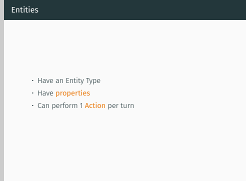
Entities

- Have an Entity Type
- Have **properties**
- Can perform 1 **Action** per turn



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What an Entity can do

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└─Game Engine
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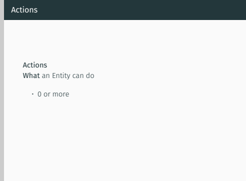

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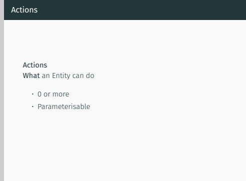

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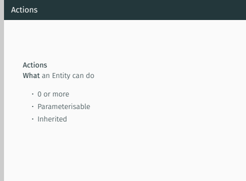

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Order

An order is **generated** when an Action is used on a **particular** location

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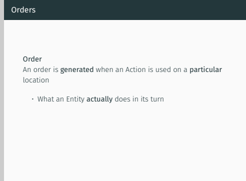

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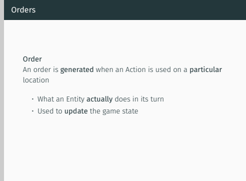
- Used to **update** the game state



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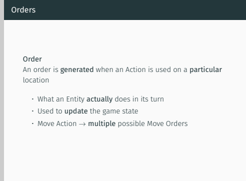

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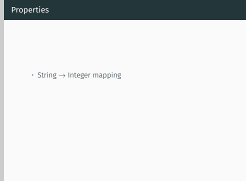

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- For example movement or attacking
- One from the Entity Type, another from the Entity itself that overrides it. EntityType properties can’t be changed - only overwritten by lower level

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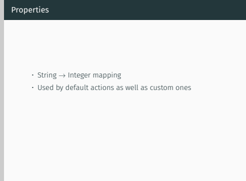

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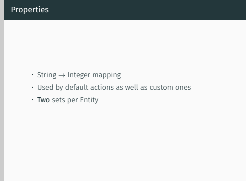

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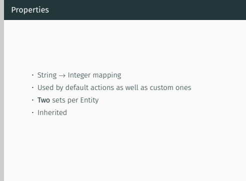

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Terrain

Terrain defines the ground in the games

id The name of this terrain type

image The graphics path for drawing

requiredTags Mapping of String → Integer.

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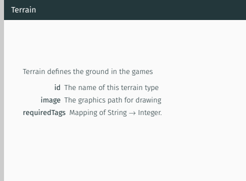
└Game Engine

└Terrain



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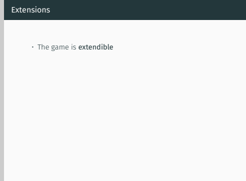
- Keys are the tags needed as an entity property with “‘ter-”
- Values are how much the entity property needs to be to travel here

Extensions

- The game is **extendible**



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- Built in items are detected the same
- First class citizens in the engine

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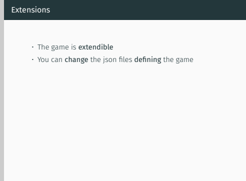

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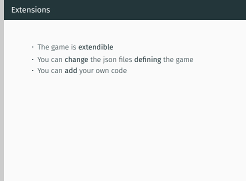
Extensions

- The game is **extendible**
- You can **change** the json files **defining** the game
- You can **add** your own code



Extensions

- The game is **extendible**
- You can **change** the json files **defining** the game
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- Built in items are detected the same
- First class citizens in the engine

Extensions

- The game is **extendible**
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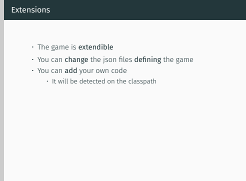
  - It will be detected on the classpath



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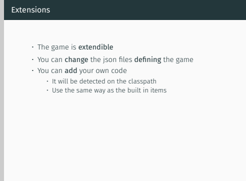

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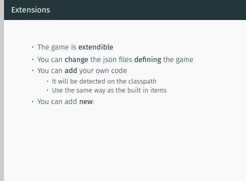

