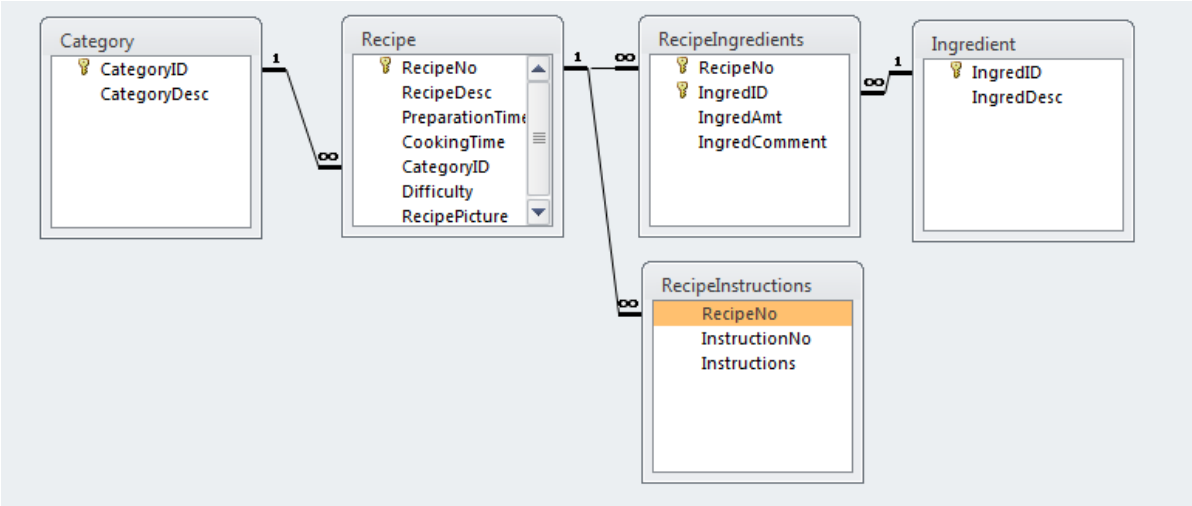
ONT2000 Semester 1 Test 3

Date: 9th June, 2013
Venue:
Engineering Building 276 Time:
14:00
Marks: 100
Time: 3 hours

Question 1 [62]

ABC Cooking requires a Recipe System that will allow users to add/change/display recipes, ingredients etc.

The system uses the Recipes.accdb database. The ERD for the database is:



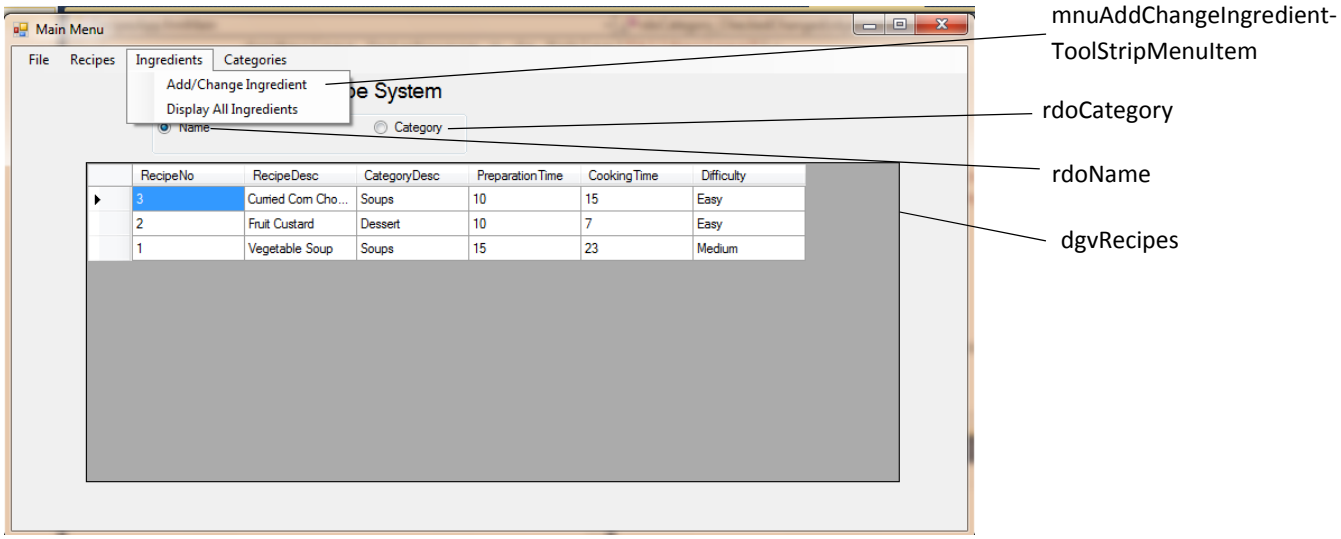
The definitions of the fields are as follows:

