National Taipei University of Technology

Windows Programming (Fall 2018)

Homework #1

Deadline: 9/26 (Wed), before 2:00 PM

Attention: the rules as follows are strict, your get zero point if any of the following rules are violated.

1. No late homework is accepted.
2. Plagiarism is not allowed – every homework must be completed by yourself.

You are required to create a POS (Point of Sales) ordering system designed for restaurants. The system has two user interfaces (GUIs), customer's (frontend) and employee's (backend) interface. In this assignment, we will work on customer's interface.

This homework is incremental, that is, you have to make sure that your design is easy to maintain. You will need to extend your program in the future.

☐ [3 pts] GUI (Graphical User Interface)

In customer's GUI, there are two areas, *meal* and *order* area, as shown in Figure 1. In the meal area (on the left of Figure 1), a **GroupBox** is used to group a number of meal **Buttons.** In this assignment, you are able to name these meals and choose their prices by your own wish. You are required to figure out **15 different meals** and each single page shows only **9 Buttons**. There two buttons located on the bottom of the meal area, a Next Page Button and a Previous Page Button, which used to switch pages. A **Label** is needed to show the current page number of the menu. Above those buttons, there is an Add Button which allow the customer to add meals to the order list. In the order area (on the right of Figure 1), a **DataGridView** lists the meals that the customer ordered. It is occupied by 2 *columns*, including *name* and *unit price* of the meals. On the bottom, a **Label** is required to show the total price of all ordered meals.

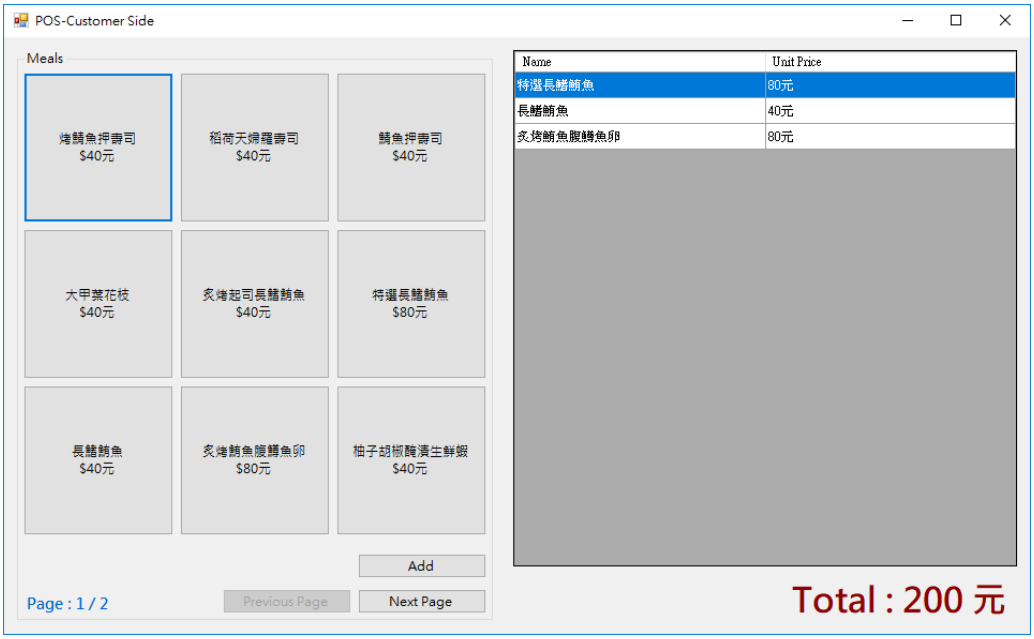

Figure 1. The GUI of this homework

☐ [3 pts] Page Switching

Each page contains only 9 different meal buttons. Since you are required to create 15 different meal buttons, we need a page switching function to divide the 15 meal buttons into 2 pages. As shown in Figure 2 and Figure 3, page 1 shows the first 9 meal buttons and it will switch to page 2 which shows another 6 meal buttons when the “Next Page” Button is clicked. Moreover, a Label is required to show the current page number of the menu.

