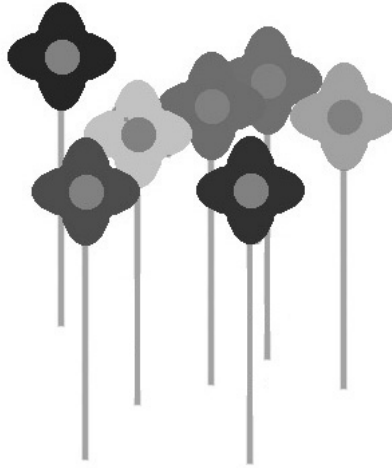


## CS 134 Programming Exercise 3: Popping up All Over

**Objective:** To gain experience defining a class and its methods.

**The Scenario.** It's almost spring and the flowers will be coming up through the snow at any moment. This program will help you prepare for that day. The program will draw and grow flowers like the following:



The canvas should initially start empty. When you click on the canvas, a flower should start growing at that point. Initially it will be just a sprout, but as you drag the mouse around, it should grow. When it reaches its full height, the stem should stop growing and petals should appear. The color for the petals should be chosen randomly. The flower won't grown any more, but if you click on the petals after it has bloomed, the flower will change color. When you are happy with the flower's color, you can grow another one by clicking somewhere else in the window. When the mouse moves out of and then back into the window, the scene should reset itself to be empty.

Your program will be divided into two classes: a window controller called **Spring** and a **Flower** class. We will actually provide a complete **Spring** class in the starter folder. You should not modify our **Spring** class in any way. Instead, you have to implement the **Flower** class so that it works with our **Spring**. In particular, the **Flower** constructor should expect three parameters: the **Location** where the **Flower**'s stem should be planted, a **double** specifying the maximum height of the **Flower**, and the canvas. The **Flower** class should define the following methods used by the controller to implement the functionality described above:

1. `public void changeColor():` sets the color of the flower petals to a random color.
2. `public boolean flowerContains(Location point):` returns true if the petals or center of the flower contains the point.
3. `public void grow():` make the flower grow a bit if it has not already reached its full size and sprouted petals.

The flower will only grow when the mouse moves, so **Flower** should not extend **ActiveObject**.

Feel free to add other graphic items to the **Flower** class to make the flowers look more attractive.