|  |
| --- |
| Notes :   1. For p***roblem No. 1***, you could provide your answer ***either*** using ***hand-written*** and taking pictures of it or ***any word processing***. Subsequently, ***please combine all your solution in .pdf fil*e**. 2. For ***problem No. 2***, please ***submit your .cpp*** file. 3. The duration of this Quiz are ***180 minutes*** (***120 minutes*** duration to ***solve*** + ***60 minutes*** duration to ***submit***). 4. If you are ***late*** to submit, then your lecturer ***will not accept your submission***. 5. The quiz will be ***marked as 0***, if any ***plagiarism found***. |

1. **[40%]** Given the infix notation below :

Using the infix expression above:

1. **[15%]** Draw an expression tree
2. **[5%]** Based on the expression tree, write down the postfix expression
3. **[5%]** Based on the expression tree, write down the prefix expression
4. **[15%]** Simulate the conversion from infix to postfix expression using a stack. You must show the contents of the stack and the postfix string at each step of your working.

Table 1 Precedence level

|  |  |  |
| --- | --- | --- |
| **Operator** | **Precedence** | **Associativity** |
| ^ | 4 | left to right |
| \* | 3 | left to right |
| / | 3 | left to right |
| % | 3 | left to right |
| + | 2 | left to right |
| - | 2 | left to right |
| == | 1 | left to right |

1. **[60%]** Code

Singer and actor FT will embark on an international concert tour to celebrate 10 years as a recording artist. For registration, it will use a computer program to **register all tickets** **based on their arrival time**. They also can add their friend into queue if his/her friend already arrive at registration place. As a programmer you are asked to create a computer program as described above implementing **double linked list**.

* **Print all audience then print the menu consists of:**

1. **Register New Audience**
2. **Enter the Concert Hall**
3. **Search Queue Number**
4. **Update Audience Data**
5. **Exit**

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Figure 1. Main Menu

* **Menu 1: Register New Audience**

Staff can add new Audience to the list with **name** and **ticket id.**

* The **name** **length** of the new audience **must be between 2 and 20 characters**.
* The **ticket id** of the new audience **must 5-digit numbers (must be unique).**
* The program will ask “**Do you have a friend in the queue?**”.

If user input is “yes”, the program ask user to input friend’s ticket number.

**Otherwise**, **Add new data into queue**.

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Figure 2. Add New Audience Beside His/Her Friend

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Figure 3. After Add New Audience

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Figure 4. Add New Audience

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Figure 5. After Add New Audience

* **Menu 2: Enter the Concert Hall**

Staff can letthe audience to enter the concert hall via this menu.

* If there is **no data**, the application **will show a warning message** “**Data not found!**”.
* **Otherwise**, the application **will delete the first data**.

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Figure 6. Enter the concert hall

* **Menu 3: Search Queue Number**

Staff can **find** **audience** **queue** **number** from application via this menu

* If there is **no data**, the application **will show a warning message** “**There's no item to search, please insert new data**”.
* **Otherwise**, the application **will show Audience Queue Number.**

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Figure 7. Search Queue Number

* **Menu 4: Update Audience Data**

Staff can **Update Audience Name** from application via this menu

* If there is **no data**, the application **will show a warning message** “**There's no item to update, please insert new data**”.
* **Otherwise**, the application will ask you to input ticket id and new audience name.

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Figure 8. Update Audience Data

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Figure 9. After Update Audience Data

* **Menu 5: Exit**

Staff can **exit** from application via this menu

* Remove the remaining item existed in the memory (pop all)

-- Good Luck --