National Taipei University of Technology

Windows Programming (Fall 2018)

Homework #3

Deadline: 10/24 (Wed), before 2:00 PM

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

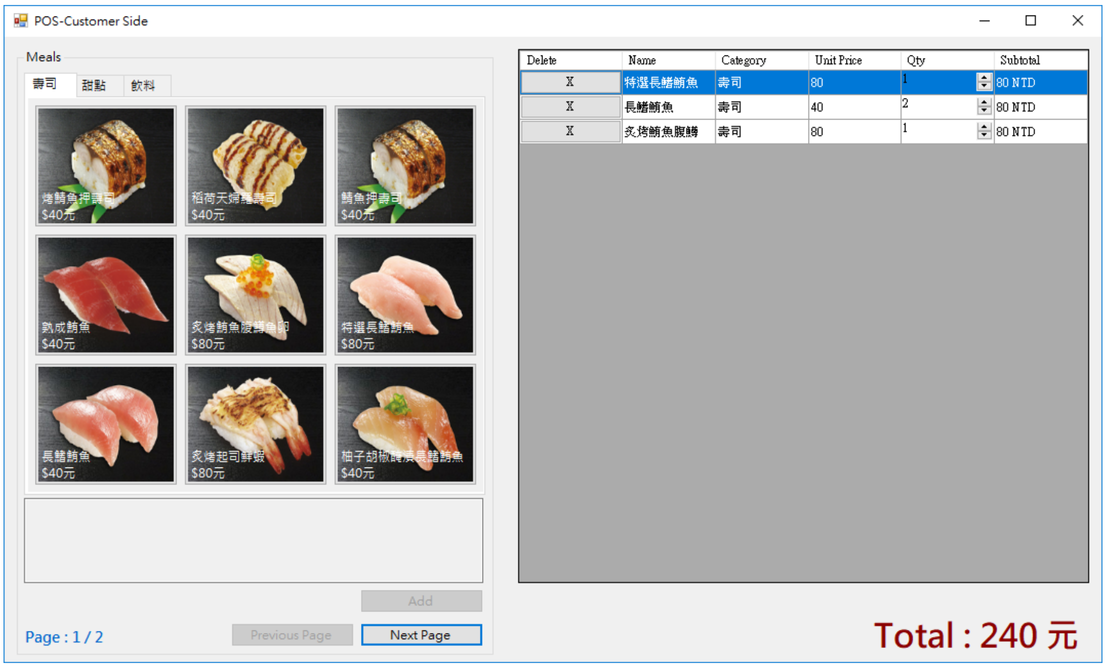
1. No late homework is accepted.
2. Plagiarism is not allowed – every homework must be completed by your own.

In this homework, we will start working on restaurant program. In restaurant program, the employee can manage (add, edit, and delete) meals. We will add a *category* attribute for the meals. We need a user interface that can manage (add, rename or delete) categories. In addition, whenever a meal's or category's attribute is changed, the customer program should display the corresponding change.

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

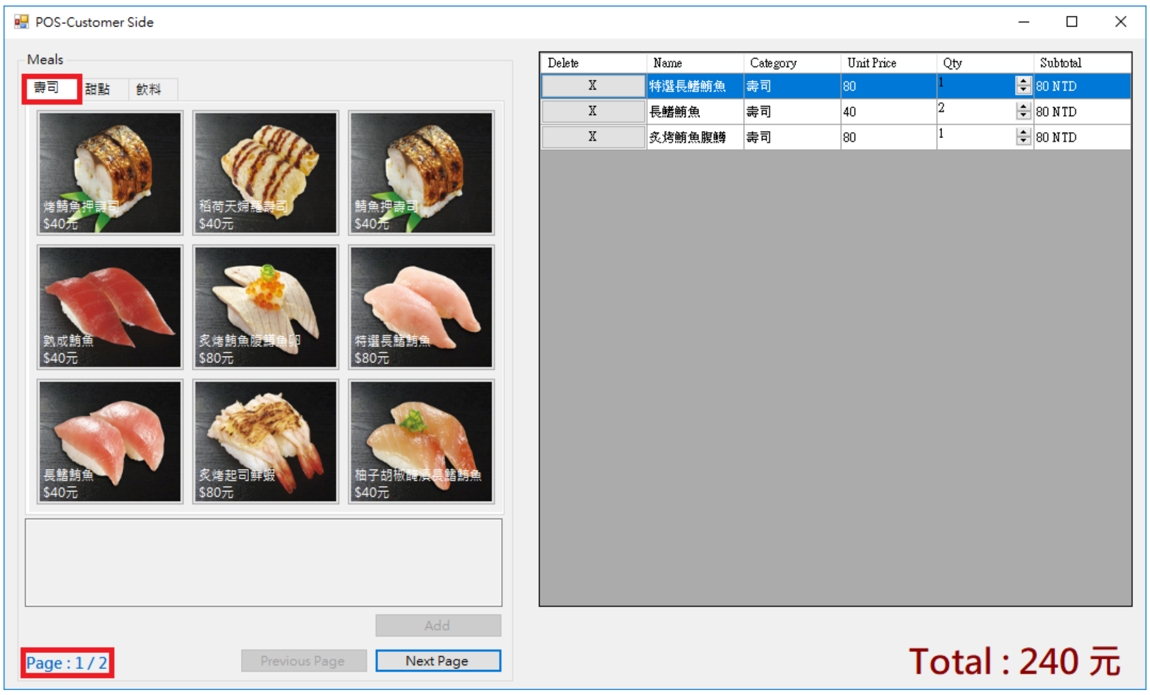
[1 pts] Customer Program GUI

In customer program, the **DataGridView** will need three **columns** to display the meal's category, quantity and Subtotal. In addition, we will add a **TabControl** in order to categorize the meal. The meals which are in the same category should be placed in the same **TabPage**. As before, a a **TabPage** can only contain nine buttons. Therefore, you need to keep the page switching function working in each tab page. **(A TabPage can contain several pages)**

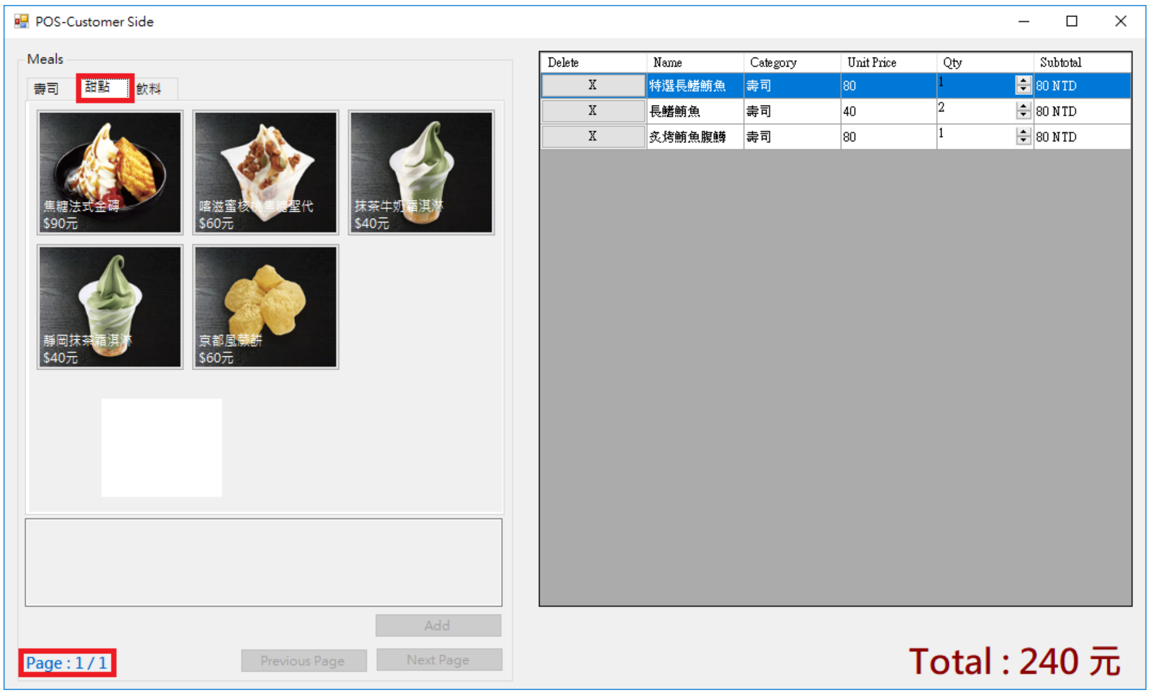


Delete	Name	Category	Unit Price	Qty	Subtotal
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	長鰭鮪魚	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD

Figure 1. The GUI of Customer Program in this homework.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	長鰭鮪魚	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD



Delete	Name	Category	Unit Price	Qty	Subtotal
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	長鰭鮪魚	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD

Figure 2. The page number (indicated by the red frame) depends on the number of meals in that category.

[3 pts] Using NumericUpDown to Change Quantity of the Order

We have quantity column that apply **DataGridViewNumericUpDownColumn** in the **DataGridView.** You can use NumericUpDown Button (or so-called *Spin Button*) to adjust the quantity of a particular meal in the order. Similarly, you should update subtotal and total price when the quantity is changed.

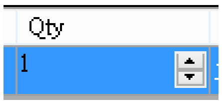
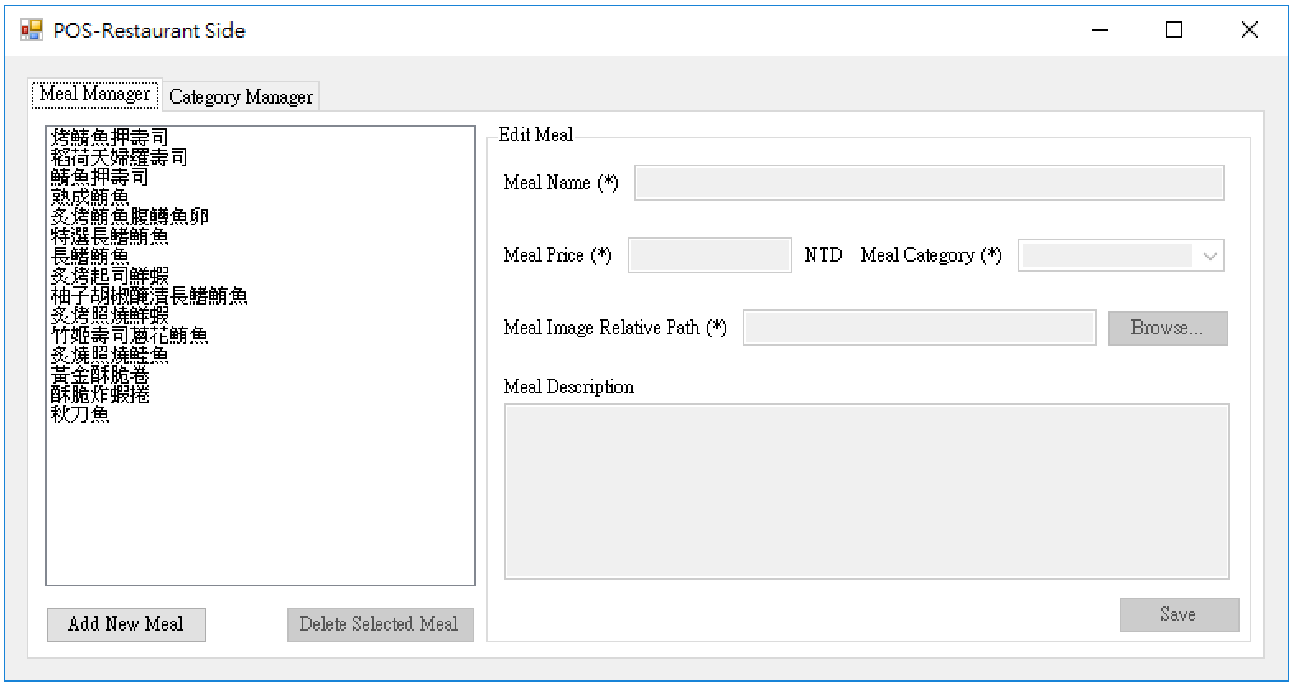


Figure 10. A DataGridView has a NumericUpDown column let user can adjust the quantity of the order.