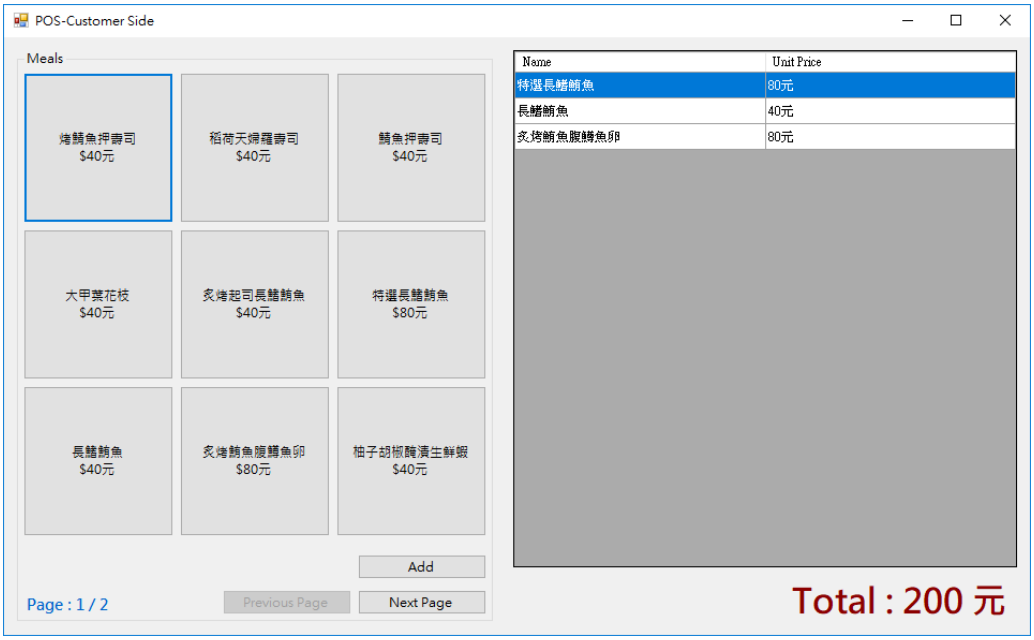

Figure 2. Before switching the page

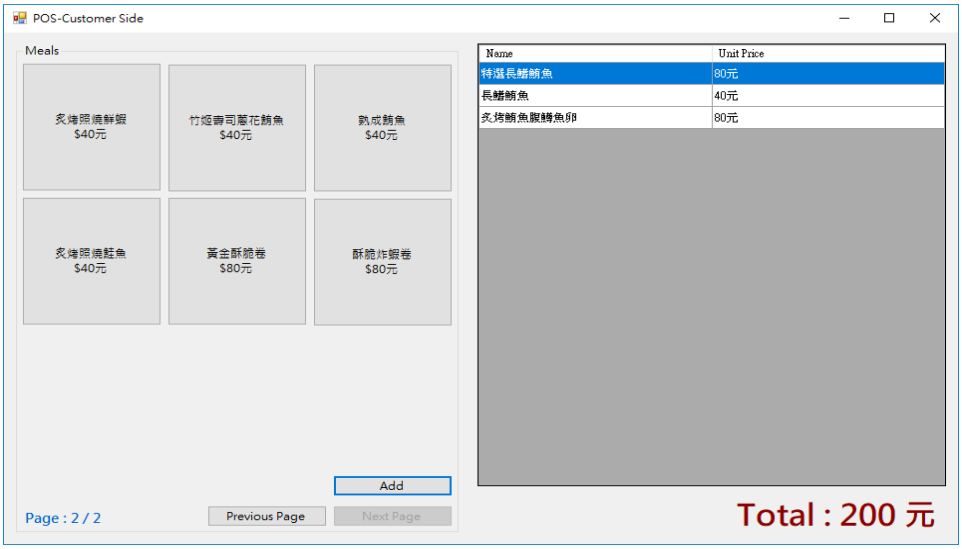

Figure 3. After switching the page

☐ [5 pts] Customer Orders

When a customer selects a meal and clicks on the add meal button, the system records the selected meal in the **DataGridView** of the order area. The **DataGridView** will list out all of the *name* and *unit price* of the meal, even if the same meal has been added. At the bottom, a *total* **Label** shows the total price. For example, a customer ordered a meal which cost 125 dollars, the label should show 125 and if the customer add on a 130 dollars' meal, the **Label** should show 255, and so on.

