**CS390**

**Fundamental Programming Practices**

## Practice Problem

The code in your midterm\_practice\_0318.ooproblem package produces the following output when the main method in the Driver class is run:

/\ /\ \/ ||

Each of the figures displayed is represented by a separate class. For example, the figure

/\

is created by the class HatMaker. The main method in the Driver class creates an array of instances of these figure classes and then calls the constructor of Driver, which loops through the array and prints to the console each figure. However, to accomplish this, the code in the constructor tests the type of each figure class, and then downcasts the current object in the array to the correct type, and then calls the object's getFigure method in order to print the figure.

In this problem generalize these figure makers by creating an abstract class Figure with one abstract method getFigure(), and make all the figure maker classes be subclasses of Figure. In the constructor of your new version of Driver, you must use polymorphism to output figures instead of checking individual types. To make the instructions on this point clear, some of the new version of the Driver class has already been coded for you.  
  
One other step for this exercise is to create on additional class, FaceMaker, whose getFigure method produces a figure like this:

:)

After you have finished coding your main method for the Driver class, the output after running the main method should look like this

/\ /\ \/ || :)

Here is a list of the things you need to do for this problem:

1. Create an abstract class Figure and have each of the other classes (other than Driver) extend Figure and place Figure and these modified classes in package prob1\_new.
2. Modify the constructor of Driver so that polymorphism is used instead of checking individual types.
3. Create an additional class FaceMaker that produces this figure: :)
4. Recall that final output from the main method in Driver looks like this:

/\ /\ \/ || :)