[1 pts] Restaurant Program GUI

In the restaurant program, a **TabControl** is used to distinguish two management functions: Meal Manager and Category Manager. Each manager is managed in a different **TabPage**. Let’s begin with Meal Manager **TabPage** first. On the left side is a **ListBox** that lists all the meals in the system. An ‘Add New Meal’ **Button** that adds a meal to the system. A ‘Delete Selected Meal’ **Button** that deletes a selected meal in the **ListBox**. On the right side is a **GroupBox** that is used to group the controls shown in Figure 2. In the **GroupBox**, the **TextBox**s are used to input Meal Name, Meal Price, and Meal Image Relative Path. A Meal Category **ComboBox** is used to choose the meal’s category. A multi-line **TextBox** is used to input the description of the meal. When clicking ‘Browse…’ Button, an **OpenFileDialog** will show up for the user to choose the image for the Meal. A Save (in edit mode)/Add (in add mode) **Button** is used to save/add a meal to the system.

We now discuss Category Manager **TabPage**. On the left side is a **ListBox** listing all categories in the system. An ‘Add Category’ **Button** is used to add a category to the system. A ‘Delete Selected Category’ **Button** is used to delete a category from the system. On the right side, a **GroupBox** is used to group the controls shown in Figure 3. A **TextBox** is used to input the Category’s name. A **ListBox** lists the meals using the category. A Save (in edit mode)/Add (in add mode) **Button** is used to save/add a category to system.



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Figure 3. The GUI of Restaurant Program in this homework. (On Meal Manager **TabPage**)

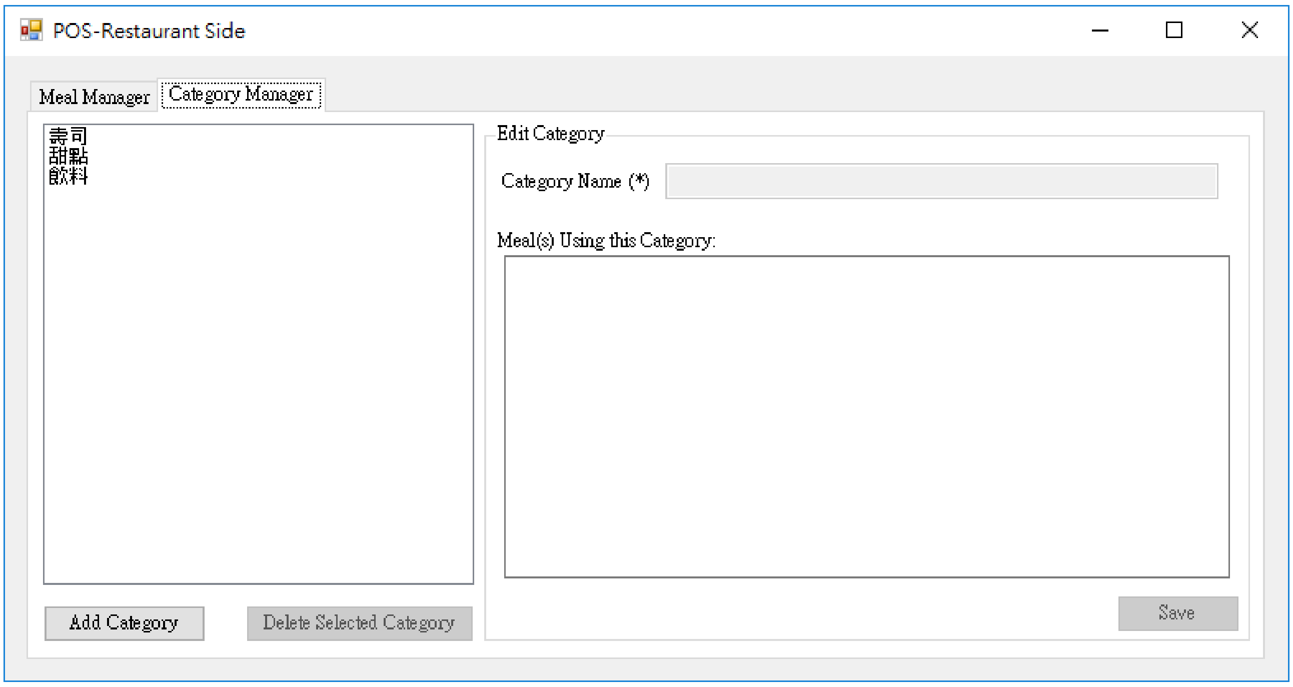


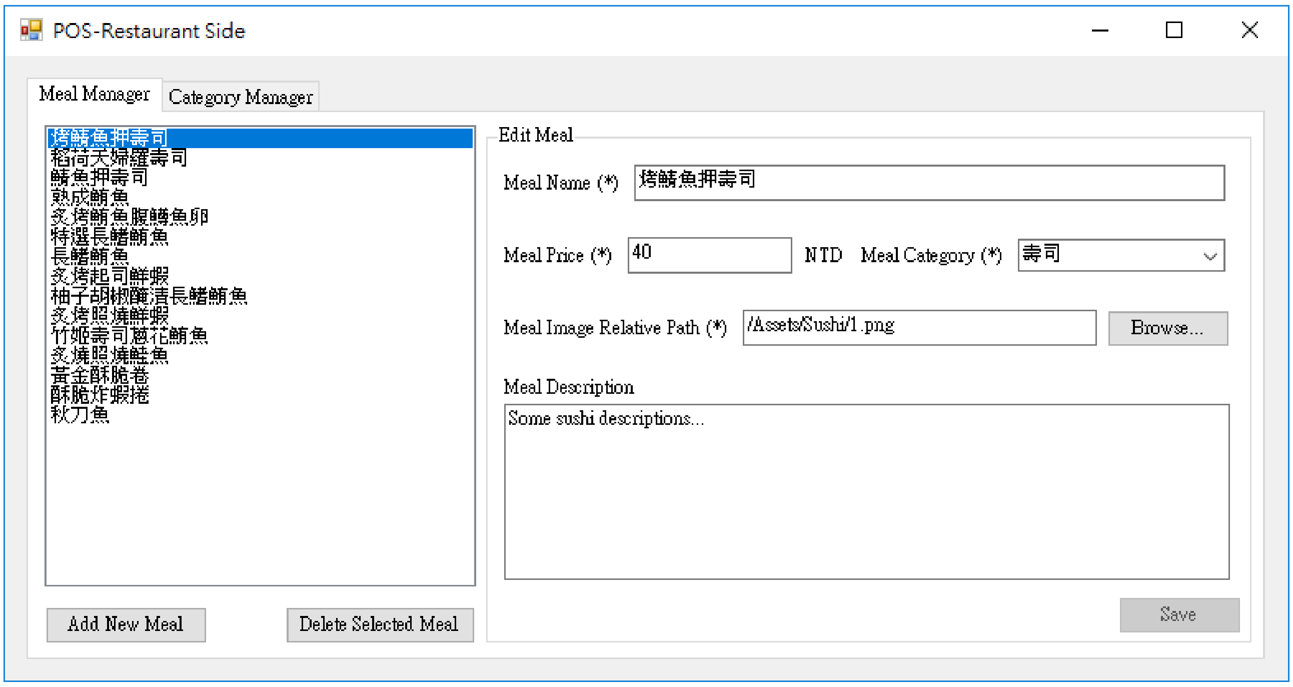
Figure 4. The GUI of Restaurant Program in this homework. (On Category Manger **TabPage**)

[2 pts] Adding Category Attribute to each Meal

You are required to add a category attribute to each meal. Categorizing meals help customers to find meals more quickly. You need to setup at least three different default categories. You also need to choose **one category** that **contains at least 15 default meals**. The rest of the categories should **contain at least 6 default meals**. For instance, if you choose the category ‘sushi’ to contain 15 default sushi, you should set up at least 6 default desserts in the ‘Dessert’ category and 6 default drinks in the ‘Beverage’ category.

[3 pts] Editing Meal’s Information

The restaurant program will have a ‘Meal Manager’ tab page in order to manage the meals in the system. A user can edit a meal’s information such as its name, unit price, category, image path, and meal descriptions. First, the user selects a meal to edit from **ListBox**. Then, the selected meal’s information will be shown on the right side automatically. The title of **GroupBox** on the right of **TabPage** will display ‘Edit Meal’ and the bottom Button will display ‘Save’ indicating that editing is progress. When the meal’s information is modified, clicking ‘Save’ Button updates the meal’s information. Note that except for meal descriptions, the other fields such as name, unit price, category, and image path are all required fields. If the user does not fill the required field, the save **Button** should be disabled. An employee can change a meal’s image path by entering the relative path to the **TextBox** or by clicking ‘Browse…’ **Button** that opens an **OpenFileDialog** for the user to choose an image for the meal. The initial directory of the **OpenFileDialog** should be sited in the directory of your project. Note that if you use the **OpenFileDialog** to obtain a file path, you need to convert the **absolute path** to **relative path** then fill the converted result to the ‘Meal Image Relative Path’ **TextBox**. When an employee has updated the meal’s information, the meal in the customer’s program should also be updated simultaneously. In particular, if the order list (DataGridView) in the customer program has a meal which has been updated in the restaurant program, the order’s information (unit price, subtotal and total) should also be updated simultaneously.



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Meal Name (*) 烤鯖魚押壽司

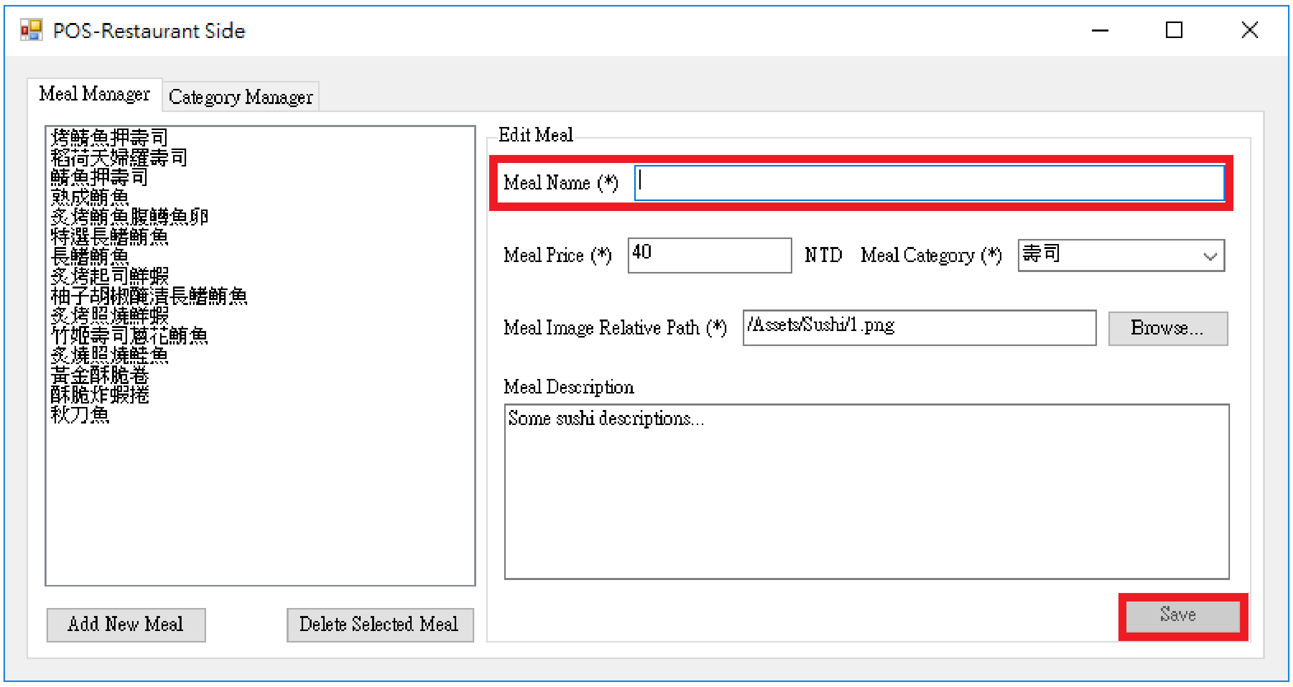
Meal Price (*) 40 NTD Meal Category (*) 壽司

Meal Image Relative Path (*) /Assets/Sushi/1.png

Meal Description

Some sushi descriptions...

