

QUIZ 1
COMP6048 – Data Structures Even 2019 / 2020
VAR 4

Notes :

1. For **problem 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 file**.
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 :

$$8 + 5 \times \frac{17 - 2}{(10 \times 3) - 15} - \frac{15}{3^2}$$

Using the infix expression above:

- a. **[15%]** Draw an expression tree
- b. **[5%]** Based on the expression tree, write down the postfix expression
- c. **[5%]** Based on the expression tree, write down the prefix expression
- d. **[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

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2. [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

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin	00002
Sharen Sugiarto	89043
1. Register New Audience	
2. Enter the Concert Hall	
3. Search Queue Number	
4. Update Audience Data	
5. Exit	
Input :	

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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FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin	00002
Sharen Sugiarto	89043
Audience Name [2-20 characters]: Jack Steel	
Ticket ID [5 digits number]: 12345	
Do you have a friend in the queue [yes/no]? yes	
Friend's Ticket ID [5 digits number]: 16242	
ADD DATA SUCCESS !!!	

Figure 2. Add New Audience Beside His/Her Friend

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Jack Steel	12345
Calvin	00002
Sharen Sugiarto	89043
Audience Name [2-20 characters]: Robin Jr	
Ticket ID [5 digits number]: 26541	
Do you have a friend in the queue [yes/no]? no	
ADD DATA SUCCESS !!!	

Figure 4. Add New Audience

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Jack Steel	12345
Calvin	00002
Sharen Sugiarto	89043
1. Register New Audience	
2. Enter the Concert Hall	
3. Search Queue Number	
4. Update Audience Data	
5. Exit	
Input :	

Figure 3. After Add New Audience

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Jack Steel	12345
Calvin	00002
Sharen Sugiarto	89043
Robin Jr	26541
1. Register New Audience	
2. Enter the Concert Hall	
3. Search Queue Number	
4. Update Audience Data	
5. Exit	
Input :	

Figure 5. After Add New Audience

✓ **Menu 2: Enter the Concert Hall**

Staff can let the 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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FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin	00002
Sharen Sugiarto	89043
1. Register New Audience	
2. Enter the Concert Hall	
3. Search Queue Number	
4. Update Audience Data	
5. Exit	
Input :2	
Candra Wijaya enter the Concert Hall	

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**.

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin	00002
Sharen Sugiarto	89043
Ticket ID [5 digits number]: 00002	
Queue Number: 4	

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”.

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- **Otherwise**, the application will ask you to input ticket id and new audience name.

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin	00002
Sharen Sugiarto	89043
Ticket ID [5 digits number]: 00002	
Audience Name [2-20 characters]: Calvin Bryan	
UPDATE DATA SUCCESS !!!	

Figure 8. Update Audience Data

FT World Tour Concert	
Name	TicketID
Candra Wijaya	21015
David Aditiya	00132
Kevin Lesmana	16242
Calvin Bryan	00002
Sharen Sugiarto	89043
1. Register New Audience	
2. Enter the Concert Hall	
3. Search Queue Number	
4. Update Audience Data	
5. Exit	
Input :	

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 --