Programming Assignment 6

Getting Started

This assignment is designed as a practice on the basics of class definitions. It requires knowledge of the material in Sections 4.1 and 4.2. Review class handouts and posted practice problems.

Programming Project

CreateAPizza: Define a class, representing a pizza **worth 17 points**

A pizza take-out shop has contracted you to create an application for managing the orders it receives from customers. In this assignment, you will work on the first step in this application: creating a class type representing a pizza.

Define class **Pizza** as follows. Each object of this class should include the following private instance variables **(1 point)** :

1. *size* - a character (type *char*), representing the size of the pizza: M - for medium, S - for small, and L - for large;
2. *toppings* - an array of strings (type *String []*), specifying the set of pizza toppings (excluding the cheese),
3. *status* - an integer, representing the status of the ordered pizza, which can be either 0 - not started, 1- in progress, or 2 - ready;

All instance variables should be declared private, and no other instance variables should be included in this class.

Define the following methods:

1. **(2 points) instance method setSize()**, which should be passed a parameter of type char, representing the size of the pizza. The method should check that the parameter is equal to 'S', 'M' or 'L', and if it is, assign the calling object's size instance variable to that parameter. Otherwise, the method should report that the size value is not recognized and set the instance variable *size* to 'M'. The method should return true, if the value of the size parameter was appropriate, and false otherwise.
2. **(2 points) instance method setStatus()**, which should be passed an integer parameter, representing the status value. The method should check that the parameter is between 0 and 2, and if it is, assign the calling object's *status* field to that parameter. Otherwise, the method should report that the size value is not recognized and set the instance variable *status* to 0. The method should return true, if the parameter defined a valid status, and false otherwise,
3. **(1 point) instance method setToppings()**. This method should be passed a parameter of type *String []* (i.e. String array), representing the requested pizza toppings. The method should assign the calling object's instance variable *toppings* to the parameter that was passed. This method should return no value, i.e. be declared as *void*.
4. **(1 points) Accessor methods** for each instance variable.

5. **(1 point) instance method numToppings()**. This method should check if the instance variable *toppings* is not null, and in that case return the length of the array stored in the *toppings* instance variable. If the *toppings* array is null, the method should return 0.
6. **(2 points) instance method calcPrice**. This method should calculate and return the price of the pizza (as a value of type double) according to the following rules: the price equals the base price plus additional price per each topping. The base price for small, medium and large pizza, respectively, is \$8.00, \$9.00 and \$10.00. Each topping costs \$1.00 for small pizza, \$1.50 for medium, and \$2.00 for large.

Further, define class **TestPizza** in the same project folder with class **Pizza**. **TestPizza** should have a single main method which will be used for testing the functionality of the Pizza class. The main method should **(5 points)**

1. Create a new object of class Pizza.
2. Prompt the user to enter and read a character indicating pizza size.
3. Ask the user about the number of toppings and create an array to store the specified number of toppings.
4. Run a loop to read the topping names and store them in the array.
5. Call the appropriate methods of the Pizza class to set instance varaibles of the created pizza object to the values entered by the user.
6. Print a message about the pizza, including the price information, using the appropriate instance methods of the Pizza class. The price should be formatted to display 2 digits after the period.

The following two sample interactions illustrate how the TestPizza class should run (user input is shown in **boldface**:

```
Please enter the size of pizza (S, M or L): L
How many toppings would you like to add to the pizza?  3
Please enter topping number 1 mushrooms
Please enter topping number 2 peppers
Please enter topping number 3 chicken
************************************************
Created a pizza of size L and 3 toppings:
1.  mushrooms
2.  peppers
3.  chicken
This pizza costs $16.00
Pizza readiness status is 0
************************************************
```

