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Software Development 1

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Milestone for Flower Garden Project

This paper will serve to illustrate my final project that I have created over the course of this semester. I will explain concepts including what the system does, how users interact with it, the physical requirements needed, and the ultimate significance it holds.

For project 2, I have decided to create a program that emulates the growth of a garden. I was motivated to create this project because I am interested in objects and inheritance, which I learned a little about in high school. After hearing more in class about this subject I wanted to pursue a program focused around it. This project creates a garden of flowers and bushes and modifies their rate of growth using a random generation of values.

First, I made an interface for items to be planted in a garden. In the interface I modified the size of the plant to reflect plant growth, as well as to take into account instances of frost and rain. Then, I wrote a class Flower that implements PlantInterface. I created instance variables for location, height, width, and growth rate. A constructor takes parameters that indicate the x and y coordinates (as integers) of the base of the flower. I set the initial height of the flower to be 30.0, the width to be 8.0, and the initial growth rate to be .5. For each day the plant grows, the height increases by the growth rate. Rain increases the growth rate by .1, while frost kills the plant and resets the growth rate, height, and width to 0.0. I created a test driver to test my Flower class and Interface, but I want to somehow make it user interactive in the future. I then made a

FlowerGarden class that represents a collection of plants. It contains an ArrayList of type PlantInterface which holds flowers. I also created instance variables of length and width. When the grow, rain, frost, or draw message is sent to FlowerGarden, the garden sends a message to all the flowers in the garden. I also added a method plantNewPlants that is called to add several new plants to the garden. The constructor creates the number of flowers whose x and y coordinates are within the garden. I generated the x and y locations for the plants using a random number in the confines of the garden. I then made another driver to compile my program. I also created bushes, which grow in width. I had to create an abstract class to implement PlantInterface for shared code between the Bush and Flower class, and extended the classes to Plant instead of PlantInterface. I also used a superclass constructor. I made a BushGarden like the FlowerGarden, and created another abstract class called Garden to share the code between the gardens. I then made a garden that was half bush and half flowers, but I have not added it to output to my driver. I want to implement this aspect, as well as make my code more interactive with my user as opposed to being static outputs. My UML diagrams are displayed below:

| Plant |
|---|
| height: double width: double growth: double xCoord: int yCoord: int |
| Plant(int, int, double, double) grow(int) rain(days) frost(): void draw(): void toString(): String |

| Garden |
|---|
| xCoord: int yCoord: int width: int height: int plantNum: int |
| Garden(int, int, int, int, int) grow(int) rain(int): void frost(): void draw(): void toString(): String plantNewPlants(int): void |

The physical requirements this project requires includes a computer and a text editor (I used TextWrangler) that allows for Java.

Ultimately, this is what I have accomplished in my project so far. I still need to incorporate more user interactivity somehow and expand the functions of my code. I am hoping to improve it over the course of the next few weeks before the demo.