Figure 5. When the employee selects a meal from the **ListBox**, the selected meal’s information will fill the right side’s controls automatically



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Meal Name (*)

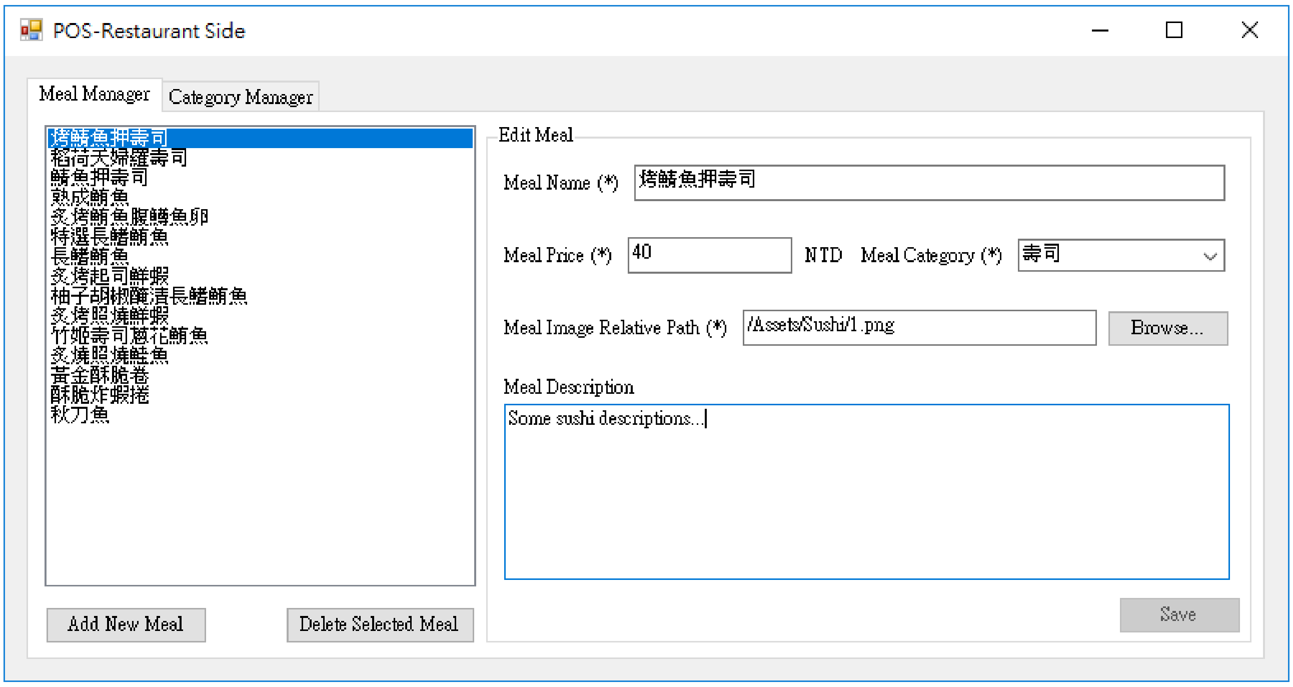
Meal Price (*) 40 NTD Meal Category (*) 壽司

Meal Image Relative Path (*) /Assets/Sushi/1.png

Meal Description

Some sushi descriptions...

Figure 6. If a user does not input the required fields, the save button is disabled.


POS-Restaurant Side

Meal Manager | Category Manager

烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Edit Meal

Meal Name (*): 烤鯖魚押壽司

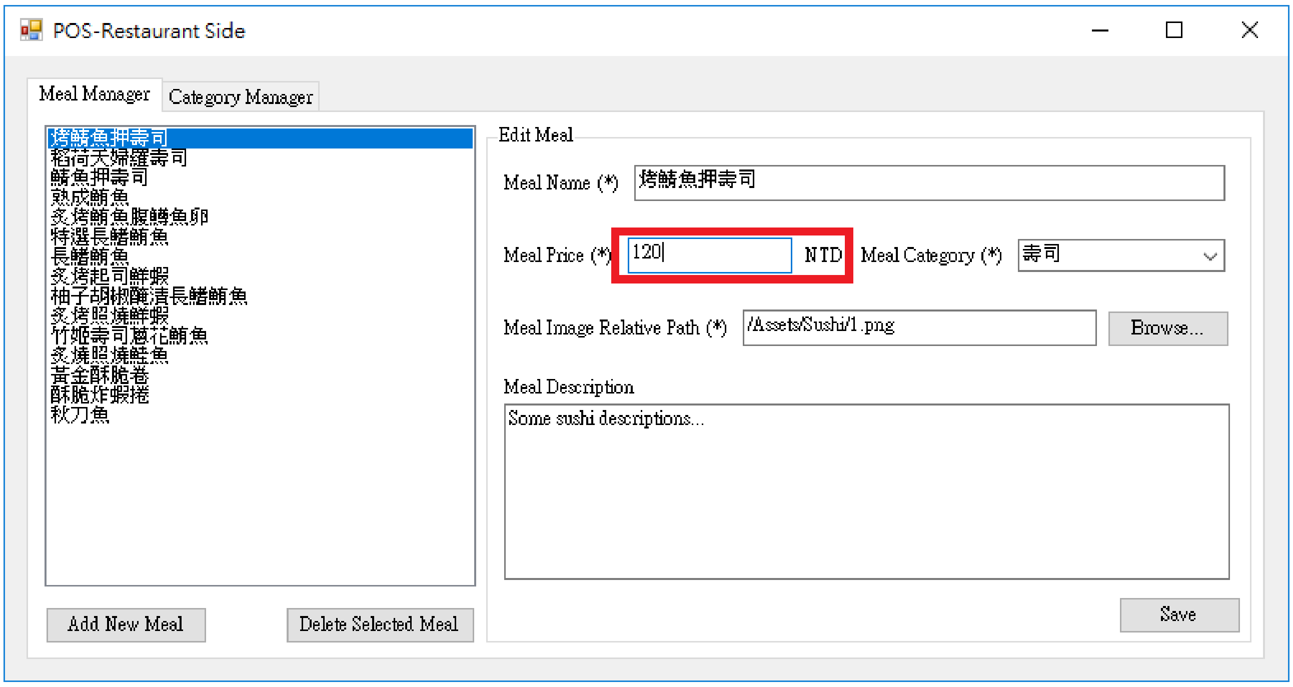
Meal Price (*): 40 NTD

Meal Category (*): 壽司

Meal Image Relative Path (*): /Assets/Sushi/1.png

Meal Description: Some sushi descriptions...

Figure 7. The original data of selected sushi.


POS-Restaurant Side

Meal Manager | Category Manager

烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Edit Meal

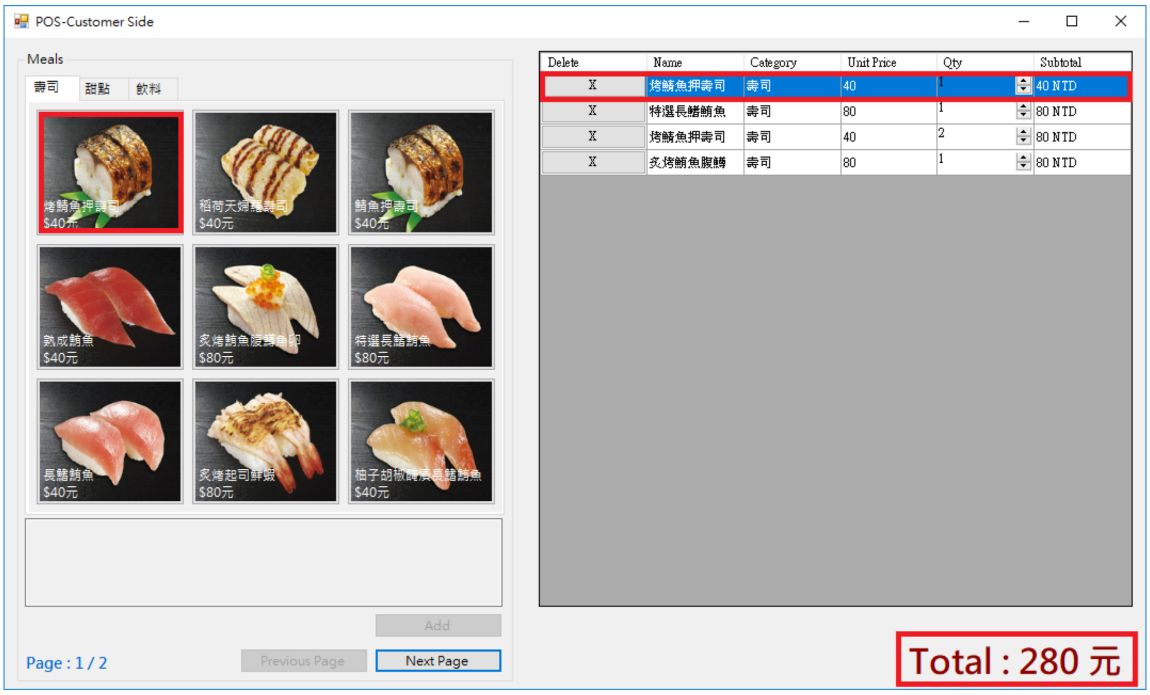
Meal Name (*): 烤鯖魚押壽司

Meal Price (*): 120 NTD

Meal Category (*): 壽司

Meal Image Relative Path (*): /Assets/Sushi/1.png

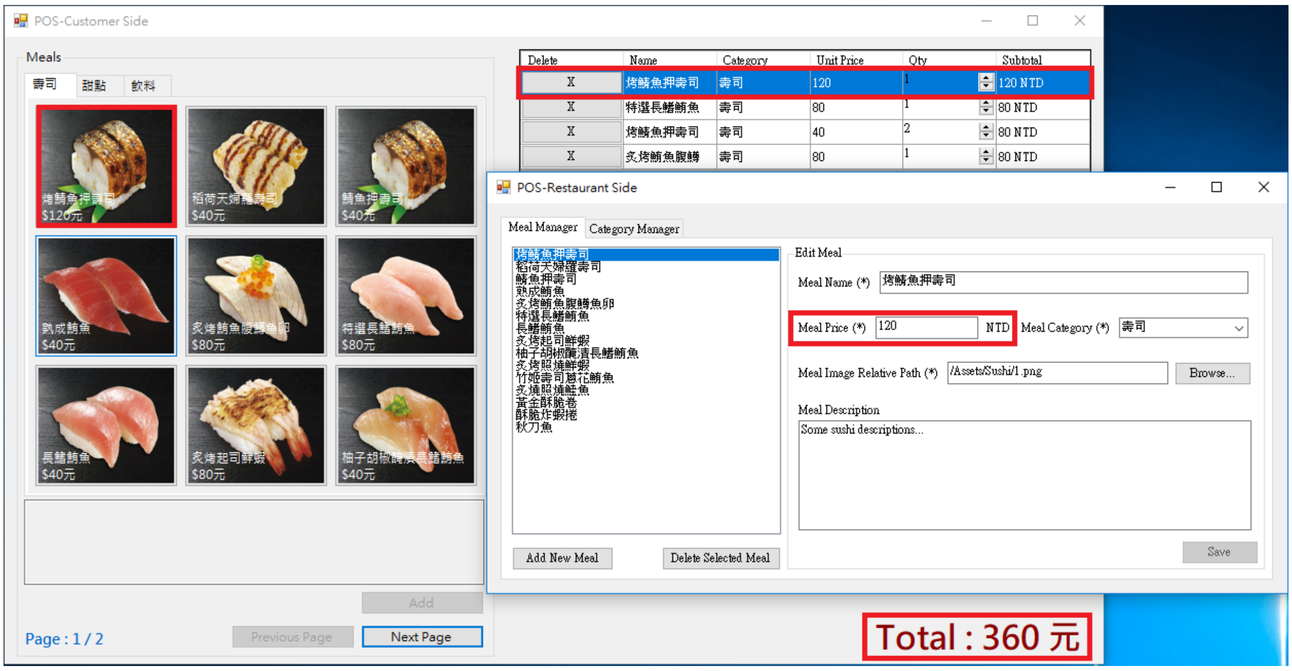
Meal Description: Some sushi descriptions...



