SSN COLLEGE OF ENGINEERING
KALAVAKKAM-603110

Data Structure Mini Project

Dynamic Math Quiz

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1. **Title:** Dynamic Math Quiz

2. **Data Structured used:**
    - Linked List
    - Priority Queue

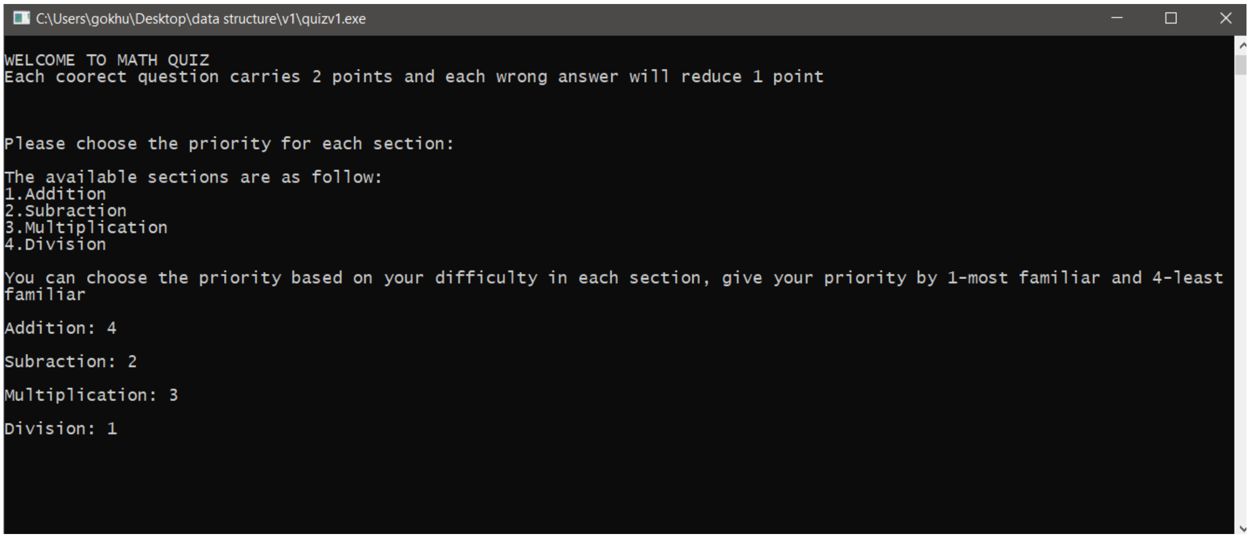
3. **Other Functionality used:**
    - Files
    - System Commands

4. **Description:**

    As the name states this Math Quiz is a Dynamic one which prioritises the question based on the user's knowledge on the specific section of question. In brief the user is asked to enter the well-known section as 1 and the least known section as 4, so the other section must be marked in the given range. The program automatically selects a higher number of questions from the well-known section and the least from the least known section. Now the program starts the quiz in a new fresh screen clearing all the previous details. The rules are pretty simple, the user gets 2 points for correct answer and a negative point for wrong answer. Finally, the program displays the score of the particular user.

