**ICTPRG523 Apply advanced programming skills in another language**

AT1: Networked Math Quiz (C#) – complete and provide with your assignment submission

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1. Present an outline of your procedure in developing this project. The outline can be a broadly defined set of tasks which you have planned and completed. Your outline must show a breakdown of development, including testing and debugging.

1. Read SRS of this project.

2. Create the project named MathsQuiz and build GUI forms for Teacher app and Student app with using Visual Studio 2022.

3. Create Math Question class (MathQues) with using IComparable interface implemented. CompareTo() method which class contains 4 data elements: Left Operator(int leftOp), Right Operator(int rightOp), mathOperator(string mathOp), Answer(int answer). Create public properties for these : int LeftOp {get; set;}, int RightOp {get; set;}, int Answer {get; set;}, int MathOp {get; set;}.

4. Create basic networking with using provided chat code and test the connection (send/receive).

5. Declare data structures and MathQues object required for Teacher app.

* List<MathQues> mathList;
* LinkedList<MathQues> mathLinkedList;
* BinaryTree<MathQues> mathBinaryTree;
* Hashtable mathHashtable;
* MathQues currentMathQues;

6. Send math question to the student app from the teacher

* Create a IsMathQuesValid() method – Checks the content of the math ques operand texboxes.
* Calculate the answer
* Create an instance for the currentMathQues.
* Add instance to List<MathQues> object, Binary Tree<MathQues> object
* Send question string to Student app
* The math ques sent from Teacher app needs to be displayed properly on Student app and stored answer as a variable.

7. Set up response from Student app to Math Question

8. Set up ValidateAnswer() method to check the content of the answer textbox returns true or false if input is numeric or not.

9. Check the response from Student app against the answer sends “y” if they match and “n” if they don’t match.

10. Set up Teacher app to deal with “y” or “n” messages with using the SetText() method. If “n” is sent, add current question to Linked List.

11. Sorting

* Use List<MathQues> for sorting on Teacher app. Create the code for the 3 sorting algorithms.
* Bubble Sort (ascending order)
* Selection Sort (descending order)
* Insertion Sort (ascending order)
* Reassign sorted array to the List and display in the Data Grid View.

12. Display Linked List which contains the math question objects that are incorrectly answered.

13. Use HashSet or Binary Tree to search for a math question

14. Use Binary Tree for Pre-order, In-order and Post-order operations (Display, Save)

15. Testing

2. Provide a UML diagram of your Math Question class

Diagram

Description automatically generated

3. Provide details of how you have managed version control during the development of this project

// header comments

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\* Filename: Form1.cs

\* Purpose: Set up Teacher(Server) GUI

\* Author: Asami Paddison

\* Date: 20/05/2022

\* Version: 1.0

\* Licence: GNU

\* Note: Sort, LinkedList, Search(HashTable)

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// GitHub … brief description

To keep track of your work, helps you to easily search the changes you have made, coding scripts, notes and also to share among collaborators. Github provides you to store your files which you can have an online back up of your work.

Visual Studio supports Git version control system. You can use version control task directly from your project and code. Git provides you to keep track of your work, to easily search the changes you have made, coding scripts, notes. You can also share your project among collaborators by using Git remote repository server.

4. Ongoing communication

4 (a) Email between you (as the developer) and your manager BEFORE commencement of the project to secure the project specification

TO: Hans  
FROM: Asami  
SUBJECT: Maths Quiz project

MESSAGE:

I will implement a sorting algorithms which will be Bubble, Selection and Insertion Sort.

Could you send the SRS documentation for the Networked Maths Quiz application?

Thank you.

Kind regards,

Asami Paddison

*<This is a brief description of the project (list functionalities), and a request for the software requirements specification>*

4 (b) Email between you (as the developer) and your project manager regarding the proposed 3rd party library and licensing.

TO: Hans  
FROM: Asami  
SUBJECT:

MESSAGE:

Hi Hans,

I will implement Binary Tree for searching algorithm with using Third Party Library. This is very useful, save a lot of time and easier than writing by myself.

This is free to use with conditions under CC licence.

Thank you!

Kind regards,

Asami Paddison

*<If using the Binary Tree class source code --- indicate why it is used and the benefits --- also acknowledge the author and the free licensing (Attribution Creative Commons Licensing) free to use (to modify, for commercial provided that source code is properly attributed)*

*For more information re: Commons licensing refer:* [*https://creativecommons.org.au/learn/licences/*](https://creativecommons.org.au/learn/licences/)*>*

4 (c) Closing email between you (as the developer) and your manager regarding the success of the project development. You need to include areas of concern or risk to your manager for inclusion in the development of the team’s risk matrix.

TO: Hans  
FROM: Asami  
SUBJECT: Completion of Maths Quiz project

MESSAGE:

Hi Hans,

Math Quiz application has completed with all tests done. However there is security issue which the system of communication is not encrypted.

Thank you.

Kind regards,

Asami Paddison

*<Include Math Quiz successfully completing with all tests done to … also any improvements that you think would be useful and also a note about security issues!>*