

## Lab#3 – Asynchronous Programming & Parallel Programming & WPF

**Due Date:** Midnight of week8's Friday

**Purpose:** The purpose of this assignment is to help you become familiar with

- Asynchronous programming & Parallel programming
- WPF applications

**Instructions:** Be sure to read the following general instructions carefully:

This assignment must be completed individually. You are encouraged to demonstrate your solution during lab session, and submit your solution **through the dropbox**. You must name your submission according to the following rule:

**studentID(yourlastname)\_Labnumber.zip.** e.g., 300123456(smith)\_LAB#3.zip

### Rubric

<u>Functionality</u>	<u>Marks</u>
<b>Question 1</b>	
Parallel.Invoke	1+1+2
Functionality	1
<b>Question 2</b>	
WPF GUI (XAML)	2
Data Binding + ObservableCollection<T>	1+1
Functionality <ol style="list-style-type: none"> <li>1. The selected item(s) from combobox is added to the DataGrid row; if the selected item(s) exists in the DataGrid, change the quantity of the corresponding items rather than add new row</li> <li>2. The selected item can be removed from the DataGrid</li> <li>3. The quantity can be updated directly in DataGrid</li> <li>4. The invoice is generated correctly</li> </ol>	3+2+2+2
Overall (code quality, usability etc.)	2

### Question 1 [5 marks]

You are asked to use *Parallel* class to modify *FlickrViewer* app, which you can download from course shell under week6, by adding generating thumbnail for selected image(s). More specifically, after user selects one image from ImageListBox, the app will download the image from Flickr, then your app needs to display the downloaded image on the PictureBox and generate thumbnail for the selected image, then save the thumbnail locally (i.e., on your own computer). These two tasks need to perform parallelly.

The code snippet below is to give you some hints on how to generate thumbnail and save it locally.

```

public void GenerateThumbnail(byte[] imageBytes, string thumbnailFileName)
{
    int imageHeight = 100;
    int imageWidth = 100;

    Image fullSizeImg = Image.FromStream(new MemoryStream(imageBytes));
    Image.GetThumbnailImageAbort dummyCallBack = new Image.GetThumbnailImageAbort(ThumbnailCallback);
    Image thumbNailImage = fullSizeImg.GetThumbnailImage(imageWidth, imageHeight, dummyCallBack, IntPtr.Zero);
    thumbNailImage.Save(thumbnailFileName, ImageFormat.Jpeg);
    thumbNailImage.Dispose();
    fullSizeImg.Dispose();
}

2 references
public bool ThumbnailCallback()
{
    return false;
}

```

## Question 2 [13 marks]

(Restaurant Bill Calculator) A restaurant wants a **WPF app** that calculates a table's bill. The app should display all following menu items (shown below) in four ComboBoxes. Each ComboBox should contain a category of food offered by the restaurant (Beverage, Appetizer, Main Course and Dessert).

Your application should have following functionalities

- 1) Users can choose an item from any comboBox, the selected item should be added to the DataGrid, and the bill should be updated correspondingly
  - a. If the selected item(s) has not existed the DataGrid, then your app should add a new row in the DataGrid
  - b. Otherwise, your app changes the quantity of the corresponding items rather than add a new row
- 2) Users can remove the selected item(s) from the DataGrid, and the bill should be updated as well
- 3) Users can update the quantity for a particular item in the DataGrid, and the bill should be updated correspondingly
- 4) After users click the **Clear Bill** Button, your app should clear DataGrid, and restore the SubTotal:, Tax: and Total: fields to \$0.00.

Name	Category	Price	Name	Category	Price
Soda	Beverage	\$1.95	Chicken Alfredo	Main Course	\$13.95
Tea	Beverage	\$1.50	Chicken Picatta	Main Course	\$13.95
Coffee	Beverage	\$1.25	Turkey Club	Main Course	\$11.95
Mineral Water	Beverage	\$2.95	Lobster Pie	Main Course	\$19.95
Juice	Beverage	\$2.50	Prime Rib	Main Course	\$20.95
Milk	Beverage	\$1.50	Shrimp Scampi	Main Course	\$18.95
Buffalo Wings	Appetizer	\$5.95	Turkey Dinner	Main Course	\$13.95
Buffalo Fingers	Appetizer	\$6.95	Stuffed Chicken	Main Course	\$14.95
Potato Skins	Appetizer	\$8.95	Apple Pie	Dessert	\$5.95
Nachos	Appetizer	\$8.95	Sundae	Dessert	\$3.95
Mushroom Caps	Appetizer	\$10.95	Carrot Cake	Dessert	\$5.95
Shrimp Cocktail	Appetizer	\$12.95	Mud Pie	Dessert	\$4.95
Chips and Salsa	Appetizer	\$6.95	Apple Crisp	Dessert	\$5.95
Seafood Alfredo	Main Course	\$15.95			