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	40	1	40 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD

Total : 280 元

Figure 8. Changing the meal’s data before saving them.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD

烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Edit Meal

Meal Name (*) 烤鯖魚押壽司

Meal Price (*) 120 NTD Meal Category (*) 壽司

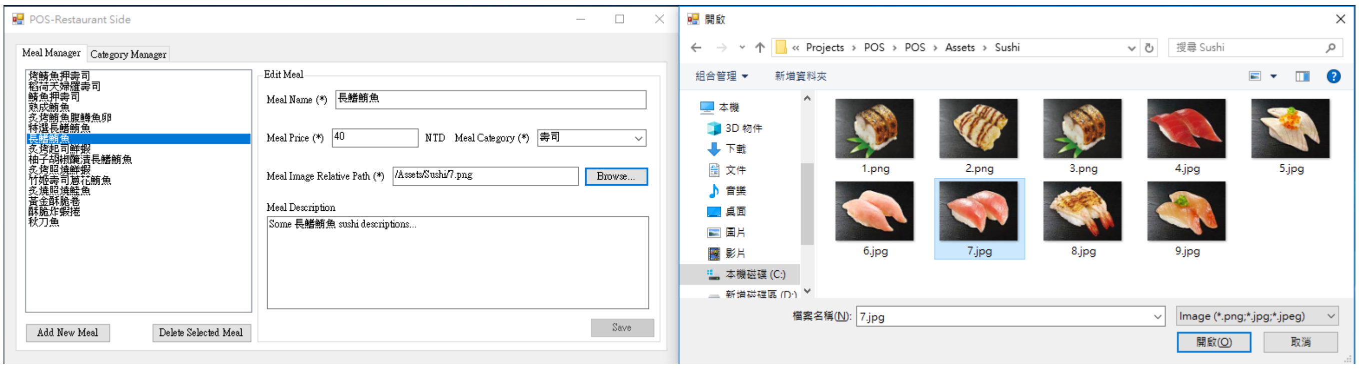
Meal Image Relative Path (*) /Assets/Sushi/1.png

Meal Description

Some sushi descriptions...

Total : 360 元

Figure 9. When clicking the save button, the corresponding meal and order in customer program should be updated.



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚

Edit Meal

Meal Name (*) 長鰭鮪魚

Meal Price (*) 40 NTD Meal Category (*) 壽司

Meal Image Relative Path (*) /Assets/Sushi/7.png

Meal Description

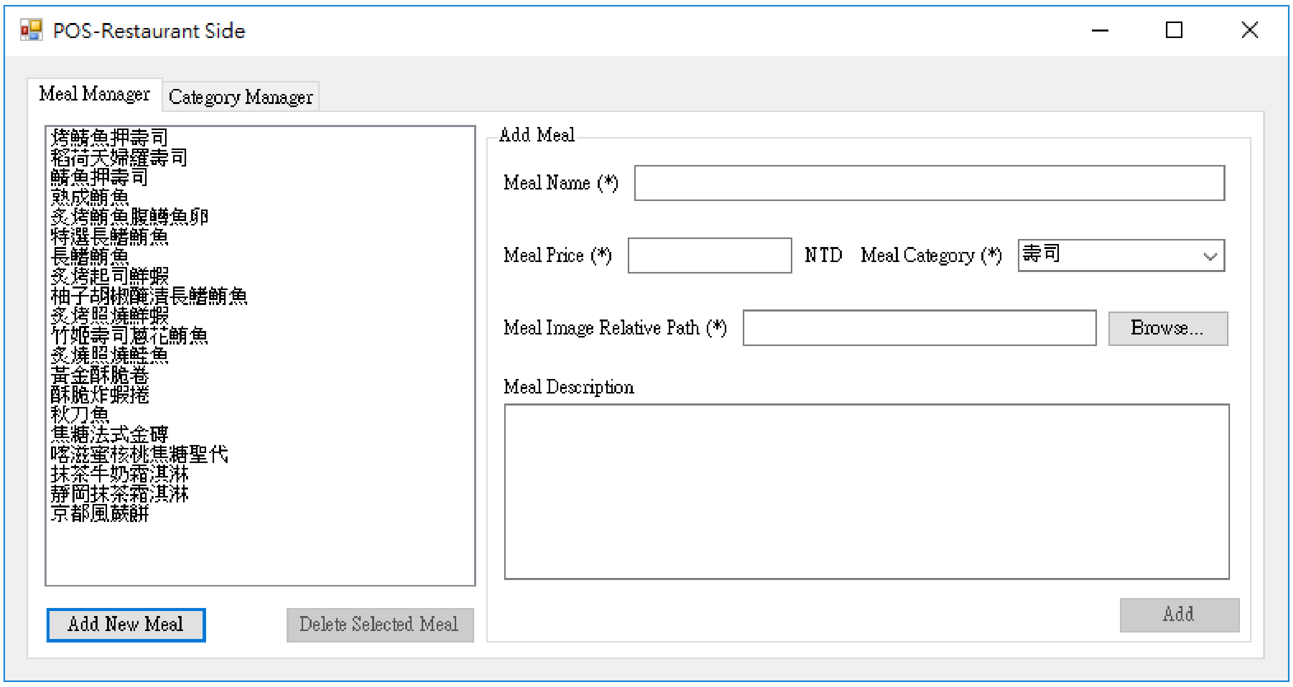
Some 長鰭鮪魚 sushi descriptions...

檔案名稱(N): 7.jpg

Figure 10. The employee can click ‘Browse…’ Button to open an **OpenFileDialog** to choose an image for the meal.

[2 pts] Adding a Meal

On Meal Manager **TabPage** in the restaurant program, an employee can add a meal to the system. A meal has a name, price, category, image path and description. However, the description is optional. This function is similar to ‘editing meal’. But the title of **GroupBox** is changed to ‘Add Meal’ and the right side’s fields are empty. The category **ComboBox** is set to the category at index 0 by default. The ‘Save’ **Button** becomes ‘Add’ **Button** and the **Button** is disabled by default. When the user fills all required fields, the ‘Add’ Button is enabled. After addinng a meal to the system, the new meal should show up in the **ListBox** and the customer program should be updated simultaneously.



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚
焦糖法式金磚
嗒滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅

Add Meal

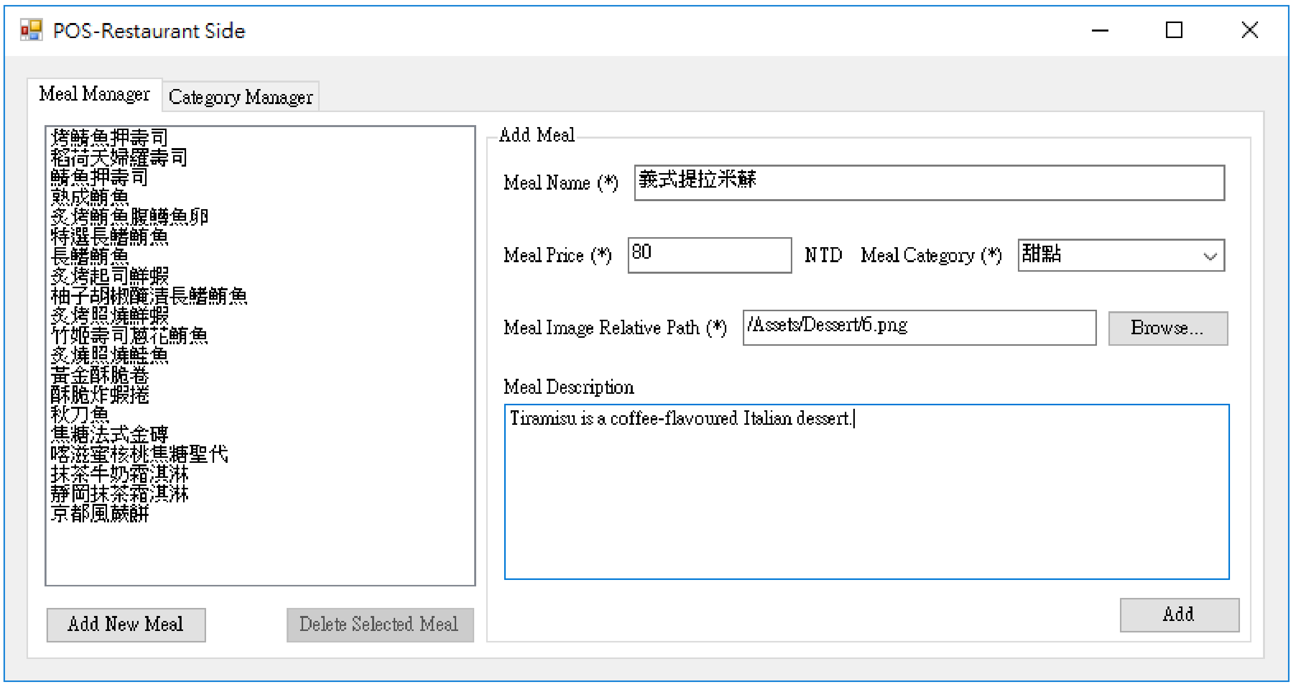
Meal Name (*)

Meal Price (*) NTD Meal Category (*) 壽司

Meal Image Relative Path (*)

Meal Description

Figure 9. After the employee clicks the ‘Add New Meal’ Button, the right side switches to ‘Add New Meal’ mode.



烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚
焦糖法式金磚
嗒滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅

Meal Name (*) 義式提拉米蘇

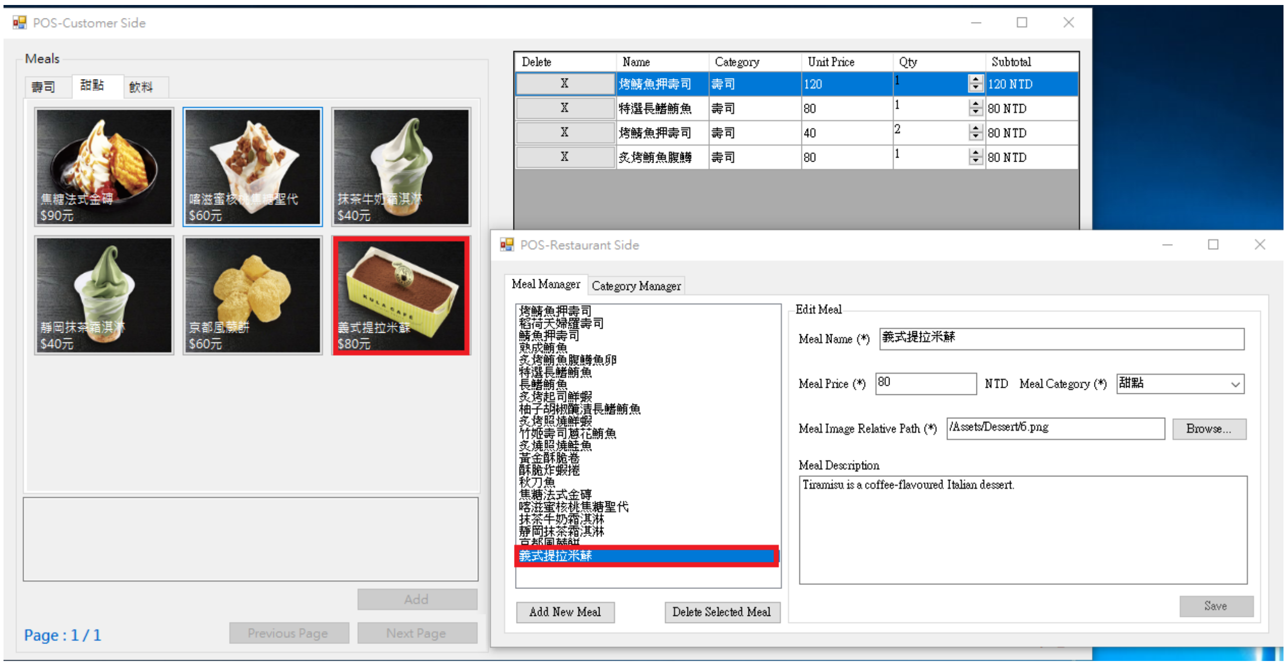
Meal Price (*) 80 NTD Meal Category (*) 甜點

Meal Image Relative Path (*) /Assets/Dessert/6.png

Meal Description

Tiramisu is a coffee-flavoured Italian dessert.

Figure 10. Before clicking the ‘Add’ button.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD

烤鯖魚押壽司
稻荷天婦羅壽司
鯖魚押壽司
熟成鮪魚
炙烤鮪魚腹鱒魚卵
特選長鰭鮪魚
長鰭鮪魚
炙烤起司鮮蝦
柚子胡椒醃漬長鰭鮪魚
炙烤照燒鮮蝦
竹姬壽司蔥花鮪魚
炙燒照燒鮭魚
黃金酥脆卷
酥脆炸蝦捲
秋刀魚
焦糖法式金磚
嗒滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅
義式提拉米蘇

Meal Name (*) 義式提拉米蘇

Meal Price (*) 80 NTD Meal Category (*) 甜點

Meal Image Relative Path (*) /Assets/Dessert/6.png

Meal Description

Tiramisu is a coffee-flavoured Italian dessert.

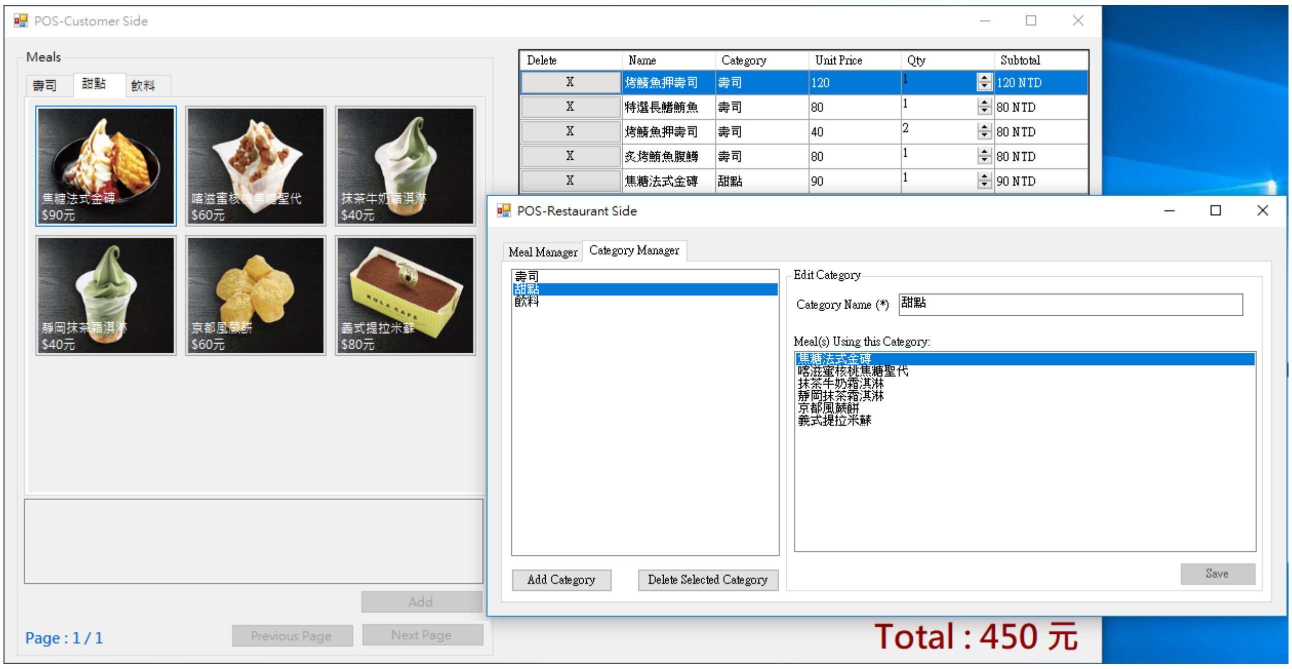
Figure 11. After adding a meal to the system, the new meal is added to **ListBox** and the customer program shows up the meal that was added.

[2 pts]Deleting a Meal

In Meal Manager, when selecting a meal from **ListBox**, one can click ‘Delete Selected Meal’ **Button** to delete the selected meal. After deleting the meal, the customer program should be updated simultaneously. Note that, to make it simpler, if there are any orders containing the meal to be deleted, the deletion is not allowed.

[2 pts] Editing a Category

In Category Manager, the user can edit a category by selecting it from the **ListBox** on the left half side. The **GroupBox's** title displays 'Edit Category' and the bottom **Button** on the right displays the text 'Save', indicating that the system is in edit mode now. A category has a name and a list of the meals using this category. One can only edit the name of category. The list simply lists all the meals using the category. Similarly, if the required field is not filled, the 'Save' **Button** should be disabled. When a category is saved to the system, the category name in the **ListBox** and the category **TabPage's** text in the customer program should be changed simultaneously.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鰭	壽司	80	1	80 NTD
X	焦糖法式金磚	甜點	90	1	90 NTD

壽司
甜點
飲料

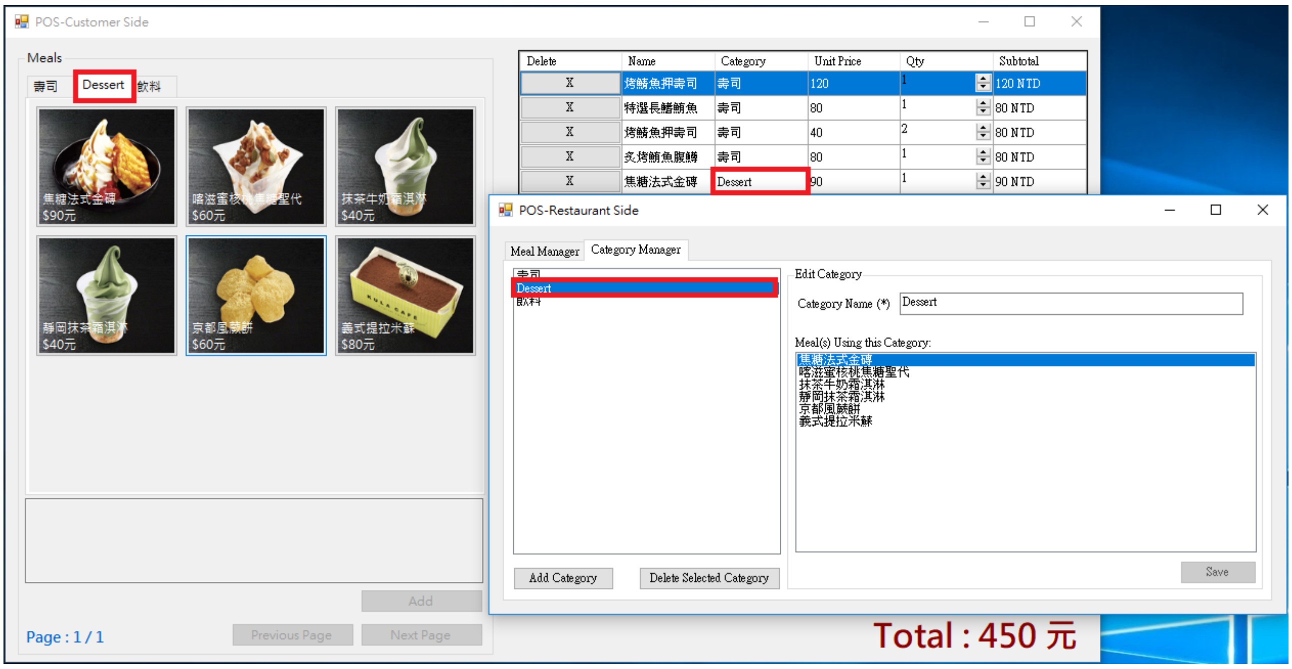
Edit Category

Category Name (*) 甜點

Meal(s) Using this Category:

焦糖法式金磚
嗜滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅
義式提拉米蘇

Figure 14. Before saving the category



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鰭	壽司	80	1	80 NTD
X	焦糖法式金磚	Dessert	90	1	90 NTD

壽司
Dessert
飲料

Edit Category

Category Name (*) Dessert

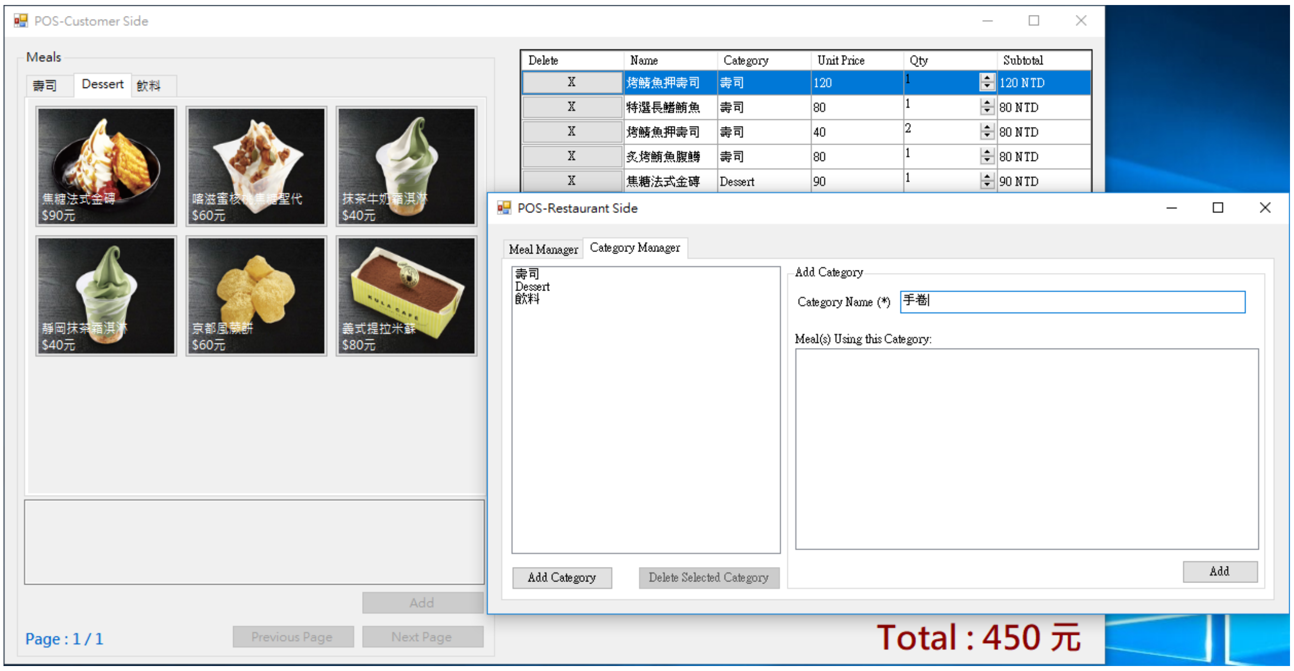
Meal(s) Using this Category:

焦糖法式金磚
嗜滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅
義式提拉米蘇

Figure 15. After saving the category.