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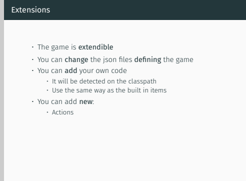

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- You can add **new**:
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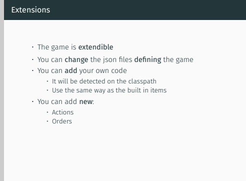
    - Orders



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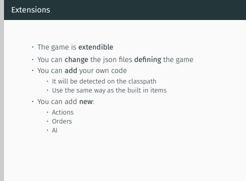
  - Orders
  - AI



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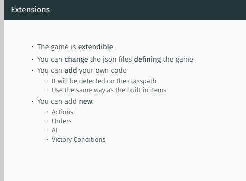

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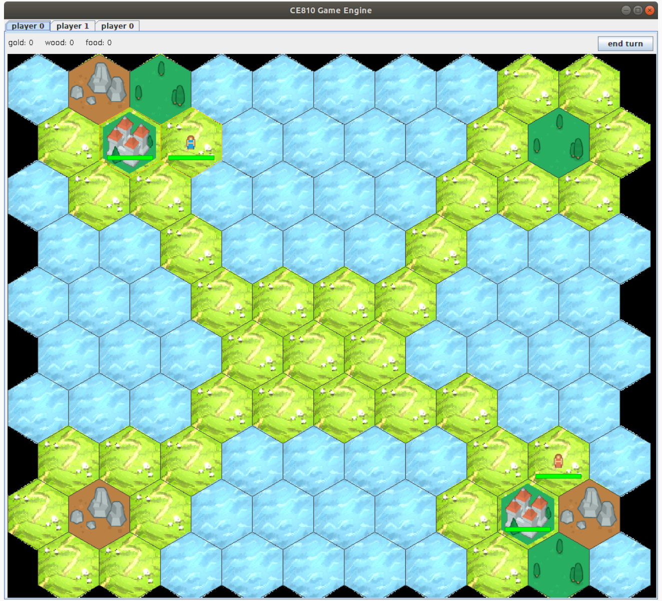
Examples

Examples

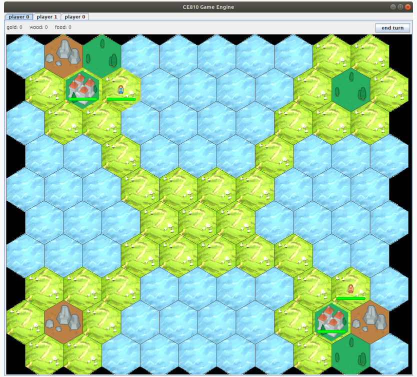
Medieval TBS



gold: 0 wood: 0 food: 0

Medieval TBS

Medieval TBS



gold: 0 wood: 0 food: 0

- Fairly conventional

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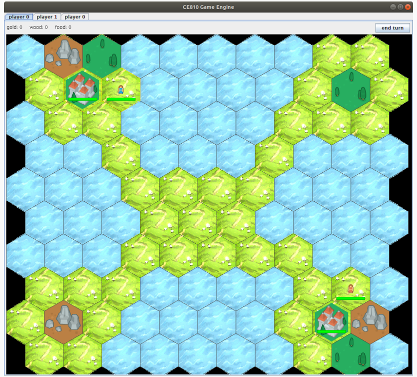
CE810 GD2
└Examples
└Medieval TBS

Medieval TBS

- Fairly conventional

Medieval TBS



- Fairly conventional
- Build on resources for turnly income

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CE810 GD2
└Examples
└Medieval TBS

Medieval TBS

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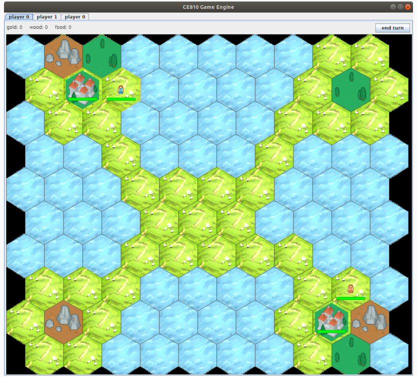
- Build on resources for turnly income

