Unit 8 FRQ Name: _____

The ExperimentalFarm class represents crops grown on an experimental farm. An experimental farm is a rectangular tract of land that is divided into a grid of equal-sized plots. Each plot in the grid contains one type of crop. The crop yield of each plot is measured in bushels per acre.

A farm plot is represented by the Plot class. A partial definition of the Plot class is shown below.

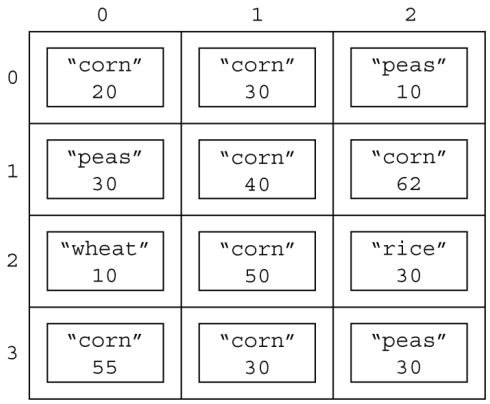
```
public class Plot
{
   private String cropType;
   private int cropYield;

   public Plot(String crop, int yield)
   {
   /* implementation not shown */
   }

   public String getCropType()
   {
      return cropType;
   }

   public int getCropYield()
   {
      return cropYield;
   }
}
```

The grid of equal-sized plots is represented by a two-dimensional array of Plot objects named farmPlots, declared in the ExperimentalFarm class. A partial definition of the ExperimentalFarm class is shown below.

```
public class ExperimentalFarm
{
   private Plot[][] farmPlots;

   public ExperimentalFarm(Plot[][] p)
   {
   /* implementation not shown */
   }

/** Returns the plot with the highest yield for a given crop type, as described in part (a).
*/
   public Plot getHighestYield(String c)
   {
   /* to be implemented in part (a) */
   }

/** Returns true if all plots in a given column in the two-dimensional array farmPlots
* contain the same type of crop, or false otherwise, as described in part (b).
*/
   public boolean sameCrop(int col)
   {
   /* to be implemented in part (b) */
   }
}
```

(continued on back)

(a) Write the getHighestYield method, which returns the Plot object with the highest yield among the plots in farmPlots with the crop type specified by the parameter c. If more than one plot has the highest yield, any of these plots may be returned. If no plot exists containing the specified type of crop, the method returns null.



Assume that the ExperimentalFarm object f has been created such that its farmPlots array contains the following cropType and cropYield values.

The following are some examples of the behavior of the getHighestYield method.

Method Call	Return Value
f.getHighestYield("corn")	farmPlots[1][3]
f.getHighestYield("peas")	farmPlots[1][0] or farmPlots[3][2]
f.getHighestYield("bananas")	null

Write the getHighestYield method below.

```
/** Returns the plot with the highest yield for a given crop type, as described in part (a). */

public Plot getHighestYield(String c)
```

(b) Write the sameCrop method, which returns true if all the plots in a given column of farmPlots grow the same crop and returns false otherwise.

Assume that the ExperimentalFarm object f has been created such that its farmPlots array contains the cropType and cropYield values shown to the right.

	0	1	2
0	"corn" 20	"corn" 30	"peas" 10
1	"peas" 30	"corn" 40	"corn" 62
2	"wheat" 10	"corn" 50	"rice" 30
3	"corn" 55	"corn" 30	"peas" 30

The following are two examples of the behavior of sameCrop:

- The method call f.sameCrop(0) returns false because the values of cropType for the elements of column 0 ("corn", "peas", "wheat", and "corn") are not all the same.
- The method call f.sameCrop(1) returns true because the values of cropType for all elements of column 1 are the same ("corn").

Write the sameCrop method below.

```
/** Returns true if all plots in a given column in the two-dimensional array farmPlots
* contain the same type of crop, or false otherwise, as described in part (b). */

public boolean sameCrop(int col)
```