UNIVERSITY OF THE WEST INDIES
CAVE HILL CAMPUS
Department of Computer Science, Mathematics & Physics

COMP2611 – Data Structures
Project #1
DEADLINE: **Sunday 02 March, 2023 at midnight**

OBJECTIVE: Implementation of the Linear Abstract Data Types.

The text file, "**Catalog.txt**", contains the **Billboard's Number 1 Songs** for the decade of the 1990s. The records in the file are structured as follows:

Month*Year*Artist(s)*Song's title*Record label*Weeks at number one
August*1990*Mariah Carey*Vision of Love*Columbia*4
August*1997*The Notorious B.I.G. featuring Puff Daddy & Mase*Mo Money Mo Problems*Arista*2
January*1999*Britney Spears*Baby One More Time*Jive*2

Where each field is separated by an asterisk (*). For example, the above examples would be:

Month	Year	Artist(s)	Song's title	Record label	Weeks at number one
August	1990	Mariah Carey	Vision of Love	Columbia	4
August	1997	The Notorious B.I.G. featuring Puff Daddy & Mase	Mo Money Mo Problems	Arista	2
January	1999	Britney Spears	Baby One More Time	Jive	2

Tasks:

1. Write the C++ code for the node class for the record, and store it in the header file "**Node.h**".

2. Using the "Node.h" header file, write the C++ code for the following Abstract Data Types and store the code in the corresponding header files:
   a. Queue   →   Queue.h
   b. Priority Queue →   PQueue.h
   c. Deque   →   Deque.h
   d. Stack   →   Stack.h

3. **Develop the frame for your GUI with the following main Menu:**

File	Queue	Deque	Priority Queue	Stack	Help

4. The GUI should be captioned: "**COMP2611 – Data Structures Project #1**". The Status bar should be divided into three (3) sections with the string **"Ready…"** in **Section 1,** *<Your Name Surname>* in **section 2** and your **ID Number** in **section 3.**
   e.g.

Ready…	Wiley Coyote	123456789

5. The main menu items/ADTs should have sub-menus as follows:

File	Queue	Deque	Priority Queue	Stack
Open File	Create Queue	Create Deque	Create PQ	Create Stack
Display File	Display All	Display All	Display All	Pop
Save	Show Head	Show Head	Show Head	Display All
Save As	Show Tail	Show Tail	Show Tail	Show Head
Exit	Dequeue	Dequeue Head	Dequeue	Show Tail
		Dequeue Tail		

You will be provided with a program called "**Skeleton01.cpp**" (whose name you will have to change) which already contains the functions for the **File menu item** as well as the code for creating the client area in your GUI. Use this file as a 'start-up' to add in the required remaining functionalities.

6. Using wxWidgets, your project Application will read data from the text file "**Catalog.txt**", which has been provided. However, **the file name should NOT be hard-coded into your program, but should be loaded from a fileOpen dialog**. The file is composed of asterisk-delimited fields for each record. Note the file also contains a heading line which must be "stepped-over" in order to get to the hit songs' records.

Use the records in the text file to populate the ADTs of your project as follows:

Queue	**All** records
Priority Queue	**All** records, sorted in **descending order** for the number of weeks the song remained at Number 1.
Stack	**All** records
Deque	**All** records. Insert records for 1990-1994 at the tail and 1995-1999 at the head.

The output results of all the menu functions should be displayed in the **main text box within your GUI**.

7. When the file is opened, its contents should be **immediately** displayed in that main textbox as well as when the menu option for **Display File** (in menu option **File**) is clicked.

8. Before each display operation is carried out, the display textbox should be cleared.

9. The operation indicated by the sub-menu item should then be carried out on that particular ADT **ONLY**. The other ADTs **should NOT** be affected by the operations on another ADT.

10. The **Exit** menu item is to close the program

11. The **About** menu item should produce a dialog box with suitable information about the programmer, the program, and the architecture of the machine the program is running on.

12. When the cursor is placed on a sub-menu option, a description of the menu option should be displayed in the first partition of the status bar. At all other times, the string, "**Ready…**" should be displayed.

SUBMIT:

Your project should contain a separate header file for each of the ADTs (i.e., Queue.h, PQueue.h Deque.h, Stack.h) as well as a source code file (**.cpp**) which contains your program. All the files should be submitted as a **ZIP** file with your ID number as the name (e.g. **123456789.zip**) through the portal on this course's page on eLearning. You may also use the portal to continually save your zipped project as a draft. Previous versions will be overwritten and only the latest version will be kept.

DEADLINE DUE DATE :   Sunday 02 March, - No Later Than MID-NIGHT.
No late assignments will be accepted – No extension will be granted!