Soal Praktikum *Practicum Case* T0026 Data Structures	
Teknik Informatika *Computer Science*	**C1-T0026-RZ01**
Periode Berlaku Semester Pendek 2016/2017 ***Valid on*** *Compact Semester Year 2016/2017*	**Revisi 00** *Revision 00*

Learning Outcomes
- Demonstrate how to create any learned data structure
- Analyze the usage of data structure in application

Topic
- Session 07 - Binary Search Tree

Sub Topics
- Insert Binary Search Tree
- Searching Binary Search Tree
- Transversal Tree (Inorder, Preorder, Postorder)
- Delete Binary Search Tree (1 node)

Soal
Case

Blue-Luna Online is a MMORPG that is so popular recently. There are many players playing that game. Mr. Ace as one of the Game Master of Blue-Luna Online wants to make an event of Player Wars. He needs a program that contains all the players in that game so he asks you as a skillful programmer to make the program using the binary search tree concept. Here are the descriptions of the program:
- Program consists of 4 menus:
  1. View All Characters
  2. Add New Character
  3. Inorder, Preorder, Postorder Character's Damage
  4. Exit and Popall
- If user chooses **View All Characters**, then :
  - If there is no data in the tree, show the message **"--- There is No Character in The Tree ---"**
  - If data is already in the tree, show the player list (**name**, **job**, **level**, **damage**).
- If user chooses **Add New Character**, then:
  - Ask user to input **character's name**. Validate that the length of **player's name** must be **between 3 and 20 characters** and must not contain **any space character**.
  - Ask user to input **character's job**. Validate that **the job** must be between **"fighter"**, **"rogue"**, and **"mage"**.
  - Ask user to input **character's level**. Validate that **the level** must be **between 1 and 105**.

- Then calculate **the character's damage** with the following rules:
  - ✓ If **the character's job** is **"fighter"**, then:
      [Character's damage] = [character's level] + [random number (0~49)]
  - ✓ If **the character's job** is **"rogue"**, then :
      [Character's damage] = [character's level] + [random number (0~24)]
  - ✓ If **the character's job** is **"mage"**, then :
      [Character's damage] = [character's level] + [random number (0~74)]
- If tree is still empty, then data will be inserted automatically.
- The data is inserted into the tree using **BST Concept based on the character's damage**.
- If data has been successfully inputted, then show the message **"--- Add New Character Success ---"**

- If user chooses **Inorder, Preorder, Postorder**, then:
  - If there is no data in the tree, show the message **"--- There is No Character in The Tree ---"**
  - If data is already in the tree, show the **character's damage** in in-order, pre-order, and post-order.
- If user chooses **Exit**, then:
  - Delete all data in the linked list.
  - Program ends.

Please run the EXE file to see the sample program.

Print Screen of Main Menu

```
BLUE-LUNA ONLINE
ooooooooooooooooo

1. View All Characters
2. Add New Character
3. Inorder, Preorder, Postorder Character's Damage
4. Exit and Popall

>> Input choice :
```

Print Screen of View All Characters (Menu '1')

```
Character List :

* Carnations        | fighter  | lvl. 105 | damage : 115
* Wyvern            | rogue    | lvl.  78 | damage :  84
* DemonWitch        | mage     | lvl.  45 | damage :  74
* Luvtin            | rogue    | lvl.  99 | damage : 100
```

Print Screen of Add New Character (Menu '2')

```
Input Character's Name [3..20][non space char]: Carnations

Input Character's Job [fighter/rogue/mage]: fighter

Input Character's Level [1..105]: 105



--- Add New Character Success ---
```

Print Screen of Inorder, Preorder, Postorder Menu (Menu '3')

```
Preorder  : 115 84 74 100
Inorder   : 74 84 100 115
Postorder : 74 100 84 115
```