Medieval TBS

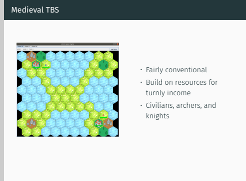


CE810 Game Engine

player 0 | player 1 | player 0

gold: 0 wood: 0 food: 0

- Fairly conventional
- Build on resources for turnly income
- Civilians, archers, and knights



Medieval TBS

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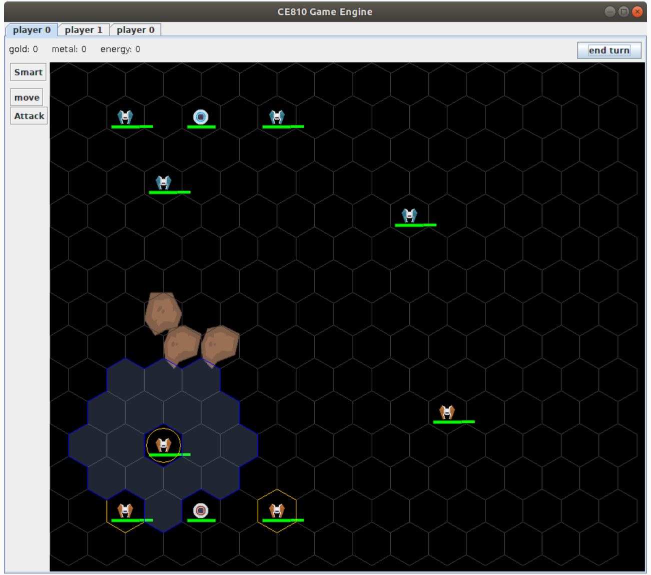
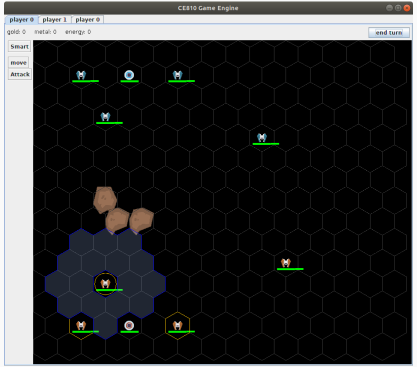
Transmission



gold: 0 metal: 0 energy: 0

Transmission

Transmission



- Global Game Jam 2018 Entry

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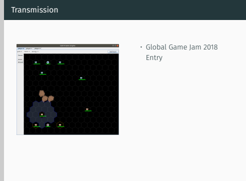
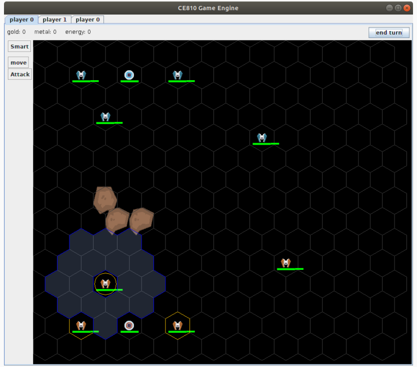
CE810 GD2
└Examples
└Transmission


Transmission

- Global Game Jam 2018 Entry

Transmission



- Global Game Jam 2018 Entry
- Space based TBS

2018-05-25

CE810 GD2
└Examples
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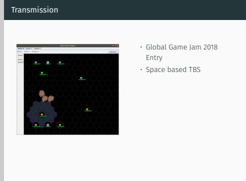
Transmission

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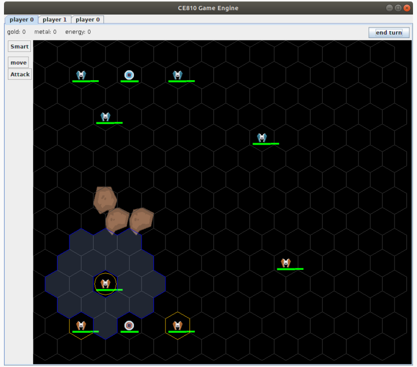
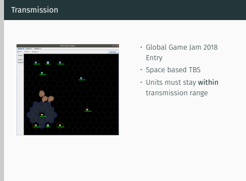


