

# Lab 05

# Rental Housing

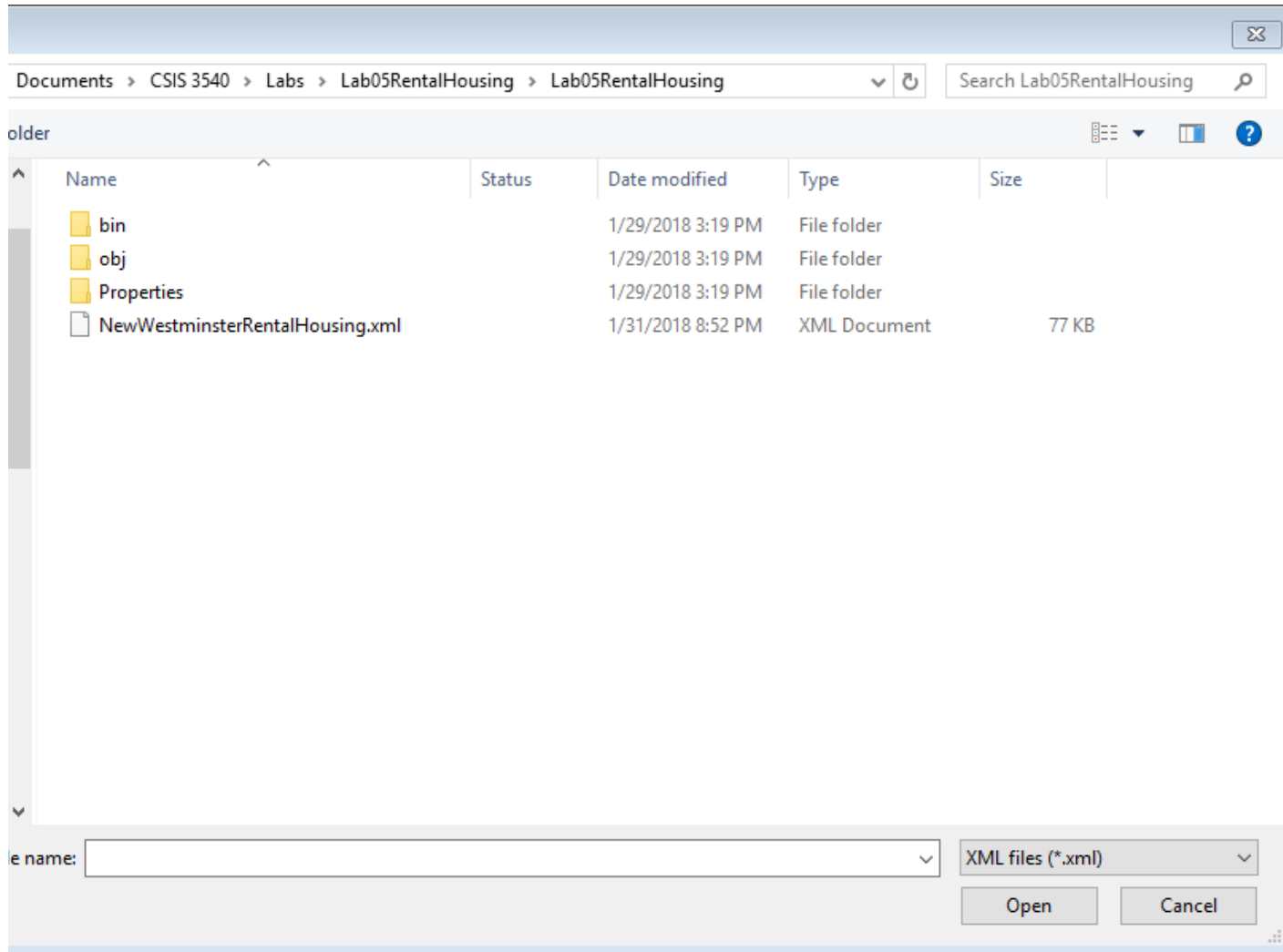
Using LINQ and Windows Forms

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# Rental Housing Application