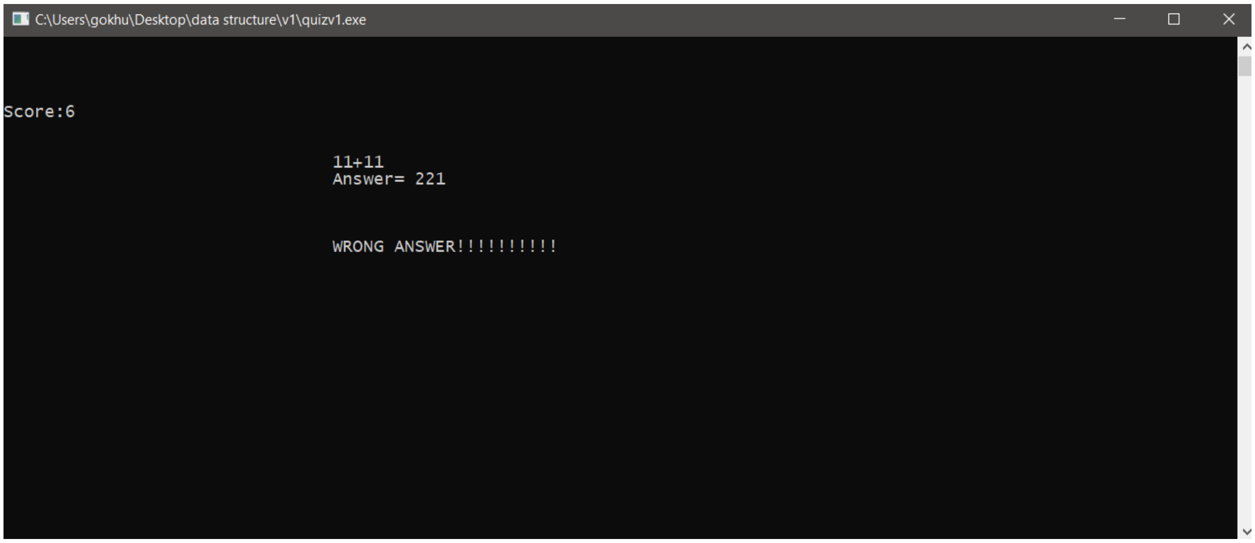
5. **Code Explanation:**

    The initial screen,



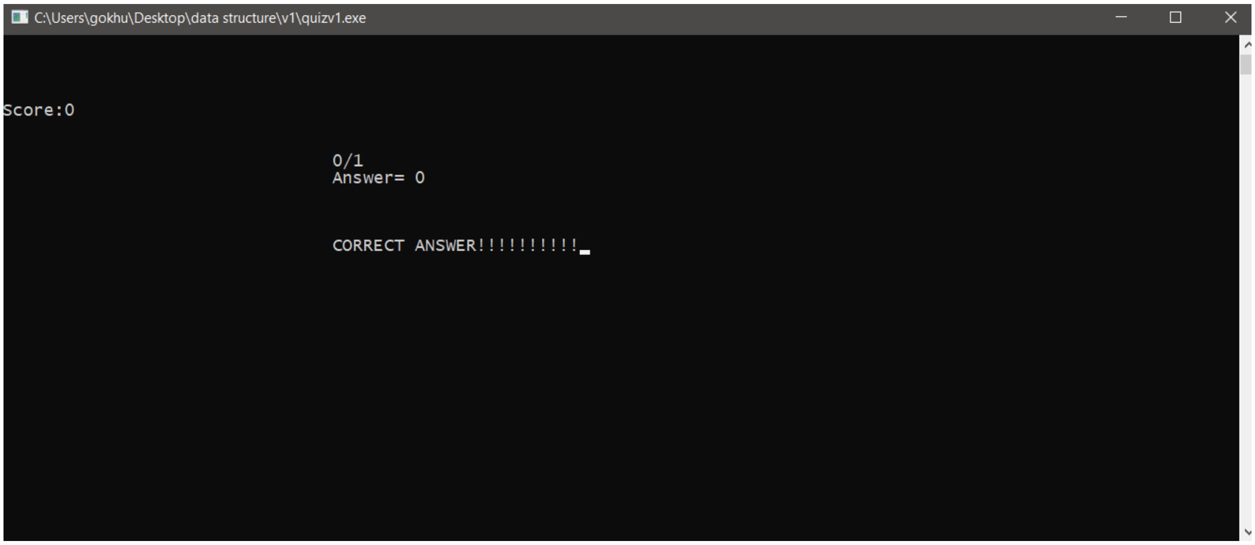
```
WELCOME TO MATH QUIZ
Each coorect question carries 2 points and each wrong answer will reduce 1 point


Please choose the priority for each section:

The available sections are as follow:
1.Addition
2.Subraction
3.Multiplication
4.Division

You can choose the priority based on your difficulty in each section, give your priority by 1-most familiar and 4-least
familiar

Addition: 4

Subraction: 2

Multiplication: 3

Division: 1
```

Here the rules and regulations are displayed. And it prompts to enter the difficulty level of each section. The concept of **Priority Queue** is used in here, as the user enters the priority the corresponding section and its priority is enqueued as data and key which then gets priorities. The top priority one gets 4 question added to the **Linked List** then the remaining as 3, 2, 1 question. So, this addition in to linked list happens immediately after the dequeue from the priority queue. Then the list is traversed and the questions are displayed.