- Global Game Jam 2018 Entry
- Space based TBS
- Units must stay **within** transmission range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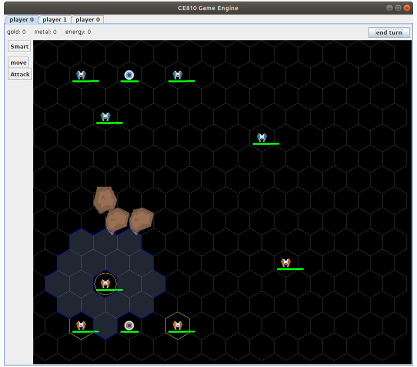
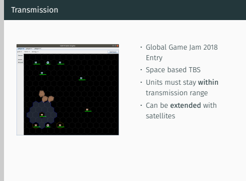


- Global Game Jam 2018 Entry
- Space based TBS
- Units must stay **within** transmission range
- Can be **extended** with satellites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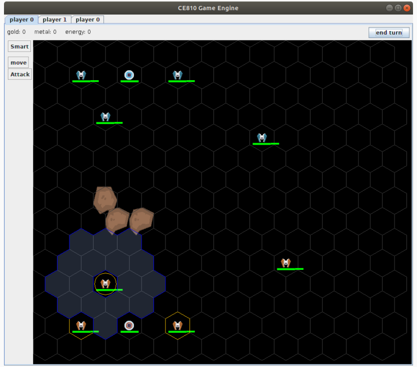

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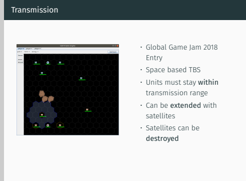
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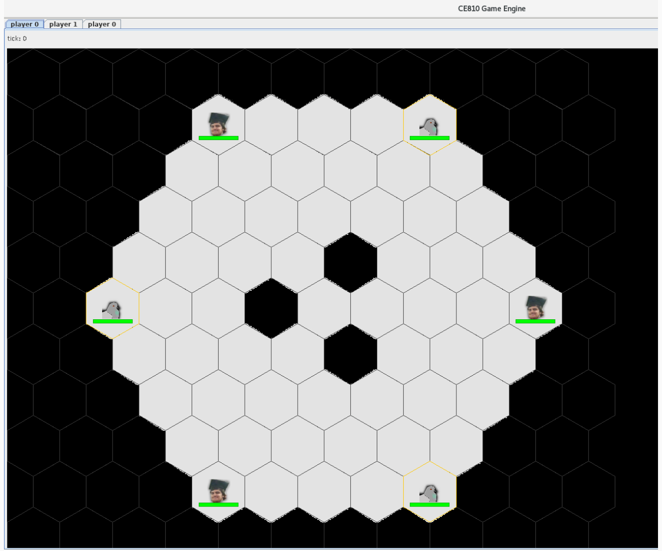
Hexxagon



tick: 0

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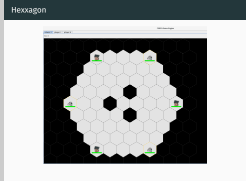
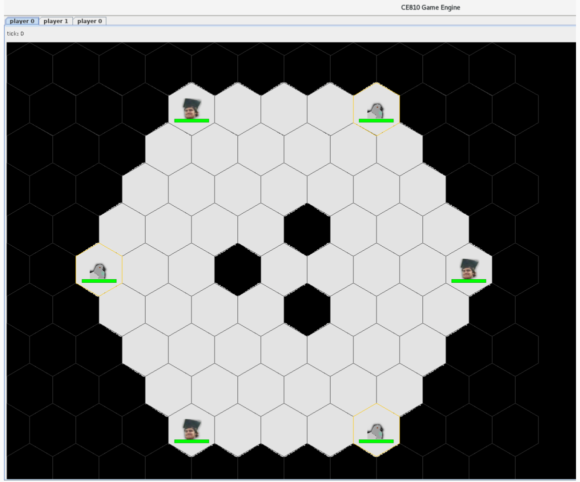
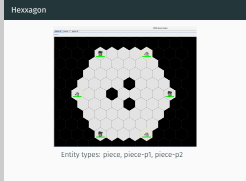
CE810 GD2
└Examples
└Hexxagon