Field Name	Type	Description
CategoryID	String	Category ID
CategoryDesc	String	Category Description
RecipeNo	Integer	Recipe No
RecipeDesc	String	Recipe Description
PreparationTime	Integer	Preparation time in minutes
CookingTime	Integer	Cooking Time in minutes
Difficulty	String	Difficulty of the recipe
IngredID	String	Ingredient ID
IngredDesc	String	Ingredient Description
IngredAmt	String	Quantity of ingredient
IngredComment	String	Comment for ingredient
InstructionNo	Integer	Instruction Step number
Instructions	String	Instructions for step of recipe

Program Operation

frmMain

The first form, frmMain, of the system displays all the recipes and the menu options.



This form displays all the recipes in the Recipe System. The user has the choice of the sequence of the list. If the user wants an alphabetical list of recipes then the user will click on the Name radio button. This will then display the recipes in ascending sequence of Recipe Description.

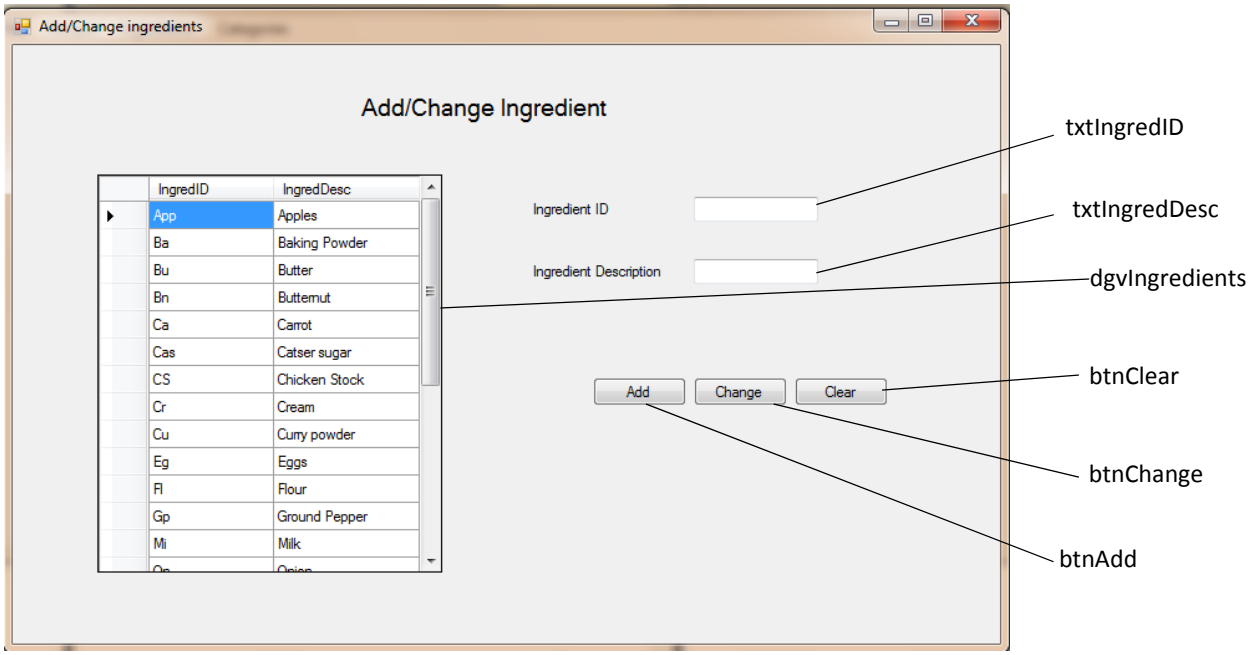
If the user wants the recipes in Category sequence then the user will click on rdoCategory.