[2 pts] Adding a Category

In Category Manager, the user can add a new category to the system by clicking ‘Add Category’ Button. When the user clicks ‘Add Category’ **Button**, the controls on the right should enter ‘Add Mode’. That is, the **GroupBox’s** text is changed to ‘Add Category’ and the bottom **Button’s** text changed to ‘Add’. Of course, all required field(s) should be filled before ‘Add’ **Button** is enabled. When clicking ‘Add’ **Button**, the **ListBox** shows the new category and a **TabPage** with the newly added category’s name should show up in the **TabControl**.


POS-Customer Side

Meals

壽司 | Dessert | 飲料

焦糖法式金磚 $90元
嗜滋蜜核桃焦糖聖代 $60元
抹茶牛奶霜淇淋 $40元
靜岡抹茶霜淇淋 $40元
京都風蕨餅 $60元
義式提拉米蘇 $80元

Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD
X	焦糖法式金磚	Dessert	90	1	90 NTD

Page : 1 / 1

Total : 450 元

POS-Restaurant Side

Meal Manager | Category Manager

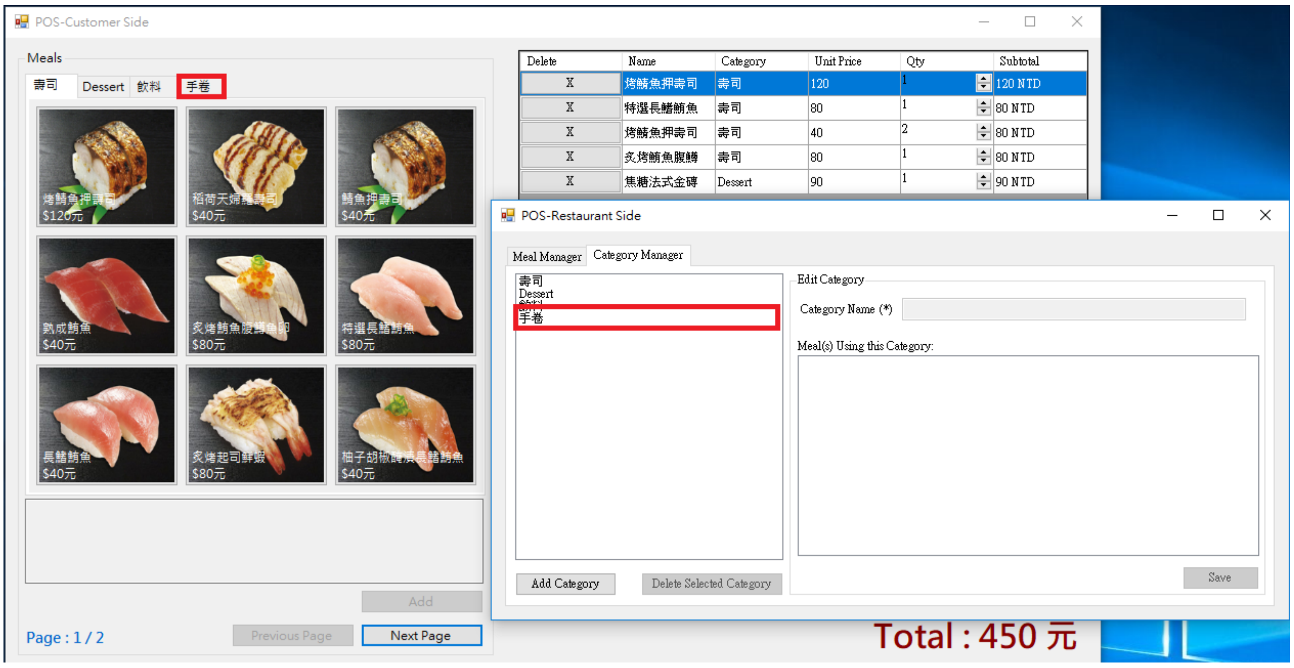
壽司
Dessert
飲料

Add Category

Category Name (*) 手卷

Meal(s) Using this Category:

Figure 16. Before adding a category.


POS-Customer Side

Meals

壽司 | Dessert | 飲料 | 手卷

烤鯖魚押壽司 $120元
稻荷天婦羅壽司 $40元
鯖魚押壽司 $40元
熟成鮪魚 $40元
炙烤鮪魚腹鮭魚卵 $80元
特選長鰭鮪魚 $80元
長鰭鮪魚 $40元
炙烤起司鮮蝦 $80元
柚子胡椒醃漬長鰭鮪魚 $40元

Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD
X	焦糖法式金磚	Dessert	90	1	90 NTD

Page : 1 / 2

Total : 450 元

POS-Restaurant Side

Meal Manager | Category Manager

壽司
Dessert
飲料
手卷

Edit Category

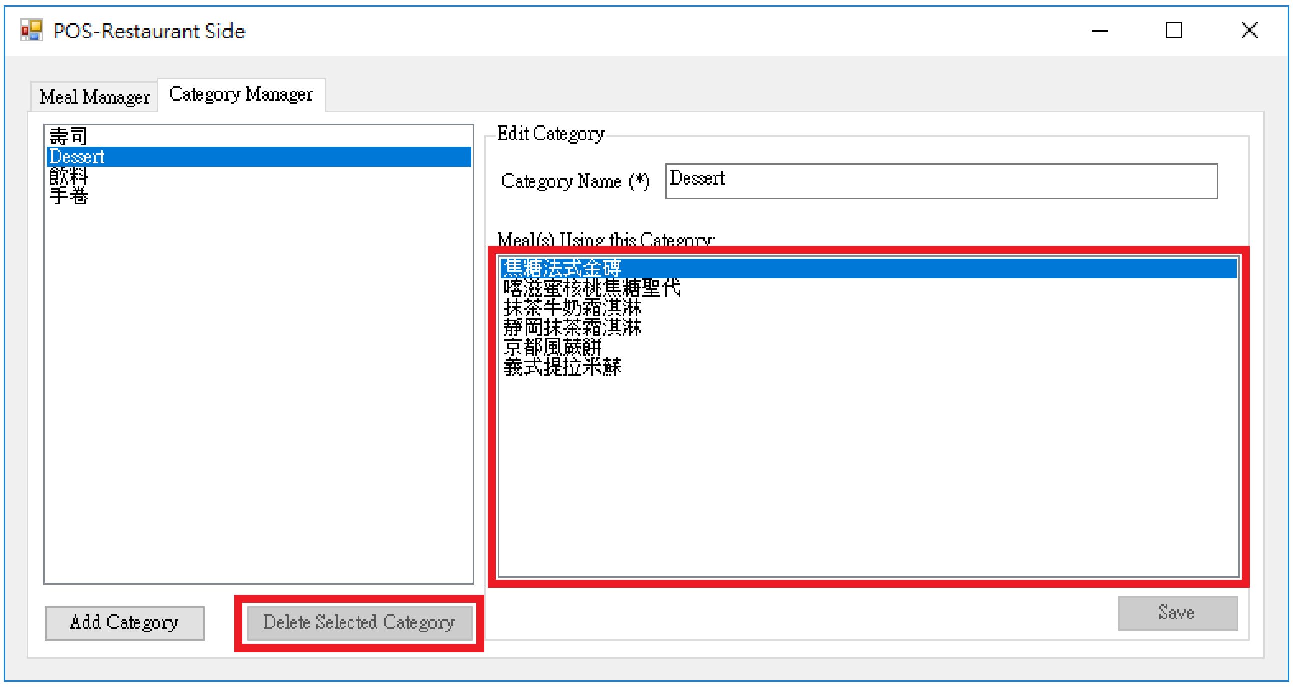
Category Name (*)

Meal(s) Using this Category:

Figure 17. After adding a category.

[1 pts] Deleting a Category

In Category Manager, when clicking ‘Delete Selected Category’ **Button**, the category should be deleted. Note that the ‘Delete Selected Category’ **Button** is enabled only when the category does not contain any meals. After deleting a category, the category should be remove from **ListBox** and the category **TabPage** in the customer program should also be removed.



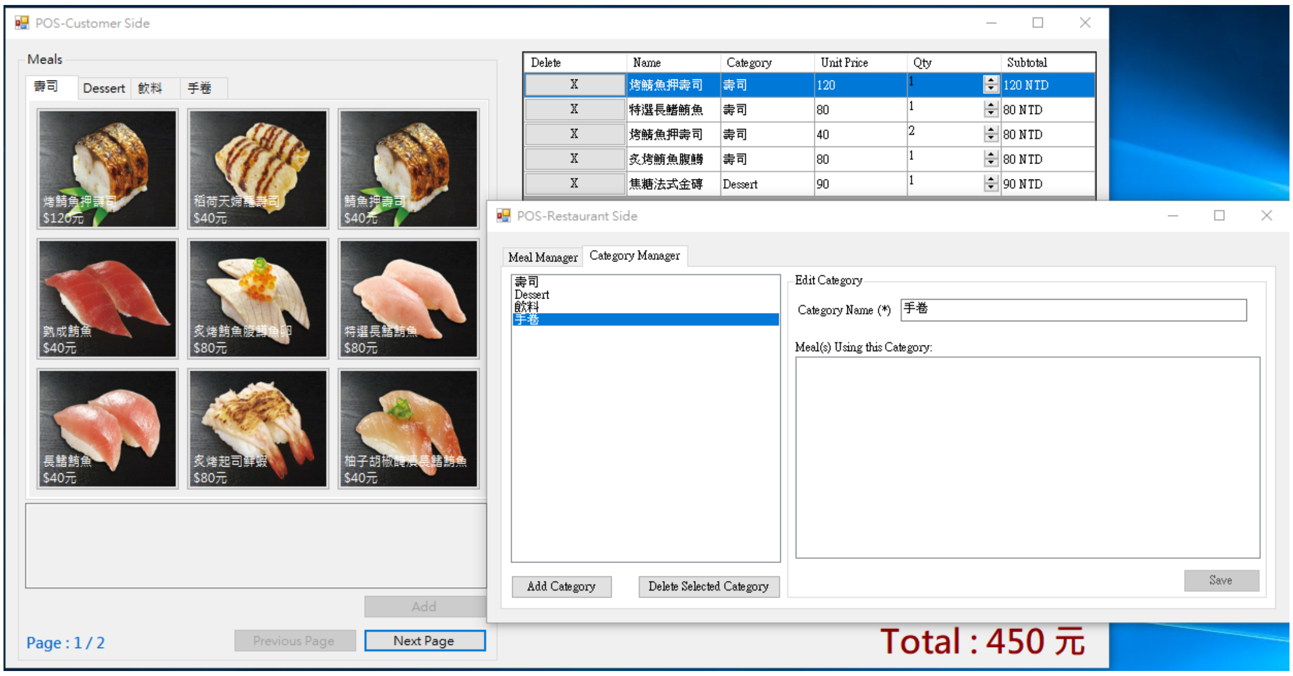
壽司
Dessert
飲料
手卷

Category Name (*) Dessert

Meal(s) Using this Category:

