Assignment Tutorial Letter 2024

Advanced Programming

COS3711

Year module

Computer Science Department

Assignment 1 Questions

BARCODE

Assignment 1

1. Introduction

Please use CMake (and not qmake) when setting up your assignment projects.

Qt Designer should not be used to design user interfaces, and you are expected to manually set up GUIs to ensure that you properly handle memory using Qt's parent-child functionality.

Good programming practices should be followed.

Follow standard naming conventions: class names start with a capital letter, variable and function names start with a lowercase letter, using camelCase for names made up of multiple words.

Ensure consistent code layout and use of blank lines.

Use forward class declarations in header files.

Use initialiser lists in constructors.

Have proper GUI management: setting cursor focus, sequential tabbing, clearing input widgets (like text input fields being cleared and spin boxes being returned to some default value), and enabling and disabling buttons as appropriate.

Provide appropriate user feedback.

Your code should build and run without any warnings.

2. Questions

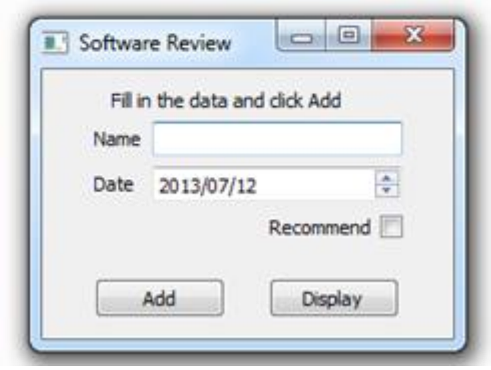
Question 1

Write classes (as necessary, remembering to avoid any anti-patterns) that will manage software review data. The data itself consists of

- the name of the software,
- the date of the review, and
- an indication of whether it is recommended or not.

You should create a graphical user interface that allows a user to enter the data. Data should be stored in an appropriate container (allowing for several reviews to be recorded), and be printed to a console window when required.

Test your code by adding at least 3 pieces of data. Below is an example of a possible interface.



Fill in the data and click Add

Date 2013/07/12

Question 2

Extend Question 1 so that it uses reflective programming techniques to access the data members of the object that holds the review data. Write another display function that does not use any public accessor functions (or a toString() function) to get access to the review data. Also add a button to display the review detail to the application window (so that the program now can print to the console or GUI window).
When displaying the data to the application window, you cannot assume that you know beforehand how many properties there are, what they are called, or of what type they are. You need to loop through the properties and using reflective programming techniques, display the data to the application window.

HINT: You will need to use QVariant.

Question 3

Use Qt's model/view framework to store and display music CD information. The following information should be stored in the model (a QStandardItemModel):

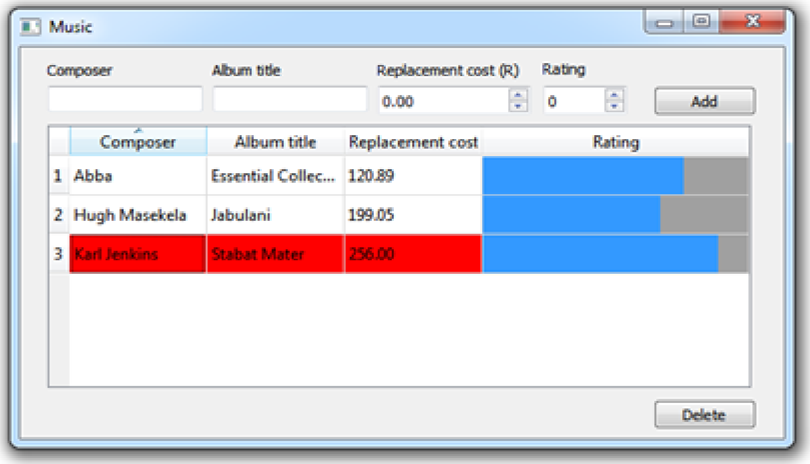
- composer,
- album name,
- replacement value, and
- a rating (out of 100).

The information should be displayed in a table.

The following functionality should be included.

- There should be a header row.
- The user should be able to add rows of data to the model.
- The replacement value should always display the cents (even as .00).
- Use a delegate to display the rating as a horizontal bar. This column should take up all the remaining space available.
- The user should be able to sort the data by clicking on the column header on which the sorting should be implemented.
- Where the replacement value is greater than or equal to R200, the row should be made a different colour. Note that this colour should also change if the user edits a replacement value (and it should return to the normal colour if the value drops below R200).
- The user should be able to delete a row of data.

Here is an example of the interface.



	Composer	Album title	Replacement cost	Rating
1	Abba	Essential Collec...	120.89	
2	Hugh Masekela	Jabulani	199.05	
3	Karl Jenkins	Stabat Mater	256.00	

Question 4

Write an application that uses regular expressions to check for telephone numbers and email addresses in a text file provided by a user. The following functionality should be included.

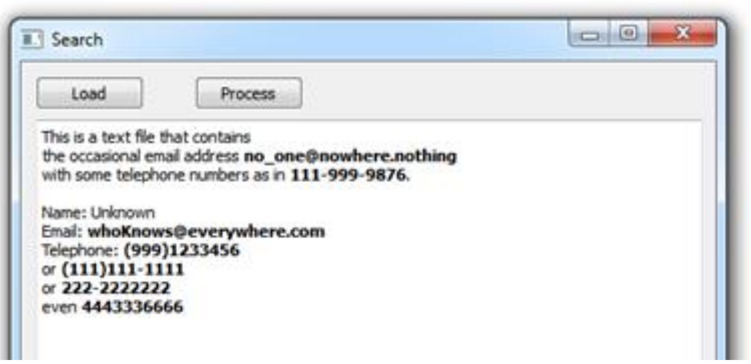
- The user should be able to select the file to check using a standard file open dialog box.
- The file should be displayed in the GUI.
- The telephone numbers and email addresses should be highlighted/emphasized in some way in the text.

An email address can be identified by a single @ symbol in the address; telephone numbers could be from any of the following formats:

- 000-000-0000
- 000-0000000
- 0000000000
- (000)000-0000
- (000)0000000

You may assume that the email addresses and telephone numbers are free standing, that is, they do not have brackets (or any other character) around them.

See an example below.



This is a text file that contains
the occasional email address **no_one@nowhere.nothing**
with some telephone numbers as in **111-999-9876.**

Name: Unknown
Email: **whoKnows@everywhere.com**
Telephone: **(999)1233456**
or **(111)111-1111**
or **222-2222222**
even **4443336666**

HINT: Consider using the QTextDocument, and QTextCursor classes.

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