Note: the Category Description is displayed and not Category ID in each row in the grid.

This form has a menu which allows the user to select menu options that enable him to go to another form.

frmIngredients

To enable a user to add and change ingredients, the following form is displayed:



All the ingredients from the Ingredient table are loaded into the grid, dgvIngredients before the form is displayed.

A user can add a new ingredient by typing in a new ingredient ID and Ingredient Description and pressing the Add button.

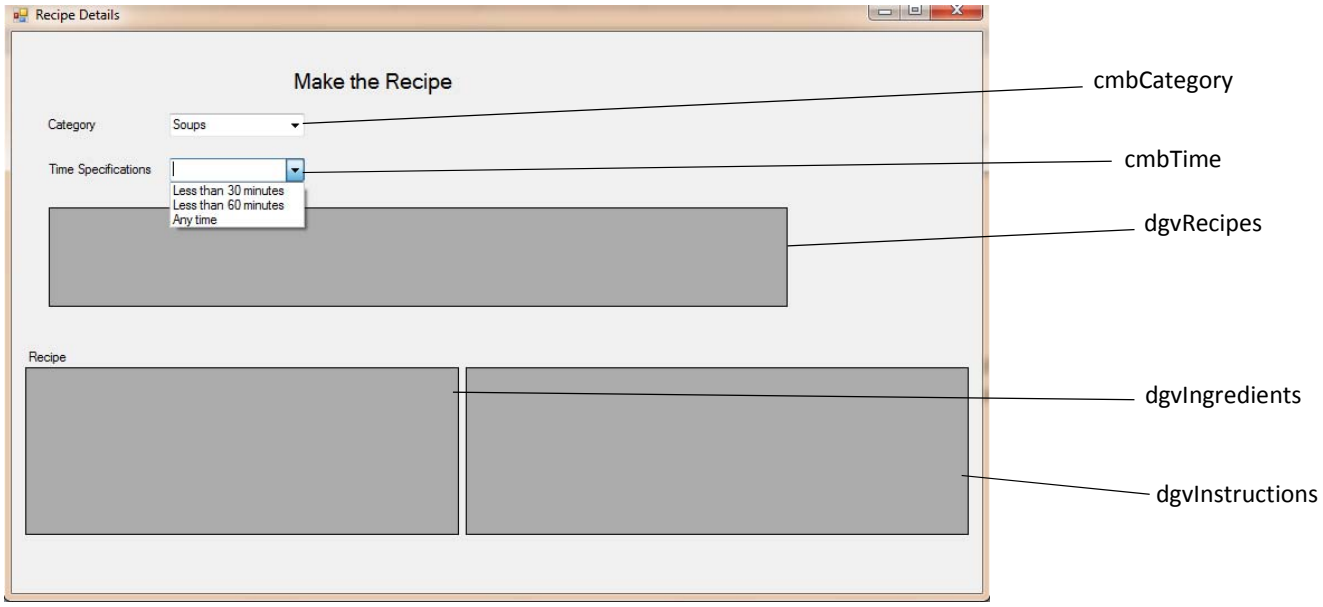
If the user wants to change an ingredient description, they must select the row in the grid, this will then load the ingredient data into the text fields. The user can then change only the description and then press the Change button.

A user can also clear the text fields.

