The University of Melbourne

School of Computing and Information Systems

COMP90041 Programming and Software Development

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Semester 2, 2020, Week 5

Workshop Instructions

Additional Exercises

Chap4_Question11

11. Create a class named `Pizza` that stores information about a single pizza. It should contain the following:

    - Private instance variables to store the size of the pizza (either small, medium, or large), the number of cheese toppings, the number of pepperoni toppings, and the number of ham toppings.
    - Constructor(s) that set all of the instance variables.
    - Public methods to get and set the instance variables.
    - A public method named `calcCost( )` that returns a `double` that is the cost of the pizza.

      Pizza cost is determined by:

      Small: $10 + $2 per topping
      Medium: $12 + $2 per topping
      Large: $14 + $2 per topping

    - A public method named `getDescription( )` that returns a String containing the pizza size, quantity of each topping, and the pizza cost as calculated by `calcCost( )`.

    Write test code to create several pizzas and output their descriptions. For example, a large pizza with one cheese, one pepperoni and two ham toppings should cost a total of $22.

Chap4_Question12

12. This programming project extends Programming Project 4.11. Create a `PizzaOrder` class that allows up to three pizzas to be saved in an order. Each pizza saved should be a `Pizza` object as described in Programming Project 4.11. In addition to appropriate instance variables and constructors, add the following methods:

    - `public void setNumPizzas(int numPizzas)`—sets the number of pizzas in the order. `numPizzas` must be between 1 and 3.
    - `public void setPizza1(Pizza pizza1)`—sets the first pizza in the order.
    - `public void setPizza2(Pizza pizza2)`—sets the second pizza in the order.
    - `public void setPizza3(Pizza pizza3)`—sets the third pizza in the order.
    - `public double calcTotal()`—returns the total cost of the order.

    Write a `main` method to test the class. The `setPizza2` and `setPizza3` methods will be used only if there are two or three pizzas in the order, respectively. Sample code illustrating the methods is shown below. Note that first three lines are incomplete. You must complete them as part of the Programming Project.

```
Pizza pizza1 = // Code to create a large pizza, 1 cheese, 1 ham
Pizza pizza2 = // Code to create a medium pizza, 2 cheese, 2 pepperoni
PizzaOrder order = // Code to create an order
order.setNumPizzas(2); // 2 pizzas in the order
order.setPizza1(pizza1); // Set first pizza
order.setPizza2(pizza2); // Set second pizza
double total = order.calcTotal(); // Should be 18+20 = 38
```

Chap5_Question8

8. Programming Project 4.12 asked you to create a `PizzaOrder` class that stores an order consisting of up to three pizzas. Extend this class with the following methods and constructor:
   - `public int getNumPizzas()`—returns the number of pizzas in the order.
   - `public Pizza getPizza1()`—returns the first pizza in the order or `null` if `pizza1` is not set.
   - `public Pizza getPizza2()`—returns the second pizza in the order or `null` if `pizza2` is not set.
   - `public Pizza getPizza3()`—returns the third pizza in the order or `null` if `pizza3` is not set.
   - A copy constructor that takes another `PizzaOrder` object and makes an independent copy of its pizzas. This might be useful if using an old order as a starting point for a new order.

   Write a main method to test the new methods. Changing the pizzas in the new order should not change the pizzas in the original order. For example,

```
Pizza pizza1 = // Code to create a large pizza, 1 cheese, 1 ham
Pizza pizza2 = // Code to create a medium pizza, 2 cheese,
               // 2 pepperoni
PizzaOrder order1 = // Code to create an order
order1.setNumPizzas(2); // 2 pizzas in the order
order1.setPizza1(pizza1); // Set first pizza
order1.setPizza2(pizza2); // Set second pizza
double total = order1.calcTotal(); // Should be 18+20 = 38
PizzaOrder order2 = new PizzaOrder(order1); // Use copy
                    // constructor
order2.getPizza1().setNumCheeseToppings(3); // Change toppings
double total = order2.calcTotal(); // Should be 22 + 20 = 42
double origTotal = order1.calcTotal(); // Should still be 38
```

   Note that the first three lines of code are incomplete. You must complete them as part of the Programming Project.