Soal Praktikum *Practicum Case* COMP6362 Data Structures	
Teknik Informatika *Computer Science*	CS-COMP6362-Var02.1
Periode Berlaku Mulai Semester Genap 2019/2020 ***Valid on*** *Even Semester Year* 2019/2020	**Revisi 00** *Revision 00*

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

Topic
- Session 09 - Binary Search Tree

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

Soal
Case

La Otto Car is a famous car vendor. It has leaded the market for about 9 years. Mr. Otto as the Vice President of La Otto Car wants to implement IT technology on his Car Product Price List. So he asks you as a skillful programmer to make the program using a binary search tree concept. Here are the descriptions of the program:

- Program consists of 4 menus:
  1. Add New Car
  2. Update Car Price
  3. InOrder, PreOrder, PostOrder
  4. Exit

- If user chooses **Add New Car**, then:
  - Ask user to input **car code**. Validate that **the car code** must be in this format:
    X[1-9][0-9][0-9]
  - Ask user to input **car price**. Validate that the car price must be **between $4000 and $99999**.
  - If **the car code** already exists in the tree, then show the message:
    "--- Add New Car Failure ---"
    "Err : Car Code Already Exists"

- If tree is still empty, data will be inserted automatically.
- The data is inserted into the tree by using **BST Concept based on the car code**.
- Maximum tree level is 4. If level is already at maximum, then show the message **"--- Maximum Tree Level is 4 ---"**
- If data has been successfully inputted, show the message **"--- Add New Car Success ---"**

- If user chooses **Update Car Price**, then:
  - Ask user to input **car code** whereas **the car code** must be in this format:
    X[1-9] [0-9] [0-9]
  - If data can be found, the program will show the car's attributes in this format:
    "Car Code : [Car Code]"
    "Car Price : [Car Price]"
    Then ask user to input **a new car price** for **the car code**. Validate that **the new car price** must be **between $4000 and $99999**.
  - If data has been successfully changed, then show the message **"--- Update Car Price Success ---"**
  - If data cannot be found, then show the message **"--- Car Code is Not Found ---"**

- If user chooses **Inorder, Preorder, Postorder**, then:
  - If there is no data in the tree, show the message **"--- There is No Car in The Tree ---"**
  - If data is already in the tree, show **the attributes of all cars** in in-order, pre-order, and post-order.

- If user chooses **Exit**, then:
  - Delete all data in the tree.
  - Program ends.

Please run the EXE file to see the sample program.

Print Screen of Main Menu

```
LA OTTO CAR
***********

1. Add New Car
2. Update Car Price
3. InOrder, PreOrder, PostOrder
4. Exit

>> Input choice :
```

Print Screen of Add New Car Menu (Menu '1')

```
Input Car Code X[1-9][0-9][0-9]: X444

Input Car Price [$4000..$99999]: $4500


--- Add New Car Success ---
```

Print Screen of Add New Car Menu (Menu '1')
When The Tree is Not Empty and Inputed Car is Reached The Maximum Tree Level

```
Input Car Code X[1-9][0-9][0-9]: X789

Input Car Price [$4000..$99999]: $7700


--- Maximum Tree Level is 4 ---
```

Print Screen of Update Car Price Menu (Menu '2')

```
Input Car Code X[1-9][0-9][0-9]: X678

Car Code   : X678
Car Price : $   6780

Input New Car Price [$4000..$99999]: 9870


--- Update Car Price Success ---
```

Print Screen of Inorder, Preorder, Postorder Menu (Menu '3') When tree is empty

```
--- There is No Car in The Tree ---
```

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

```
Preorder  :
- X444 [ $   4500 ]
- X456 [ $   4560 ]
- X555 [ $   5500 ]
- X678 [ $   9870 ]

Inorder   :
- X444 [ $   4500 ]
- X456 [ $   4560 ]
- X555 [ $   5500 ]
- X678 [ $   9870 ]

Postorder :
- X678 [ $   9870 ]
- X555 [ $   5500 ]
- X456 [ $   4560 ]
- X444 [ $   4500 ]
```