Hexxagon



Entity types: piece, piece-p1, piece-p2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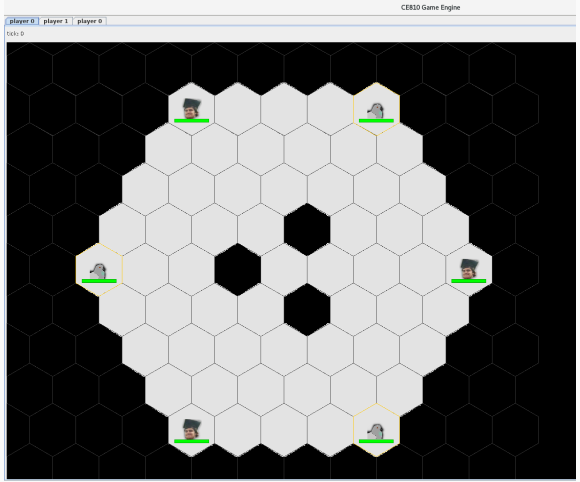

Terrain types: board

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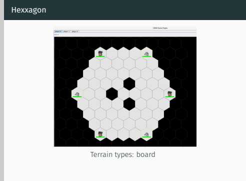
CE810 GD2
└Examples

└Hexxagon


Hexxagon

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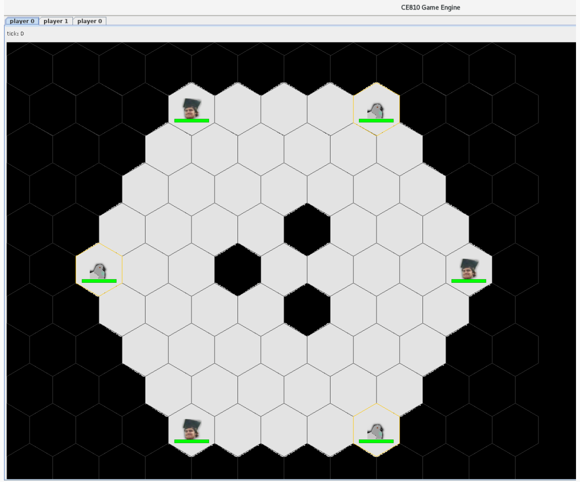
Hexxagon



CE810 Game Engine

player 0
player 1
player 0

ticks: 0

Actions: jump and clone

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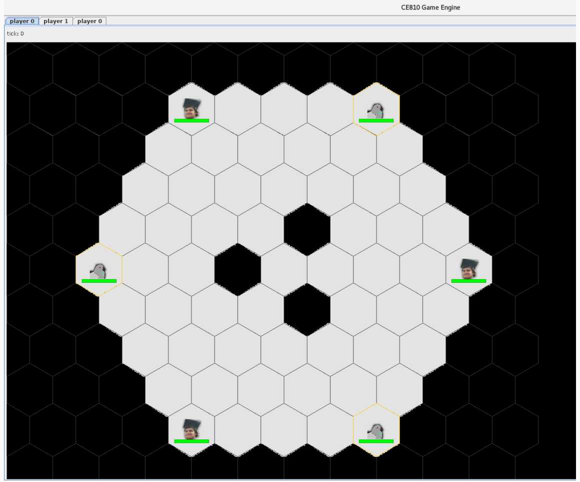
CE810 GD2
└Examples
└Hexxagon

Hexxagon

Actions: jump and clone

Hexxagon



Resources: ticks (used to permit moving only one piece)