Figure 4. The DataGridView shows what customer ordered

☐ [2 pts] UI Control

Controls should be enabled/disabled properly depend on the state of the program. For example, the previous page button should be disabled when the current page is the first page, and if there are no more pages, then next page button should be disabled.

☐ [5 pts] Model View Controller (MVC) Pattern

Your program will be graded base on the quality of your MVC design. You should make your UI as thin as possible to avoid the fat view smell. For example, the meal buttons may not handle the logics of recording data to DataGridView. Instead, the handler should simply delegate the logic to the model (by calling a method of the model). In addition, a good design must enforce a one-way dependency. You are encouraged to follow the reference class diagram shown in Figure 5.

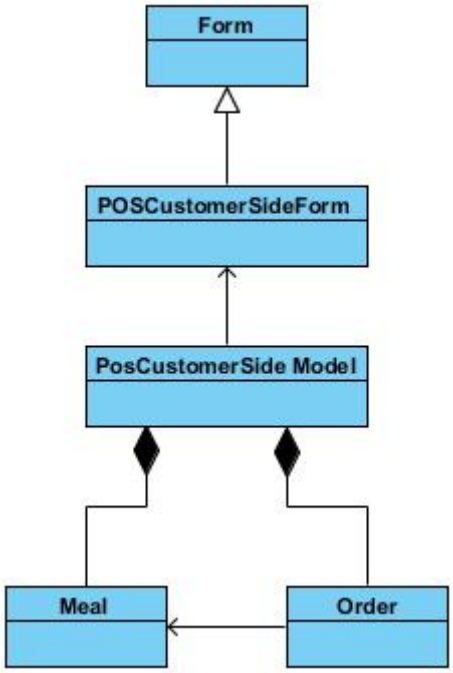

Figure 5. A reference class diagram

☐ [7 pts] Code Quality

The grading of code quality will be based on whether your programs have bad smells. Your score depends on the smell density (number of smells per thousand lines of code) of your code. **You have to ensure that the code generated by Windows Form Designer do not infringe your coding standard**.

☐ [2 pts] Summary

You are required to turn in your homework summary with time log (the time in hours that you spent in this homework, including documentation, as precisely as possible) in Word format. Please download a template from the instructor's website.

Additional Information

The following information may useful to your homework. If you need more details, please reference to the textbook or MSDN website.

1. List – You can use the following code to add some data into a List.

```
using System.Collections.Generic;
…
…
List<Meal> _mealList = new List<Meal>();
Meal bigMac = new Meal();
…
…
_mealList.Add(bigMac);
…
```

For more information, please visit MSDN :
https://msdn.microsoft.com/zh-tw/library/6sh2ey19(v=vs.110).aspx

2. DataGridView – You can use the following code to show the values in a multi-column DataGridView.

```
DataGridView recordDataGridView = new DataGridView();
recordDataGridView.AutoSizeColumnsMode =
System.Windows.Forms.DataGridViewAutoSizeColumnsMode.Fill;
recordDataGridView.ColumnHeadersHeightSizeMode =
System.Windows.Forms.DataGridViewColumnHeadersHeightSizeMode.AutoSize;
recordDataGridView.Columns.AddRange(new System.Windows.Forms.DataGridViewColumn[] {
            "MealName",
            "Unit Price",
            "Qty",
            "Subtotal" });
recordDataGridView.Name = "recordDGV";
recordDataGridView.ReadOnly = true;
recordDataGridView.RowHeadersVisible = false;
recordDataGridView.SelectionMode = System.Windows.Forms.DataGridViewSelectionMode.FullRowSelect;
```

For more information, please visit MSDN:
https://msdn.microsoft.com/zh-tw/library/system.windows.forms.datagridview(v=vs.110).aspx