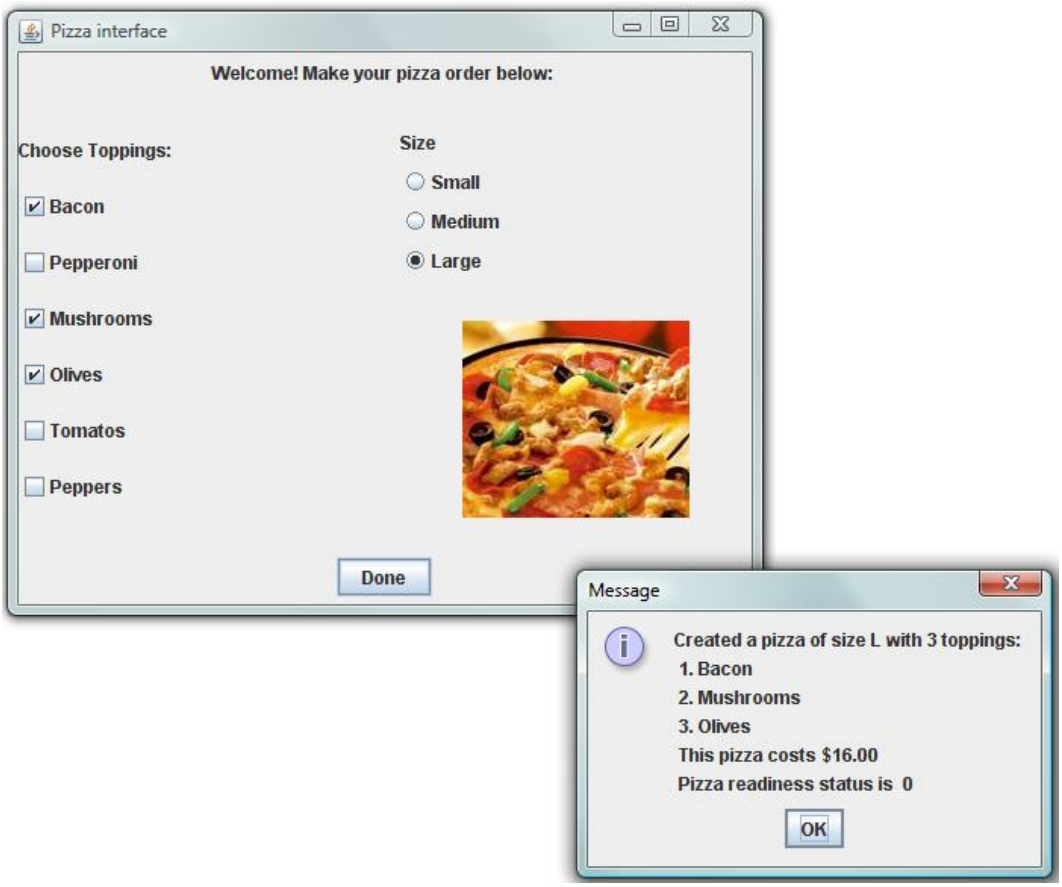
Another interaction shows how the incorrect pizza size and 0 additional toppings are handled:

```
Please enter the size of pizza (S, M or L): W
How many toppings would you like to add to the pizza?  0
Unrecognized size:  W. Setting size to M
************************************************
Created a pizza of size M with 0 toppings:
This pizza costs $9.00
Pizza readiness status is 0
************************************************
```

Add graphical user interface to work with your Pizza class. You don't need to write any additional code for this part. I am supplying a graphical interface that uses Pizza class to demonstrate how your class can be used with another class file. The supplied interface includes two files: *PizzaGUI.java* and *pic3.jpg* (an image file used by PizzaGUI.class). These two files should be placed in the same project folder, where you keep Pizza and TestPizza classes. If your project has src and bin folders, place these files in src.

When you are finished defining and testing your Pizza class, you can run the *PizzaGUI*, and it should work by allowing you to select pizza parameters and displaying the pizza information, upon clicking the Done button. The following image illustrates the *PizzaGUI* application running.

If you Pizza class is not defined according to the provided above specification, The *PizzaGUI.class* will generate an exception when you click on the Done button. This may happen if you are missing a method, or have defined it with a different set of parameters or misspelled its name. You will need to fix your code before you submit it to get full credit.



Submit *Pizza.java* and *TestPizza.java*. Note that using good programming style counts for **2 points** in this assignment. In addition to the rules of good style defined before, each method should have an introductory comment, describing its purpose, parameters and return value.