焦糖法式金磚
嗜滋蜜核桃焦糖聖代
抹茶牛奶霜淇淋
靜岡抹茶霜淇淋
京都風蕨餅
義式提拉米蘇

Figure 18. If there are any meals exist in the category, it can’t be deleted.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD
X	焦糖法式金磚	Dessert	90	1	90 NTD

Page : 1 / 2

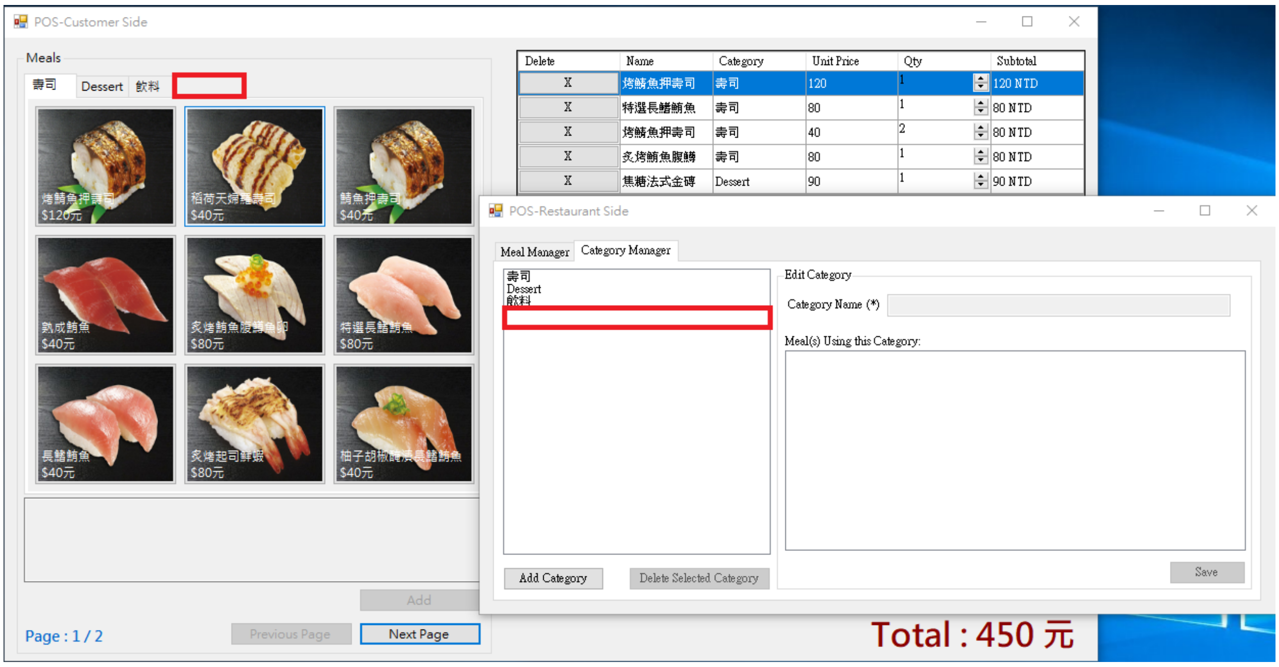
Total : 450 元

壽司
Dessert
飲料
手卷

Category Name (*) 手卷

Meal(s) Using this Category:

Figure 19. Before deleting a category.



Delete	Name	Category	Unit Price	Qty	Subtotal
X	烤鯖魚押壽司	壽司	120	1	120 NTD
X	特選長鰭鮪魚	壽司	80	1	80 NTD
X	烤鯖魚押壽司	壽司	40	2	80 NTD
X	炙烤鮪魚腹鱒	壽司	80	1	80 NTD
X	焦糖法式金磚	Dessert	90	1	90 NTD

Figure 20. After deleting a category.

[5 pts] MVC and Presentation Model

Ideally, the view should be as thin as possible. Business logics should reside in the model. However, there are times that the view also needs view-dependent logics (e.g., enabling/disabling buttons). In that case you should put these logics into **Presentation Model** to prevent from having the **fat view** bad smell.

[1 pts] Changing Getter and Setter Method to Property

You should change all getter and setter methods to **property** in your program.

[2 pts] UI Control

Controls should be properly enabled/disabled depending on the state of the program.

[8 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.

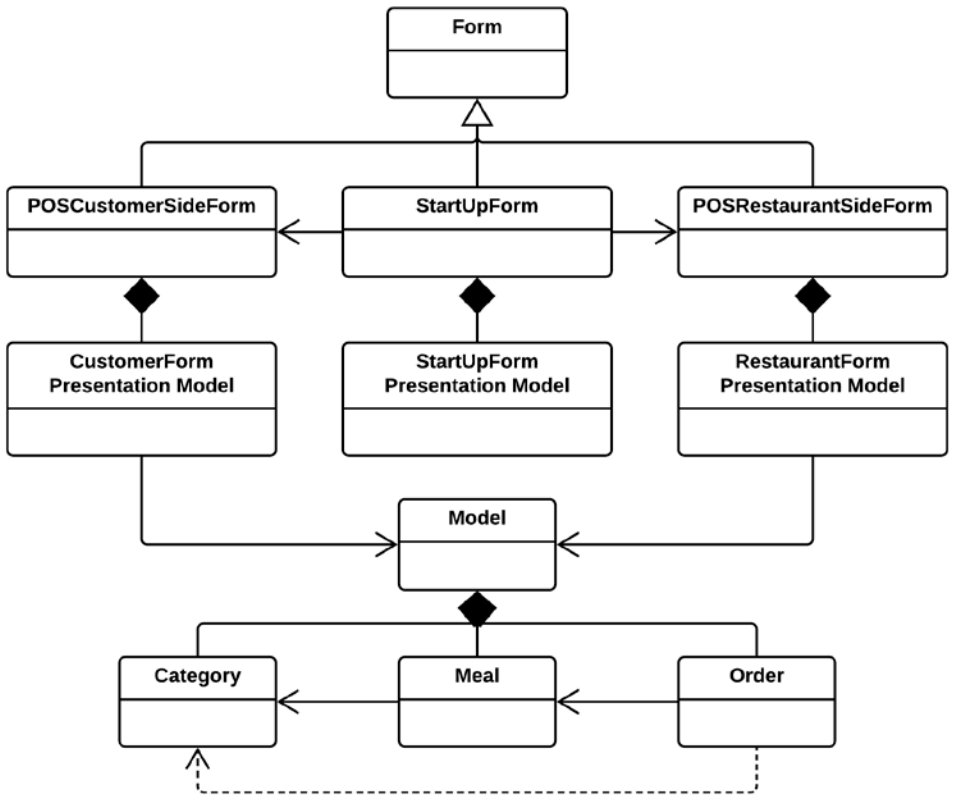

Form
POSCustomerSideForm
StartUpForm
POSRestaurantSideForm
CustomerForm Presentation Model
StartUpForm Presentation Model
RestaurantForm Presentation Model
Model
Category
Meal
Order

Figure 21. A reference class diagram

Additional Information

The following information is useful for your homework. If you need more details, please look at the textbook or MSDN website.

1. How to add a customized DataGridViewNumericUpDownColumn to DataGridView:

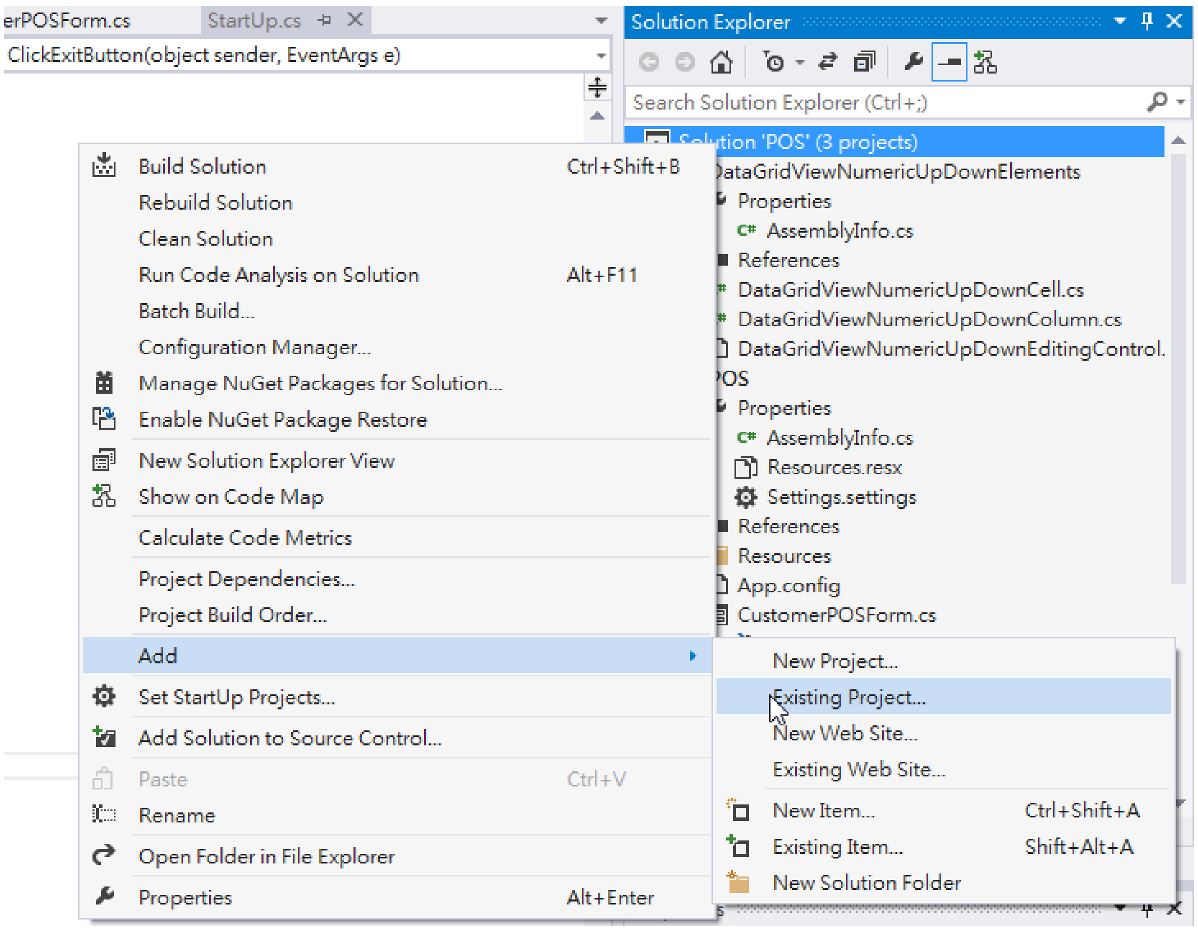
   Step 1. Download the given Zip file:

   https://drive.google.com/open?id=1L-UatBcEWXm5lHNEQWHm-xydcik_bO3W

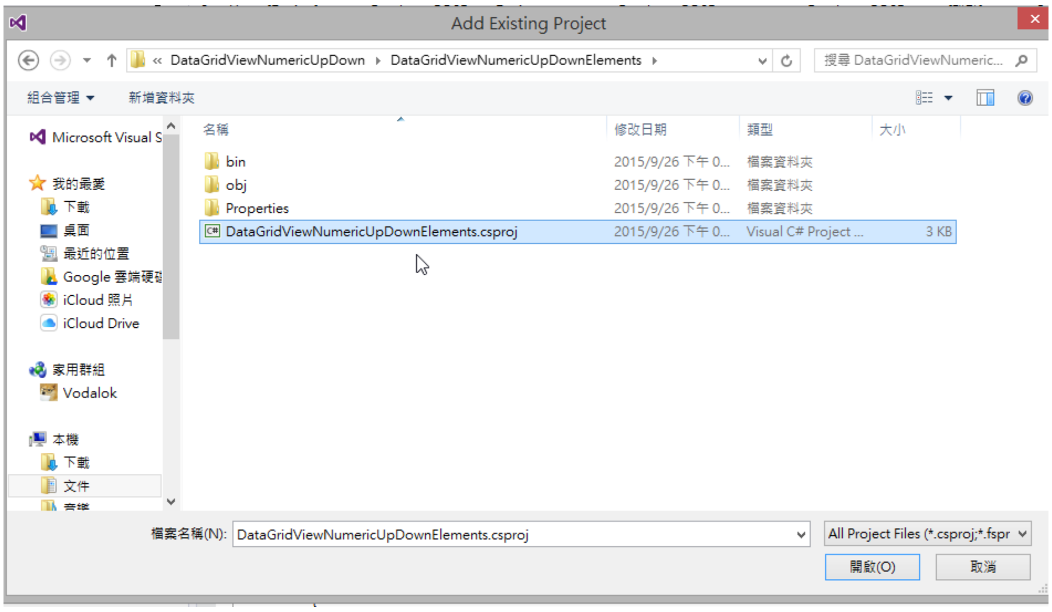
   Step 2. Unzip into your solution directory.