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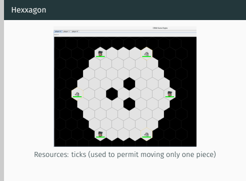
CE810 GD2
└Examples
└Hexxagon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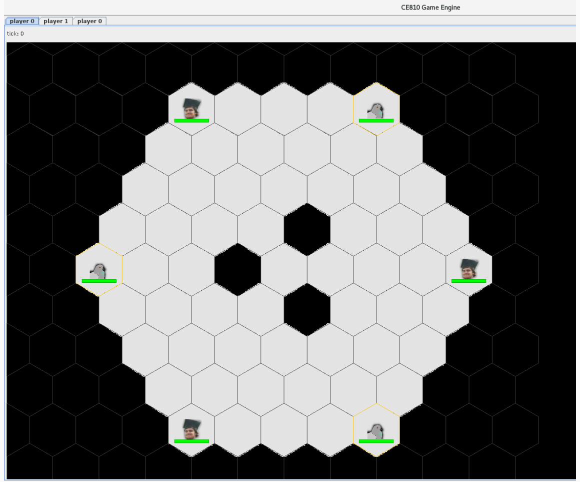

Victory conditions: LastManStanding, MostPiecesLock

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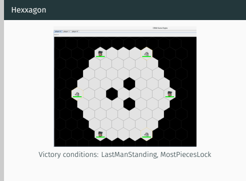
CE810 GD2
└Examples
└Hexxagon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Victory conditions: LastManStanding, MostPiecesLock

Hexxagon Entity Definition

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  "name": "piece", // it's called 'piece'
  "properties": {
    "ter-playzone": 1, // it can 'walk' on
↪  playzone tiles
    "health": 1 // it has 1 health (things
↪  with no health die)
  },
  "_actions":[
    "Jump[tick]", // Jump Action (defined in
↪  Java)
    "Clone[tick]" // Clone action (defined in
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```

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CE810 GD2
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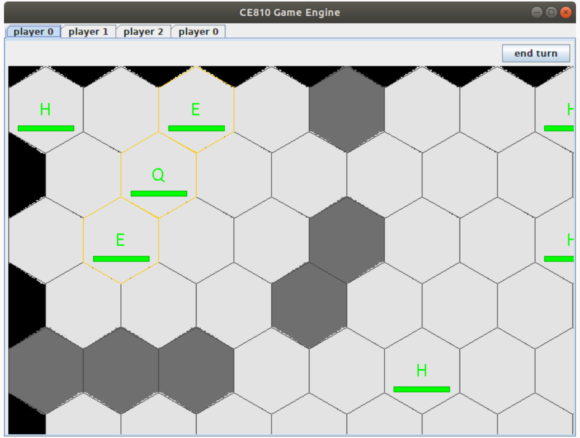
Aliens Versus Predators



2018-05-25

CE810 GD2
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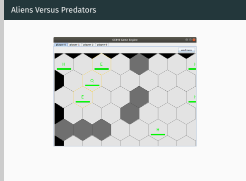
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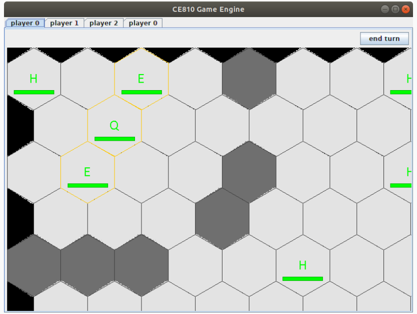
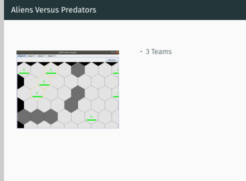


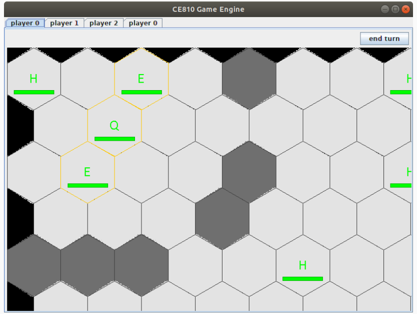
- 3 Teams


Aliens Versus Predators

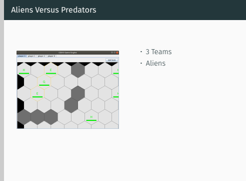
- 3 Teams

- Needed custom actions to avoid using resources.
- Uses properties instead
- Humans and Predators quite mundane

