

Prey-Predator Systems

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Prey-Predator System: Fox and Rabbits

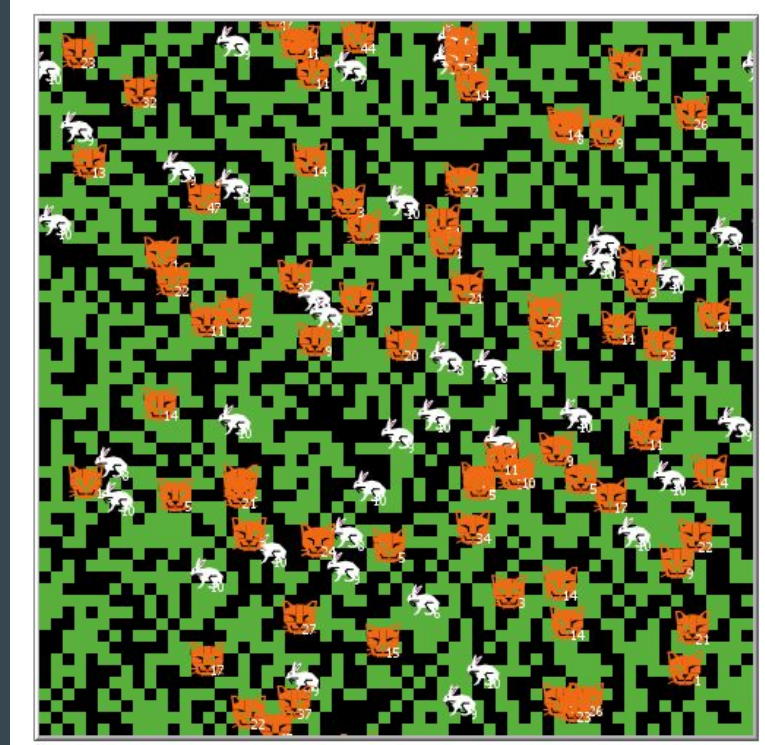


: Fox



: Rabbit

The environment in which the agents move are within a 30 by 30 grid in which the green patches symbolizes grass and the black patches are marked as eaten grass. The rabbit has to consume the grass for the survival of their species. After 100 ticks of when the grass was consumed, it will regrow and be marked as a green patch.



Prey and Predator

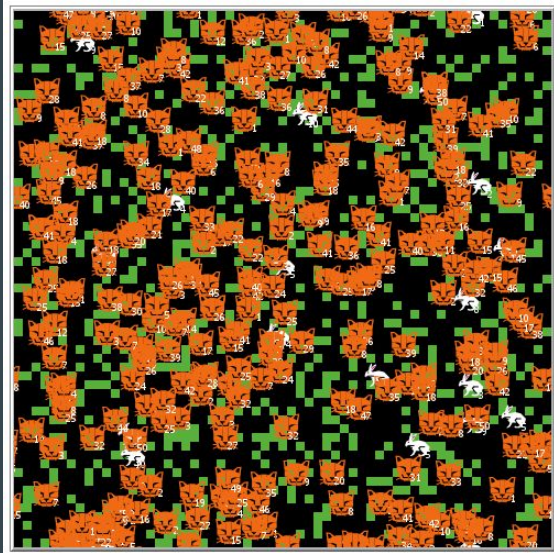
Rabbits initially has population of 50, and their hunger bar last for 10 ticks, if it reaches 0, then they die. If they land on a green patch, they eat the “grass” and refill their hunger bar. Rabbits have a reproduction chance of $1/30$.

Foxes initially has population of 50, and their hunger bar last for 50 ticks, if it reaches 0, then they die. Foxes can only eat rabbits on the same patch as them. Foxes have a reproduction chance of $1/30$.

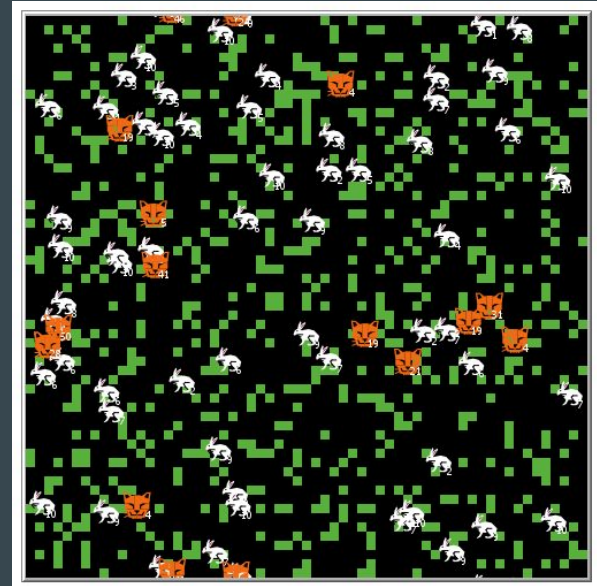
Both Rabbits and Foxes have a turn radius of 50 and their forwards speed is also 50. Both Agents follow a randomized movement and eat when they land on a patch with their corresponding food

