<Project Name> Design Proposal

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Design Rationale

For the Ecosystem program, I use seven classes and two interfaces to implement the requirement. Those classes are EcosystemUI, Ecosystem, EcosystemIO, Animals, HighPosition, MiddlePosition and LowPosition, and these two interfaces are breeding and eating. The EcosystemUI calss has an instance of the Ecosystem class. The Ecosystem class maintains the array of ecosystem initialized by the input file and provides functionality to change the order of the values. The Ecosystem class utilizes the EcosystemIO class to read the file and initialize an array of "animals". The EcosystemUI class is the view/controller of the project, EcosystemIO class processes the input file, and Animals, HighPosition, MiddlePosition and the LowPosition classes are the model.
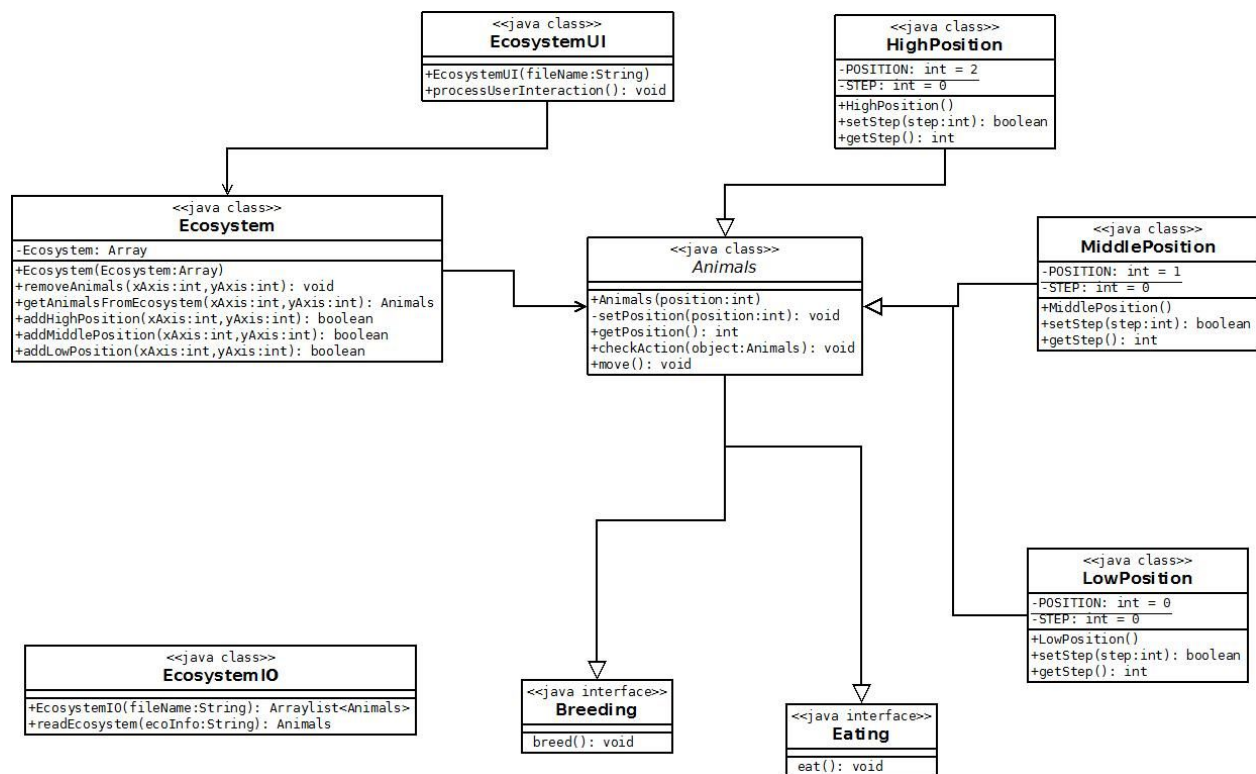

Figure 1: Class Diagram for <Ecosystem>

The EcosystemUI class starts the program. the filename of the EcosystemIO is provided as a command line argument and is passed to the constructor. the EcosystemUI will construct the Ecosystem object, and the Ecosystem will construct the Animals object based on the input file and handle exceptions thrown during the construction. the processUserInteraction() method handles the console I/O for the program and calls appropriate methods in the Ecosystem class and either HighPosition, MiddlePosition, and LowPosition class to complete the ecosystem.

the Ecosystem class construct an array with the size given in the input file. Then constructs several animals objects to fill out the ecosystem array. These animals objects has their position and steps they

have gone. In the ecosystem, these animals move for several steps based on the user input, and while they encounters another animal, they will performs appropriate actions based on their differences of their position. For instance, if an animal in a higher position encounters another animal in a lower position, it calls the checkAction method to calculate the difference between two animals and performs an action of "eat", which will lead to a change of the ecosystem.

This design limits three types of animals that they both have the methods specific to the behavior and the properties of the animals. For that reason, these animal objects can perform appropriate actions easily based on the type of animal they encountered.

Document Revision History

Date	Author	Change Description
Sep 20	Jialang Li	● Added class diagram
Sep 23	Jialang Li	Implemented document