

QUIZ 1  
COMP6048 – Data Structures Even 2019 / 2020  
VAR 9

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 :

$$5 + (5 \times 2 + 4 \times 6) \div 2 \times 7 + 8 + (9 - 1) \times 2$$

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
$\wedge$	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

**Bee Wish**

The “**Bee Wish**” is a simple wish list manager application that implements a linked list as a data structure. The application has 5 menus, there are:

- **Add wish**

This menu has the functionality of adding a wish that he/she wants to add into the list. The user will be asked by the application to input a wish name and the priority of the wish list that will be recorded by the application as depicted below. The mechanism of how to store the data is using a concept of **Priority Queue** where the lower number means higher priority (1 is the higher and 10 is the lower).

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 1

Input wish name [1..100]: Wish One
Input wish priority [1..10]: 1

1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 1

Input wish name [1..100]: Wish Two
Input wish priority [1..10]: 3

1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 1

Input wish name [1..100]: Wish Three
Input wish priority [1..10]: 2

1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 1

Input wish name [1..100]: Wish Four
Input wish priority [1..10]: 1
```

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- **View wish list**

This menu has a functionality to show wishes that are added into the list. The application will print files in the list based on the priority and the added time if the priority is the same.

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 2

01. Wish One #1
02. Wish Four #1
03. Wish Three #2
04. Wish Two #3
```

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 2

Wish list is empty...
```

- **Remove wish**

This menu has a functionality to remove wishes from the wish list. The application will ask a user to input a wish that wants to be deleted from the list. There are possibilities that the file that matched is more than one. Therefore, the application will use a concept of **LIFO** where the last wish that matched will be deleted first. If the wish is not found in the list, the application will show a message “**Wish not found...**”.

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 3

Input wish name [2..100]: Wish One
Success to delete wish "Wish One #1" from download list.
```

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 3

Input wish name [2..100]: Wish Six
wish not found...
```

```
1. Add wish
2. View wish list
3. Remove wish
4. Exit
Please choose: 2

01. Wish Four #1
02. Wish Three #2
03. Wish Two #3
```

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- **Exit**

This menu has a functionality to allow the user to end the system. The application will **remove** all wishes in the list.

*Hint:*

*Use the concept of a “**double linked list**” to make the implementation easier.*

-- Good Luck --