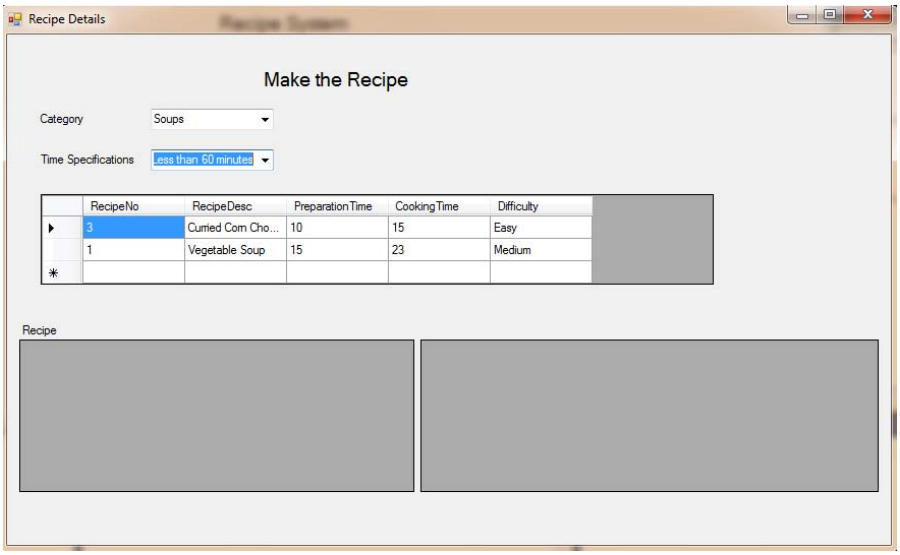
frmRecipeDetails

To display a recipe, a user can select a category and the time specification (the time to prepare and cook the recipe must not exceed the chosen amount of time). If the user is not concerned about the time, they must select the any time option and then all the recipes in the selected category will be displayed in the grid, dgvRecipes.

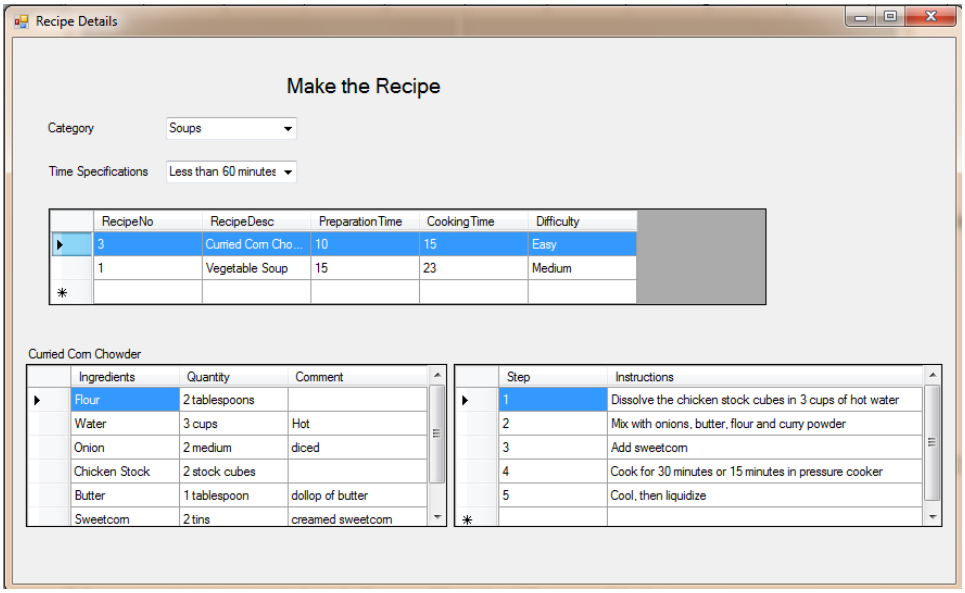
If the user selects one of the time limit specifications then the dgvRecipe will then display only the recipes in the selected category and whose preparation + cooking times are less than the specified time in the combobox, cmbTime.



The recipes in the selected category and time limit are displayed in Recipe Description sequence in the grid, dgvRecipes.



When the user selects a recipe from the grid, dgvRecipe, the ingredients for the recipe are loaded into the grid, dgvIngredients and the instructions for the recipe are displayed in the grid, dgvInstructions.