Aliens Versus Predators



- 3 Teams
- Aliens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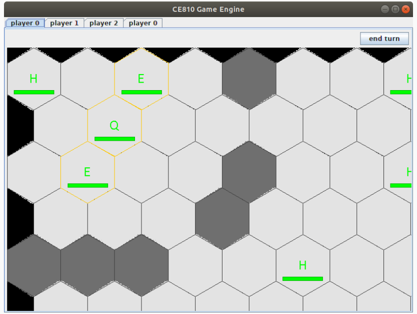
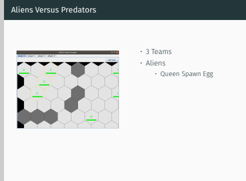


- 3 Teams
- Aliens
  - Queen Spawn Egg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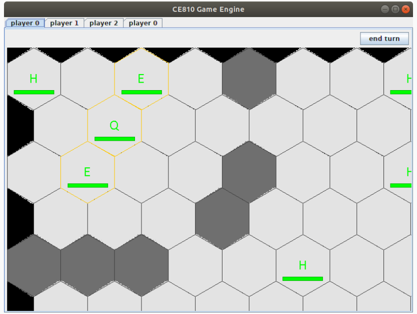
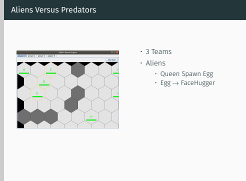


- 3 Teams
- Aliens
  - Queen Spawn Egg
  - Egg → FaceHugger


Aliens Versus Predators

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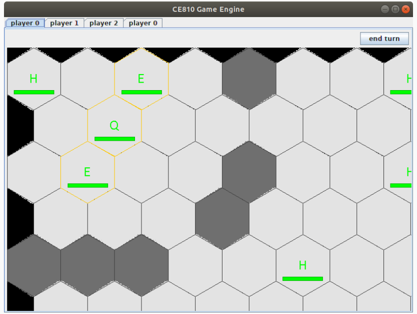
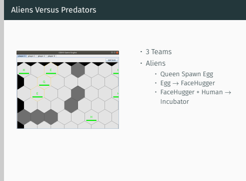
Aliens Versus Predators



- 3 Teams
- Aliens
  - Queen Spawn Egg
  - Egg → FaceHugger
  - FaceHugger + Human → Incubator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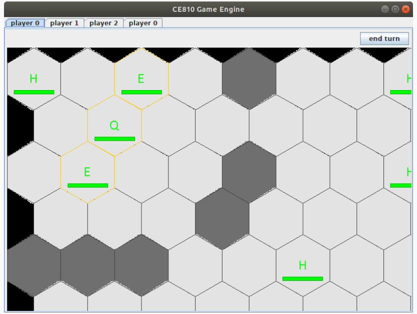

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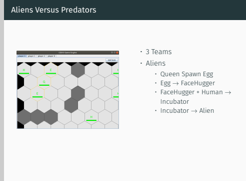
Aliens Versus Predators

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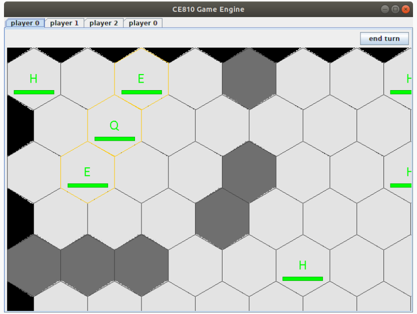
Aliens Versus Predators



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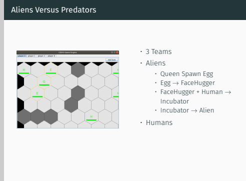
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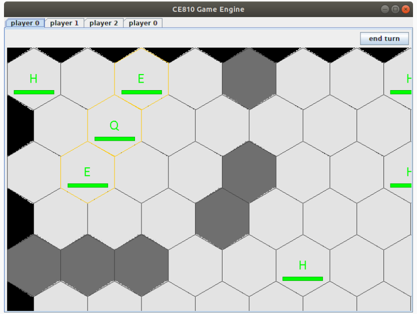