Behavior of the Model

The Fox's population initially grows which causes majority of the rabbit population to decrease. When the rabbits reach a significantly smaller population, the foxes start dying due to the difficulty of finding rabbits. After the foxes start dying, the rabbit population slowly grows allowing the foxes to grow as well since they can find more rabbits to eat. This cycle repeats with each stage alternating.

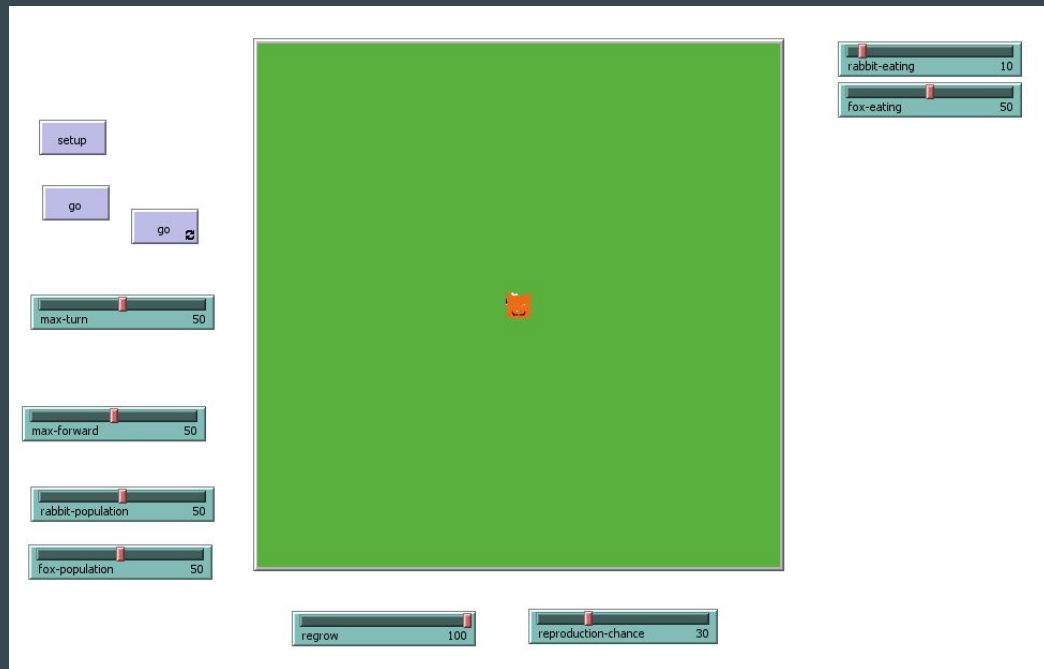


Growing Fox Population

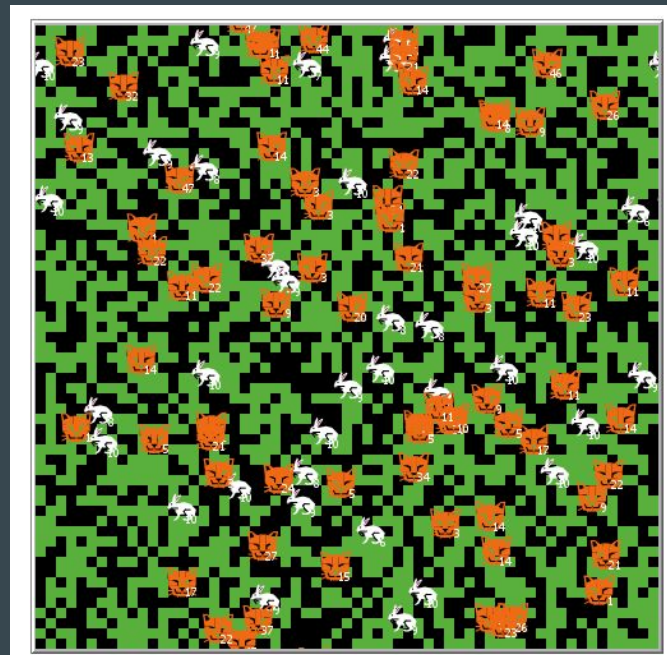


Growing Rabbit Population

Other images



Initial Setup



Sample End at 500 ticks