

# Final Project AI

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AI used: Goal Oriented Action Planning

## Summary

The Battle is a 3D battle strategy game comprising of different battle units, economy factors like food and wood, and space management. Main objective is to defeat the opponent AI by destroying its Town Towers. Players spawn battle units on one of the three lanes which move in a straight path, attacking anything that's on their way.

### Battle Units:

#### 1. Combat Unit

These are the main battle unit, which move faster than other units but are in-effective against Town Towers.

- Health: 100
- AttackTo (Siege): 20
- AttackTo (Combat): 10
- AttackTo (Tower): 5
- Speed: 3
- Cost: Food – 5, Wood – 2

#### 2. Siege Unit

These units are used for siege operation, mainly destroying Town Towers, they can also fight combat units, but they are ineffective against them.

- Health: 100
- AttackTo (Siege): 10
- AttackTo (Combat): 5
- AttackTo (Tower): 20
- Speed: 2
- Cost: Food – 1, Wood – 4;
- Tower Health: 200

### Worker Units:

#### 1. Forager

These are spawned to get food from shrubs to the inventory. They walk at a constant speed and takes 3 seconds to get food and 1 second to deliver.

- Cost: Food – 2
- Carry Capacity – 3
- Speed: 1

## **2. Wood Cutter**

These are spawned to get wood from trees to the inventory. They walk at a constant speed and takes 4 seconds to get wood and 1 second to deliver.

- Cost: Food – 2
- Speed: 1
- Carry Capacity – 4

### **Space Management:**

Town has a max capacity of 10 people including all the battle and worker units therefore, player will need to kill one of the units occasionally to make space for the other one which maybe more needed in the situation.

End Game State:

Player wins if more than one of the opponent's towers gets destroyed. After the lane tower breaks, that lane will kill any battle unit in it.

### **Logic:**

AI uses the cost manipulation for everything, from spawning battle units, worker units or kill units. Cost is adjusted based on the current threat and type of it on the lane, total battle units and worker units present, if space is present, and the amount of food and wood present in the inventory. AI is managed by only one Manager script which have all the actions inside it for e.g., spawn combat unit, spawn forager, kill wood cutter etc. These are feeded into GOAP planner with a desired state of defending a lane, and the list of actions are returned. Manager has only idle and perform states.