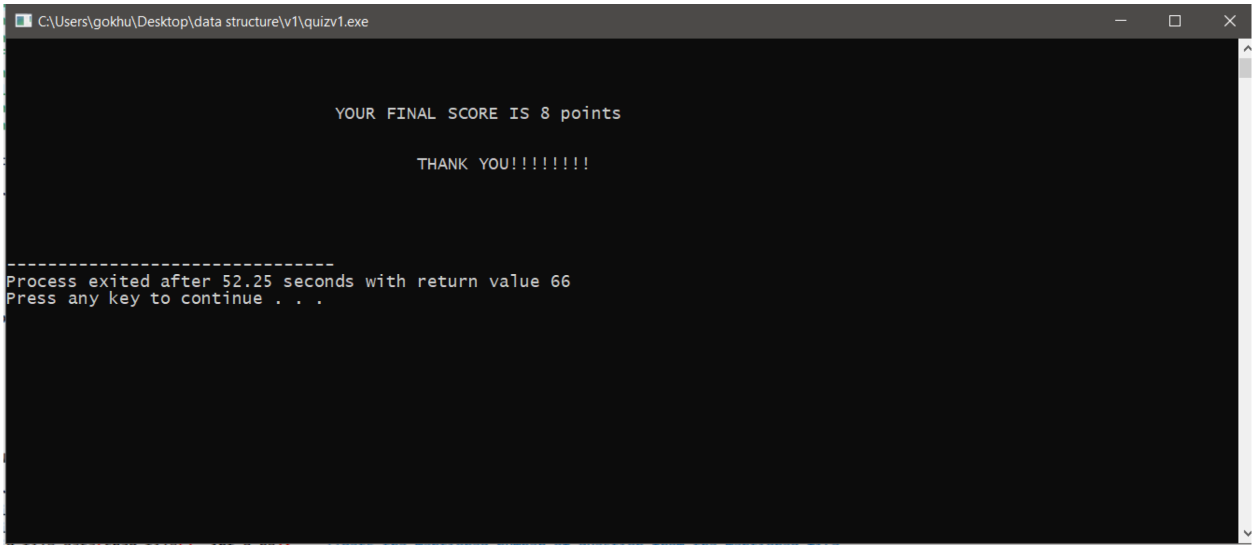
```
Score:6

                                11+11
                                Answer= 221


                                WRONG ANSWER!!!!!!!!!!
```

The score is updated simultaneously as the questions are updated. If the user gives a wrong answer then the score will be deducted by 1 point.



```
Score:0

                                0/1
                                Answer= 0


                                CORRECT ANSWER!!!!!!!!!!
```

If the user answer correctly 2 points will be added. So, after completion of 10 question the last page will display the final score.



```
                              YOUR FINAL SCORE IS 8 points

                                     THANK YOU!!!!!!!!



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Process exited after 52.25 seconds with return value 66
Press any key to continue . . .
```

6. Function Prototype:

- struct node_LL *start = NULL; **//Start of the linked list node**
- void insert(char q[],int a); **//inserts question and its answer to linked list**
- void traverse_question(); **//displays all the question and answer**
- void file_data(char file[], int q_no); **//gets the mentioned number of question from the mentioned file**
- Node_PQ* newNode_PQ(int d, int p); **//start node of the priority queue**
- int peek(Node_PQ** head); **//peek the top element**
- void pop(Node_PQ** head); **//pops the top element**
- void push(Node_PQ** head, int d, int p); **//push the element to the queue**
- int isEmpty(Node_PQ** head); **//checks whether the queue is empty**
- void checkAnswer(char q[],int a); **//checks the answer and updates the score;**

7. Additional Features:

- Each section has a separate text document that stores the list of questions. So we can append as much questions we can.
- We can change the total number of questions to display.
- We can add as many sections we can.
- Since the text file is read in a way that the question is considered as String and answer is considered as Integer which makes it easy to add word problem too.