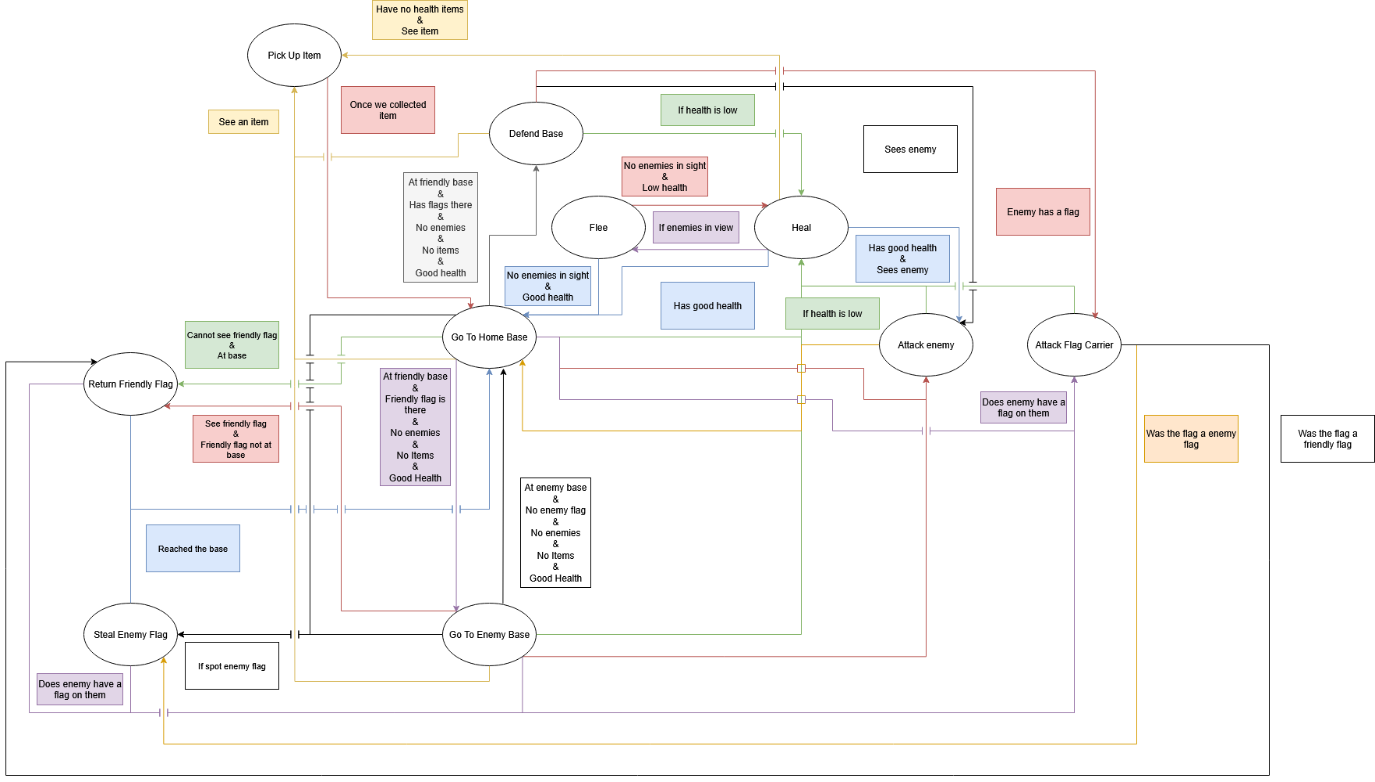
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# AI Design:

## Flow chart:

[Link to diagram](https://viewer.diagrams.net/?tags=%7B%7D&lightbox=1&highlight=0000ff&edit=_blank&layers=1&nav=1&title=StateMachineAIModule.drawio&dark=auto#Uhttps%3A%2F%2Fdrive.google.com%2Fuc%3Fid%3D1t53fZWIuec5HHsRFXfMy_FqkZ0WhrsyU%26export%3Ddownload)



## State table:

All possible states:

* Go to friendly base.
* Go to enemy base.
* Return friendly flag.
* Steal enemy flag.
* Attack enemy.
* Attack flag carrier.
* Heal.
* Flee.
* Pickup item
* Defend base.

|  |  |  |  |
| --- | --- | --- | --- |
| Current State | Input | Next State | Output |
| Go to friendly base | Spots friendly flag not in base | Return friendly flag | Go and return friendly flag to base |
| Go to friendly base | See enemy flag | Steal enemy flag | Go and get the enemy flag and take it to base |
| Go to friendly base | Low health | Heal | Try and heal self |
| Go to friendly base | See enemy | Attack enemy | Go to enemy and attack them |
| Go to friendly base | See enemy with flag | Attack flag carrier | Go to flag carrier and attack them |
| Go to friendly base | See both flags at base | Defend base | Sit at base and defends |
| Go to friendly base | See item | Pick up item | Go and collect the item |
| Go to friendly base | At base | Go to enemy base | Start heading to the enemy base |
| Go to enemy base | Spots friendly flag not in base | Return friendly flag | Go and return friendly flag to base |
| Go to enemy base | See enemy flag | Steal enemy flag | Go and get the enemy flag and take it to base |
| Go to enemy base | Low health | Heal | Try and heal self |
| Go to enemy base | See enemy | Attack enemy | Go to enemy and attack them |
| Go to enemy base | See enemy with flag | Attack flag carrier | Go to flag carrier and attack them |
| Go to enemy base | See item | Pick up item | Go and collect the item |
| Go to enemy base | At enemy base | Go to friendly base | Start heading to the friendly base |
| Attack enemy | Target enemy is dead | Go to friendly base | Go back to base |
| Attack enemy | We have low heal | Heal | Try and heal self |
| Attack flag carrier | Was the dropped flag the friendly flag | Return friendly flag | Return the flag to base |
| Attack flag carrier | Was the dropped flag the enemy flag | Steal enemy flag | Return the flag to base |
| Return friendly flag | At friendly base | Go to friendly base | Returned the flag |
| Return friendly flag | Enemy has flag | Attack flag carrier | Attacking enemy with flag |
| Steal enemy flag | At friendly base | Go to friendly base | Stole the flag |
| Steal enemy flag | Enemy has flag | Attack flag carrier | Attacking enemy with flag |
| Heal | Sees enemy and has no health item | Flee | Run away |
| Heal | Sees enemy and has health item | Attack enemy | Attack the enemy |
| Heal | Healed | Go to friendly base | Go back to what we are doing |
| Heal | Has no health item | Pickup item | Go look for items |
| Flee | See no enemies and has low health | Heal | Go back to healing self |
| Flee | See no enemies and has good health | Go to friendly base | Go back to what we were doing |
| Pickup item | Collected item | Go to friendly base | Go back to what we were doing |
| Defend base | Low health | Heal | Try and heal self |
| Defend base | See enemy | Attack enemy | Go to enemy and attack them |
| Defend base | See enemy with flag | Attack flag carrier | Go to flag carrier and attack them |
| Defend base | See item | Pick up item | Go and collect the item |

# Testing:

# Reflection:

## NOTES:

When attacking enemies, the AI should priorities the closes one to them and or the weakest one.

AI will go and try and collect an item they already have.

AI can get stuck looping in some states. (forgot which ones).

Need to store the previous state at times, so for example healing, we can go back to attacking enemy base or defending.

Attack flag carrier is obsolete. Not only because attack enemy acts the same, but you cannot know if a specific enemy has a flag.

Need a can transition function that return true, if possible, to transition so AI doesn’t get stuck swapping between states and doubling checking logic.