- Unpack Visual Studio Project
  - Download Lab05RentalHousing.zip and unpack it to your project directory.
    - This contains the xml data file as well
  - Name: Lab05RentalHousing
  - Windows Forms Application
  - **Start up the project by clicking on Lab05RentalHousing.sln in the solution folder.**
- Description
  - The City of New Westminster provides data on rental housing in XML format. This data is in the file **NewWestminsterRentalHousing.xml** in the project folder.
  - The application reads the data from the xml file, and displays the data in a DataGridView control.
  - The application can filter based on neighborhood or building name, and displays the rental housing that matches.
  - The form and template code is already done.
- Project requirements
  - Controls have already been created in Designer. No need to change any of this.
  - Complete the code in Lab05RentalHousingForm.cs
- Application flow
  - Open the data file using OpenFileDialog
  - Deserialize the data and store the data in a List<NewWestminsterRentalHousing>
  - Fill the DataGridView control with List<NewWestminsterRentalHousing> data
  - All neighborhoods are displayed and selected in a ListBox.
  - Depending on the listBoxNeighborhoods selection and textBoxBuildingNameSearch, change the records displayed
    - Hint: use LINQ to query the main list.
  - Show the number of apartments and total number of residences.
  - The Reset button should clear the textbox and select all neighborhoods in the listbox.
- Show instructor your progress, and submit via Blackboard by the due date and time.

# Open the XML file



# Read in data from file and populate control

- Read in the file, storing each record in List<NewWestminsterRentalHousing>, and then add records/fields to the DataGridView control
- Records are ordered by neighborhood then building name.
- Show the number of apartments and total residences
- All neighborhoods in the listbox are selected, and the building name search is clear.

BuildingId	Address	BuildingName	NumberOfResidences	Neighborhood
3314	1031 THIRD AVE	4 SUITES	4	BROW OF THE HILL
3767	425 THIRTEENTH ST	4 SUITES	4	BROW OF THE HILL
3754	1321 CARIBOO ST	8 SUITES	8	BROW OF THE HILL
3307	1009 THIRD AVE	APARTMENTS	35	BROW OF THE HILL
4661	510 NINTH ST	BERWYN MANOR	36	BROW OF THE HILL
4664	517 TENTH ST	BIRCHWOOD MANOR	32	BROW OF THE HILL
4663	520 NINTH ST	BURTON MANOR	35	BROW OF THE HILL
3406	340 EIGHTH ST	CAMEO COURT	41	BROW OF THE HILL
3769	1211 CAMERON ST	CAMERON MANOR	41	BROW OF THE HILL
3719	1016 FIFTH AVE	CANTERBURY COURT	42	BROW OF THE HILL
4653	520 EIGHTH ST	CEDAR GROVE APARTMENT	56	BROW OF THE HILL
4746	502 THIRTEENTH ST	CERALDI APARTMENTS	10	BROW OF THE HILL

Number Of Apartments  Total Residences

Select Neighborhoods

- BROW OF THE HILL
- BRUNETTE CREEK
- CONNAUGHT HEIGHTS
- DOWNTOWN
- GLENBROOKE NORTH
- KELVIN
- NORTH ARM NORTH
- NORTH ARM SOUTH
- QUEENS PARK
- SAPPERTON
- UPTOWN
- VICTORY HEIGHTS
- WESTEND

Building Name Search

# Refine the item list by search

- Use LINQ to filter the data by selected neighborhood in the listbox and by building name (but only if the button is clicked).
- Reset button selects all neighborhoods and shows all records (as at program start)

The screenshot shows the 'New Westminster Rental Housing' application. It features a table with the following data:

