

b) Given the definition of FloodLosses, TreeNode and BSTFloodLosses ADTs :

```

public class FloodLosses {
    private String damageType;
    private double valueOfLosses;
    private int year;

    /*** Definition of the other methods including
    normal constructor, mutators, accessors, processors,
    and toString() printer
    ***/
}

public class TreeNode {

    FloodLosses data;
    TreeNode left, right;
    /*** Definition of the other methods ***/
}

public class BSTFloodLosses {

    TreeNode root;
    public BSTFloodLosses(){...} //constructor
    public void insertNode(FloodLosses){...}
    public void displayAll(){...}
    public double calTotalLosses(int) {...}
    public void countNumOfDamages(){...}
    /*** Definition of the other methods ***/
}
    
```

The table below shows the data on the value of flood losses in Malaysia from 2021 until 2022.

Type of Damage	Value of Losses (RM million)	Year
Living quarters	157.4	2022
Vehicles	18.8	2022
Business premises	50.3	2022
Agriculture	154.5	2022
Manufacturing	8.7	2022
Public assets and infrastructure	232.7	2022
Living quarters	1622.0	2021
Vehicles	982.8	2021
Business premises	525.8	2021
Agriculture	90.6	2021
Manufacturing	891.4	2021
Public assets and infrastructure	2000	2021

Source from <https://www.dosm.gov.my>

- i) Based on the above table, using the **value of losses** as the key value, draw a Binary Search Tree to illustrate the structure of the stored data.
(5 marks)
- ii) Write the definition for method `displayAll()` and its recursive method to display the details of losses in descending order according to the value of losses.
(5 marks)
- iii) Write the definition for method `calTotalLosses(int)` and its recursive method to calculate and return the total amount of losses based on the year that is passed through its parameter.
(5 marks)
- iv) Write the definition for method `countNumOfDamages()` and its recursive method to count and display the number of damages that have value of losses less than RM200 million.
(5 marks)
- c) In the application class, write Java code segments to perform the following tasks:
- i. Instantiate an object of `BSTFloodLosses` named `bstFL`.
 - ii. Prompt user to input data for 20 objects of `FloodLosses` class and store them into `bstFL`.
 - iii. Calculate and display the differences of the total amount of losses between the year 2022 and 2021.
(5 marks)

END OF QUESTION PAPER