Required by you

The database connection and dataset are passed as parameters to the forms. You are required to write the following methods, you must cater for exceptions in your answers:

On frmMain

In the frmMain() constructor, the connection is created.

```
dbConn = new OleDbConnection("Provider=Microsoft.ACE.OLEDB.12.0;
Data Source=Recipes.accdb");
dbConn.Open();
```

1.1 `private void frmMain_Load(…)`

In this method all the recipes in the Recipe table are loaded into the grid, dgvRecipes. Recipes will be in Recipe Description order as the radio button, rdoName, is checked as default.

(6)

1.2 `private void rdoCategory_CheckedChanged(…)`
In this method all the recipes in the Recipe table are loaded into the grid, dgvRecipes. Recipes will be in Category order as the radio button, rdoCategory, is checked.

(5)

1.3 `private void rdoName_CheckedChanged(…)`
In this method all the recipes in the Recipe table are loaded into the grid, dgvRecipes. Recipes will be in Recipe Description order as the radio button, rdoName, is checked.

(2)

1.4 `private void mnuAddChangeIngredientToolStripMenuItem_Click(…)`
In this method the frmIngredients form must be displayed. The connection and dataset are passed as parameters into the constructor for frmIngredients.

(2)

frmIngredients

The connection is passed as a parameter into the class. So you do not need to define the connection.

1.5 `public frmIngredients(OleDbConnection dbConn, DataSet ds)`
You must code the constructor for the frmIngredients class.

(2)

1.6 `private void frmIngredients_Load(…)`
In this method you must load the grid, dgvIngredients, with all the ingredients in the Ingredients table in Ingredient Description sequence.

(4)

1.7 `private void dgvIngredients_CellContentClick(…)`
When the user selects an ingredient from the grid, dgvIngredients, the details of the ingredient are displayed in the textboxes on frmIngredients. You must also disable the Ingredient ID so that the user cannot update it.

(4)

1.8 `private void btnChange_Click(…)`
When you press the button, btnChange, the ingredient record must be updated on the Ingredients table with the data in the textboxes. The grid, dgvIngredients must also be updated with the change.

(7)

1.9 `private void btnAdd_Click(…)`
When you press the button, btnAdd, the ingredient record must be added to the Ingredients table using the data in the textboxes. The grid, dgvIngredients must also be updated with the new ingredient.

(7)

frmRecipeDetails

The connection is passed as a parameter into the class. So you do not need to define the connection.

1.10 `private void frmRecipeDetails_Load(…)`
In this method you must load the combobox, cmbCategory, with all the categories in the Category table in Category Description sequence. You must display the Category Description in the combobox. When the category is selected, the Category ID must also be available.

(5)

1.11 `private void cmbTime_SelectedIndexChanged(…)`
In this method you must display all the recipes, that are in the selected category and have a total time (preparation and cooking time) of less than the selected time from the cbmTime combobox, in the grid, dgvRecipes. If the user selects Any Time then all the recipes in the selected category must be displayed in dgvRecipes.

(8)

1.12 `private void dgvRecipes_RowEnter(…)`
In this method, the ingredients and instructions for the selected recipe must be displayed in the grid, dgvRecipes.

The selected recipe's ingredients must be read from the RecipeIngredients and Ingredients table so that it can be displayed in the dgvIngredients grid.

The selected recipe's instructions must be read from the Instructions table so that it can be displayed in the dgvInstructions grid.

(10)

Question 2 [20]

This question relates to Inheritance.

The base class is the PointType class. This is the class for a point in a XY plane.

```
public class PointType
    {
        protected double xcoord;
        protected double ycoord;

        public PointType(double xcoord, double ycoord)
        {
            this.xcoord = xcoord;
            this.ycoord = ycoord;
        }

        public double Xcoord
        {
            get
            { return xcoord; }
            set
            { xcoord = value; }
        }
        public double Ycoord
        {
            get
            { return ycoord; }
            set
            { ycoord = value; }
        }
        public override string ToString()
        {
            return "X-coordinate: " + xcoord + "\tY-coordinate: " + ycoord;
        }

    }
```

2.1 You are required to create a child class CircleType that inherits from PointType. CircleType has a starting point (x,y) and a radius which is a double field.