BuildingId	Address	BuildingName	NumberOfResidences	Neighborhood
105	338 AGNES ST	ARABELLE APARTMENTS	11	DOWNTOWN
157	212 AGNES ST	BAINES PLAZA	16	DOWNTOWN
396	503 AGNES ST	BEL AIR APARTMENT	16	DOWNTOWN
189	313 CARNARVON ST	BRIDGEVIEW COURT	12	DOWNTOWN
433	52 ROYAL AVE	CANERO CASTILLO APARTME...	20	DOWNTOWN
203	215 CARNARVON ST	CARNARVON APARTMENT	17	DOWNTOWN
137	44 LEOPOLD PL	CLARK MANOR	11	DOWNTOWN
236	331 AGNES ST	COMERFORD APARTMENTS	16	DOWNTOWN
107	320 CARNARVON ST	CORONATION COURT	14	DOWNTOWN
108	320 CARNARVON ST	CORONATION COURT	14	DOWNTOWN
414	52 FOURTH ST	CROWN TOWERS	77	DOWNTOWN
250	125 AGNES ST	EARL'S COURT	17	DOWNTOWN

Below the table, the 'Number Of Apartments' is 48 and 'Total Residences' is 1,237. A 'Select Neighborhoods' listbox shows 'DOWNTOWN' selected. A 'Building Name Search' text box is empty, and a 'Reset' button is visible.

The screenshot shows the same application after a search for 'court'. The table now displays only the records where the building name contains 'court':

BuildingId	Address	BuildingName	NumberOfResidences	Neighborhood
189	313 CARNARVON ST	BRIDGEVIEW COURT	12	DOWNTOWN
107	320 CARNARVON ST	CORONATION COURT	14	DOWNTOWN
108	320 CARNARVON ST	CORONATION COURT	14	DOWNTOWN
250	125 AGNES ST	EARL'S COURT	17	DOWNTOWN
201	205 CARNARVON ST	EMERALD COURT	17	DOWNTOWN

The 'Number Of Apartments' is now 5 and 'Total Residences' is 74. The 'Building Name Search' text box contains the text 'court', and the 'Reset' button remains visible.

# Coding Tasks

- You must complete the coding tasks in order to make the application functional.
- Do each task carefully, one at a time, and test/debug thoroughly.
- Examine the xml file in the project carefully!

# Coding Tasks (also in code comments)

- InitializeDataGridViewRentalHousing()
  - Set up the column headers (names)
  - Test by compiling and running
    - you should see a blank form with the headers correct
- GetRentalHousingFromXML()
  - Open the xml file and set to StreamReader
  - Deserialize data from xml file and store in rentalHousingList.
  - Code a test method to populate the datagridview control (can be used later) from rentalHousingList
- InitializeAllOtherFormControls()
  - Query (LINQ) rentalHousingList to create a unique set of neighborhoods, and add this list of strings to listBoxNeighborhoods.
  - Neighborhoods should be converted to UPPERCASE
  - Test by running the program, it should show the listbox properly populated.
- ResetControlsToDefault()
  - Unregister/register event handlers
  - Clear the search textbox
  - Create the listBoxNeighborhoods.SelectedIndexChanged event method (hint: use += TAB)
  - Make sure all neighborhoods are **selected** in the listbox.
  - Test by running the program, all neighborhoods should be shaded blue (selected).
- DisplayRentalHousing()
  - Using a LINQ query, display all of the rental housing that matches the **selected** neighborhoods in the listbox.
  - Also, if the search button is clicked, display rental housing that matches the building name.
  - Display all rental housing records ordered by neighborhood then building name
- In the main form method
  - set the buttonBuildingNameSearch.Click event method and handler
  - set the buttonReset.Click event method and handler
- Test thoroughly and submit via Blackboard

# Rental Housing XML file

- Note the format of the file, and how it corresponds to the class definition of NewWestminsterRentalHousing

```
<ArrayOfNewWestminsterRentalHousing xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <NewWestminsterRentalHousing>
    <BuildingId>3768</BuildingId>
    <Address>1221 CAMERON ST</Address>
    <BuildingName>PINE CREST</BuildingName>
    <NumberOfResidences>10</NumberOfResidences>
    <Neighborhood>BROW OF THE HILL</Neighborhood>
  </NewWestminsterRentalHousing>
```