   Step 3. Open your solution.

   Step 4. In solution explorer, right-click on the Solution '(Your solution name)' then click Add -> Existing Project



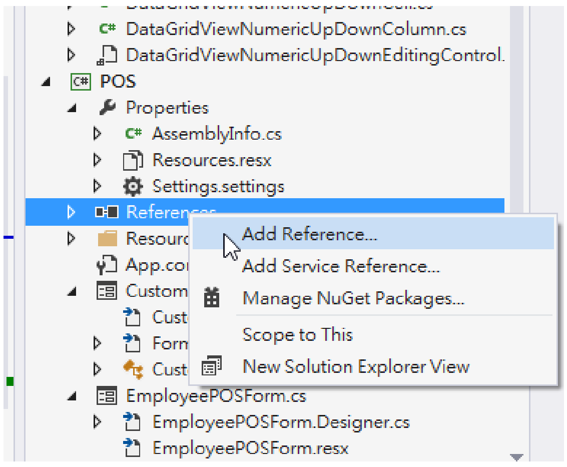
Step 5. Go to the folder where you unzipped the zip file, you will see a project named 'DataGridViewNumericUpDownElement.csproj', open it.

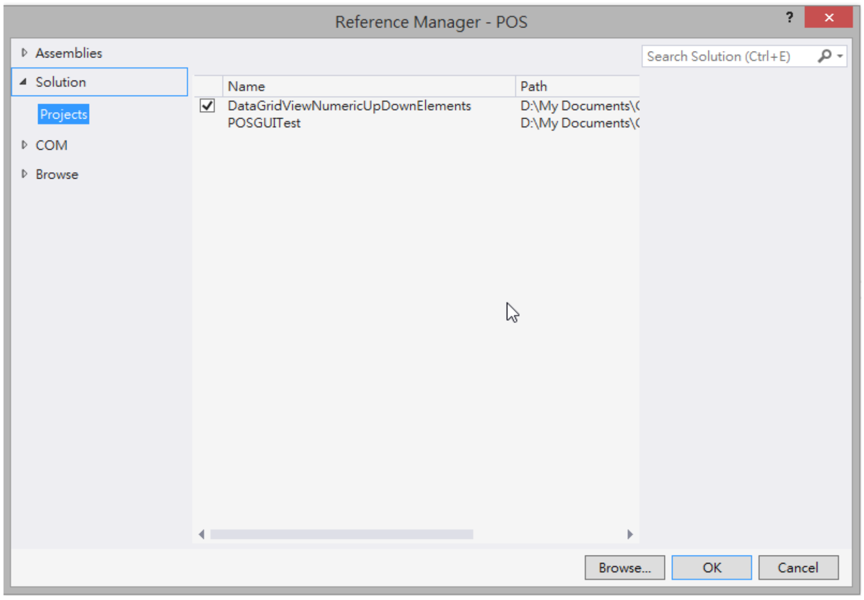


名稱	修改日期	類型	大小
bin	2015/9/26 下午 0...	檔案資料夾	
obj	2015/9/26 下午 0...	檔案資料夾	
Properties	2015/9/26 下午 0...	檔案資料夾	
DataGridViewNumericUpDownElements.csproj	2015/9/26 下午 0...	Visual C# Project ...	3 KB

檔案名稱(N): DataGridViewNumericUpDownElements.csproj

Step 6. Add DataGridViewNumericUpDownElement reference to your homework project.



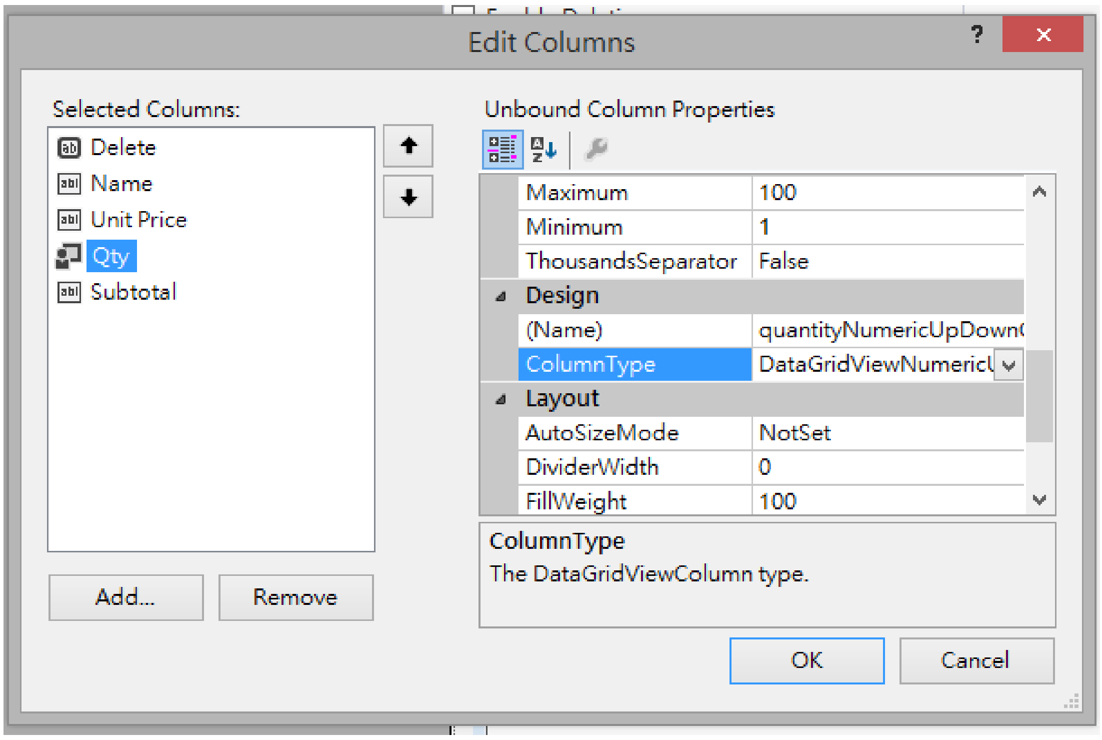


Name	Path
✓ DataGridViewNumericUpDownElements	D:\My Documents\(
POSGUITest	D:\My Documents\(

Step 7. Now you can use DataGridViewNumericUpDownColumn in your homework project.

```
using DataGridViewNumericUpDownElements;

Private DataGridViewNumericUpDownColumn _quantityNumericUpDownColumn;

…

this.dataGridViewNumericUpDownColumn1 = newDataGridViewNumericUpDownColumn();

this._quantityNumericUpDownColumn.HeaderText = "Qty";

this._quantityNumericUpDownColumn.Minimum = 1;

this._quantityNumericUpDownColumn.Name = " _quantityNumericUpDownColumn ";

this._orderDataGridView.Columns.Add(_quantityNumericUpDownColumn);
```

Or


Edit Columns

Selected Columns:
- Delete
- Name
- Unit Price
- Qty
- Subtotal

Unbound Column Properties

Maximum	100
Minimum	1
ThousandsSeparator	False
Design	
(Name)	quantityNumericUpDown(
ColumnType	DataGridViewNumericU
Layout	
AutoSizeMode	NotSet
DividerWidth	0
FillWeight	100

ColumnType
The DataGridViewColumn type.

Learn more about DataGridViewNumericUpDown column and cell, please visit MSDN: https://msdn.microsoft.com/en-us/library/aa730881(v=vs.80).aspx

2. Tab Control

The following code creates a **TabControl** and add some **TabPage** to it.

```
_catgegoryTabControl = new System.Windows.Forms.TabControl();
this._ sushiTabPage= new System.Windows.Forms.TabPage();
this._catgegoryTabControl.Controls.Add(this._sushiTabPage);
this._dessertTabPage = new System.Windows.Forms.TabPage();
this._catgegoryTabControl.Controls.Add(this._dessertTabPage);
this._drinkTabPage = new System.Windows.Forms.TabPage();
this._catgegoryTabControl.Controls.Add(this._drinkTabPage);
this._catgegoryTabControl.Name = "_catgegoryTabControl";
```

The following code removes a **TabPage** from a **TabControl**.

```
this._catgegoryTabControl.TabPages.Remove(this._ sushiTabPage);
```

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

3. List Box

   The following code creates a **ListBox** and add some items to it.

```
this._mealListBox = new System.Windows.Forms.ListBox();
this._mealListBox.FormattingEnabled = true;
this._mealListBox.Items.AddRange(new object[] {
                "Tonkatsu Burger",
                "Double Quater Pounder w/ Cheese",
                "Bacon & Beef Burger",
                "French Fries(S)",
                "Apple Pie",
                "McFlurry(Tiramisu)",
                "McFlurry(OREO)",
                "Lemon Tea(S)",
                "Ice Green Tea(S)"});
this._mealListBox.Name = "_mealListBox";
```

   The following code removes an item from the **ListBox**.

```
this._mealListBox.Items.Remove("Tonkatsu Burger");
```

   The following code clears selection.

```
this._mealListBox.ClearSelected();
```

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

4. ComboBox

   The following code creates a **ComboBox** and add some item to it.

```
this._categoryComboBox = new System.Windows.Forms.ComboBox();
this._categoryComboBox.DropDownStyle = System.Windows.Forms.ComboBoxStyle.DropDownList;
this._categoryComboBox.FormattingEnabled = true;
this._categoryComboBox.Items.AddRange(new object[] {
                "Sushi",
                "Desserts"});
this._categoryComboBox.Name = "_categoryComboBox";
```

   The following code removes an item from **ComboBox**.

```
this._categoryComboBox.Items.Remove("Sushi");
```

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

5. Enable Multi-line mode of a **TextBox**

   The following code enables multi-line mode of a **TextBox**.

```
this._mealNameTextBox.Multiline = true;
```

   For more information, please visit MSDN :
   https://msdn.microsoft.com/zh-tw/library/12w624ff(v=vs.110).aspx

6. Open File Dialogue

   The following code opens an **OpenFileDialog,** sets an image format filter, and sets the initial directory to project directory.

```
this._openImageDialog = new System.Windows.Forms.OpenFileDialog();
string projectPath =
Path.GetDirectoryName(Path.GetDirectoryName(System.IO.Directory.GetCurrentDirectory()));
_openImageDialog.InitialDirectory = projectPath;
_openImageDialog.Multiselect = false;
_openImageDialog.Filter = "Image|*.png;*.jpg;*.jpeg";
DialogResult result = _openImageDialog.ShowDialog();
if (result == DialogResult.OK)
{
    //Open a file successfully
}
else
{
    //Cancel or failed
}
```

   The following code retrieves the file name which the OpenFileDialog just opened.

```
string absoluteFilePath = _openImageDialog.FileName;
//Code converts absolute path to relative path...
//...
```

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