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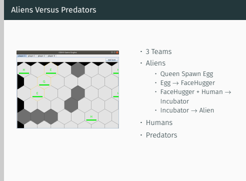
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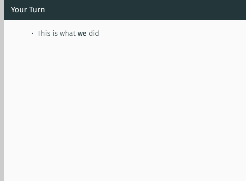

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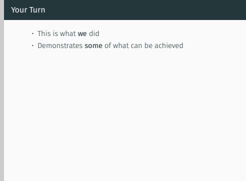

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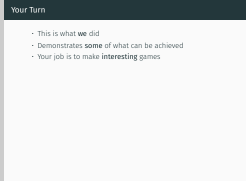
└─Examples
└─Your Turn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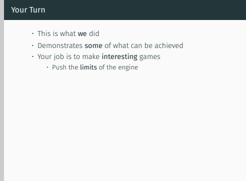

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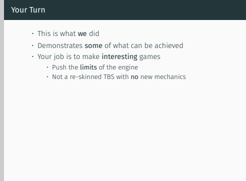

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2018-05-25

CE810 GD2
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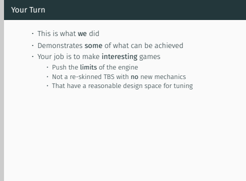

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CE810 GD2
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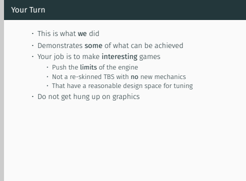

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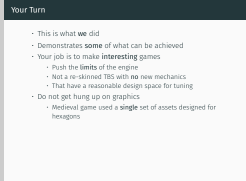

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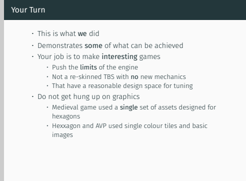

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CE810 GD2
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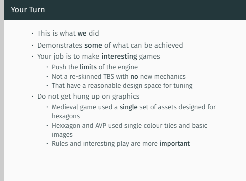

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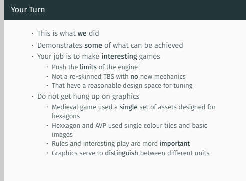

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Design Patterns

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└Design Patterns

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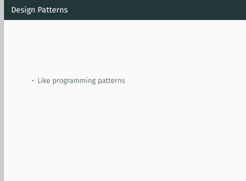
- Like programming patterns



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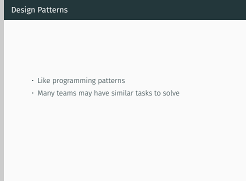

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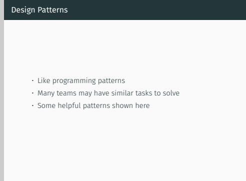

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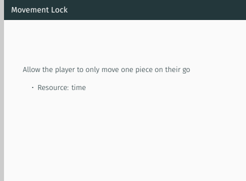
Movement Lock

Allow the player to only move one piece on their go

- Resource: time



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└─Design Patterns
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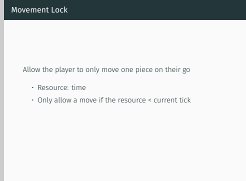

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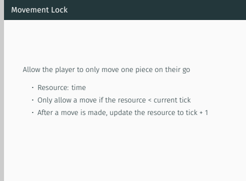

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CE810 GD2

└─Design Patterns

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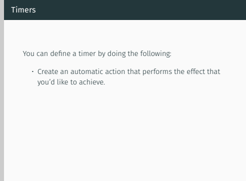

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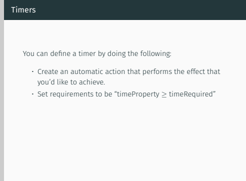

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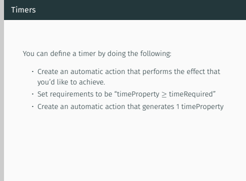

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CE810 GD2
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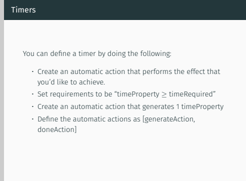

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