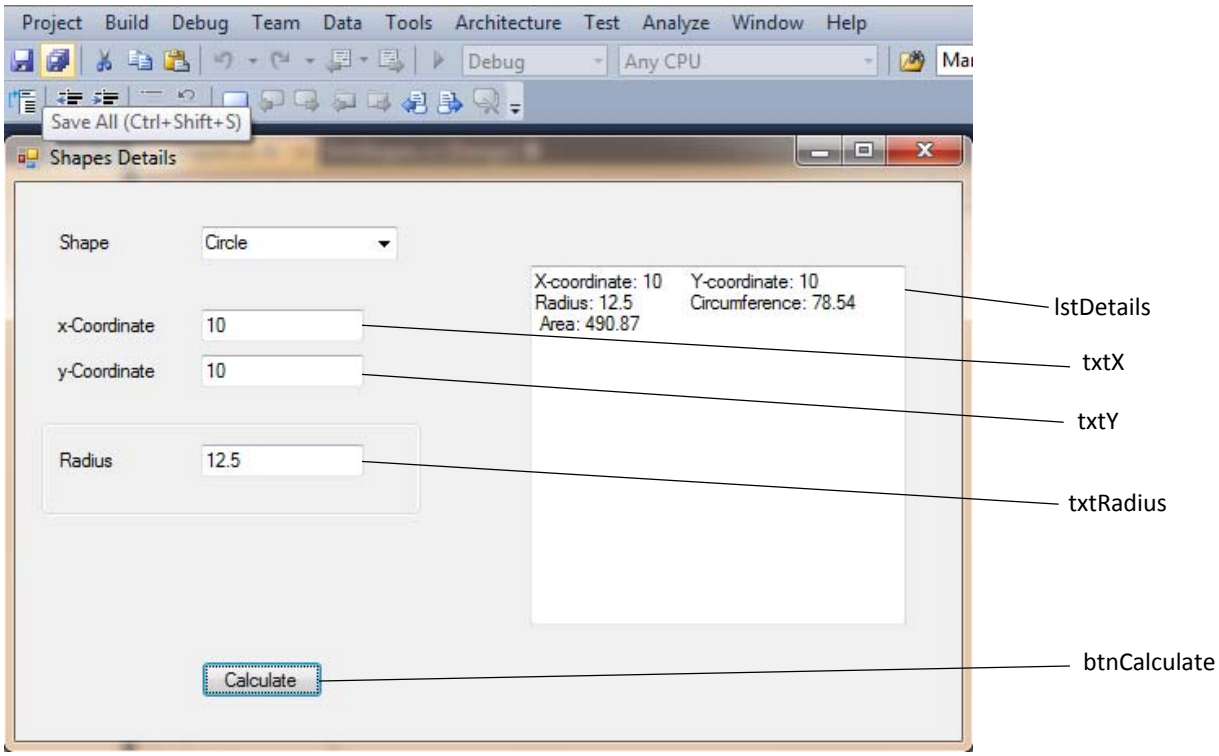
You must code the CircleType class. The class must have the attributes, properties, a method to calculate the area of the circle, a method to calculate the circumference of the circle and a ToString() method that will display the x and y values as well as the radius, the circumference and the area of the circle.

Circumference of circle = 2 * pi (3.14) * radius
Area of circle = pi (3.14) * radius^2

(10)

2.2 The following is a form that will prompt for the details of the circle and then display them in the listbox, lstDetails. You must code the btnCalculate_Click(…) that will display all the details of the circle whose x, y and radius values that were input on the form.

frmCircle



(10)

Question 3 [18]

3.1 Draw a diagram that shows the OleDb classes and how they interact with each other.

(8)

3.2 Discuss the concept of a dll and the benefits of using them. Use Question 2 to illustrate how you would use dll's in your solution.

(10)