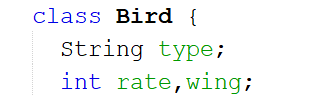
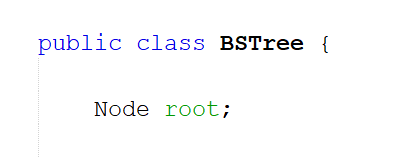
[Download given files here](https://drive.google.com/file/d/1bHMOCsBKSEiNqqwrTOIm-HyZd0YAuTSX/view?usp=share_link)

The class Bird has 3 data members as the below picture



The class BSTree is Binary Search Tree of Bird objects with **rate is key** of the tree



The following methods should be completed in BSTree.java file

String f0(){ //Enter your RollNumber in format HExxxxxx

String RollNumber =””;

return RollNumber ;

}

void insert(String xType, int xRate, int xWing) - check if the first character of xType is B or xRate>10 then do nothing, otherwise insert new Bird object with type = xType, rate=xRate,wing=xWing to the tree.

void f1() - Your task is to complete the insert method above only.

Output must be the following:

A,5,9) (E,2,5) (D,8,6) (F,-6,7) (X,4,5) (Y,6,-7)

(A,5,9) (E,2,5) (D,8,6) (F,-6,7) (X,4,5) (Y,6,-7)

-void f2() - perform breadth-first traversal from the root but display only nodes with wing in [4 10].

Output must be the following:

(C1,9,2) (D,6,2) (F,2,3) (Z,8,1) (H,1,7) (I,3,9) (Z1,7,1) (J,5,5) (K,4,1)

(H,1,7) (I,3,9) (J,5,5)

-void f3() - perform pre-order traversal from the root but display nodes at odd positions only, the root is assigned as the first odd node.

Output must be the following:

C,8,2) (D,6,1) (F,2,3) (H,1,7) (I,3,9) (J,5,5) (K,4,6) (G,7,8) (E,9,4)

(C,8,2) (F,2,3) (I,3,9) (K,4,6) (E,9,4)

-void f4() - perform in-order traversal from the root but display only nodes with wings less than 4, and rates greater than 6.

Output must be the following:

(C,8,2) (D,6,1) (F,2,3) (H,1,7) (I,3,9) (J,5,8) (K,4,6) (G,7,3) (E,9,4)

(G,7,3) (C,8,2)

-void f5() - perform post-order traversal from the root but display only nodes with the first character of the type is ‘A’ or ‘C’

Output must be the following:

(H,1,7) (A1,4,6) (J,5,8) (C1,3,9) (A,2,3) (G,7,3) (D,6,1) (E,9,4) (C,8,2)

(A1,4,6) (C1,3,9) (A,2,3) (C,8,2)

void f6() - Suppose p is the 5-th node when performing the in-oder traversal of the tree and f is father of p. Delete the node f by copying.

Output must be the following:

(F,-6,7) (E,2,5) (X,4,5) (A,5,9) (Y,6,-7) (D,8,6)

(F,-6,7) (E,2,5) (X,4,5) (A,5,9) (Y,6,-7)

void f7() - Suppose p is the 6-th node when performing the post-order traversal of the tree. Delete the node p by merging.

Output must be the following:

(F,-6,7) (X,4,5) (E,2,5) (Y,6,-7) (D,8,6) (A,5,9)

(F,-6,7) (Y,6,-7) (D,8,6) (X,4,5) (E,2,5)

void f8() - Suppose p is a 4-th node when performing the bread-first traversal of the tree. Find the height of Node p and suppose this height is k,then set the wing of p equal k.

Output must be the following:

(A,5,9) (C,-9,4) (D,8,6) (E,2,5) (Y,6,-7) (X,9,5) (F,-6,7)

(A,5,9) (C,-9,4) (D,8,6) (E,2,2) (Y,6,-7) (X,9,5) (F,-6,7)

void f9() - Suppose p is a 6-th node when performing the pre-order traversal of the tree. Find the height of Node p and suppose this height is k,then set the wing of p equal k.

Output must be the following:

(A,5,9) (C,-9,4) (E,2,5) (F,-6,7) (D,8,6) (Y,6,-7) (X,9,5)

(A,5,9) (C,-9,4) (E,2,5) (F,-6,7) (D,8,6) (Y,6,1) (X,9,5)

void f10() - Perform in-order traversal from root of the tree and find node p is the first node has two children and rate < 5, then rotate p to right about its’ left son.

Output must be the following:

(A,5,9) (E,2,5) (D,8,6) (F,-6,7) (X,4,5) (Y,6,-7)

(A,5,9) (F,-6,7) (D,8,6) (E,2,5) (Y,6,-7) (X,4,5)

void f11() - Perform post-order traversal from root of the tree and find node p is the first node has right son and rate > 7, then rotate p to left about its’ right son.

Output must be the following:

(A,5,9) (E,2,5) (D,8,6) (F,-6,7) (X,4,5) (Y,6,-7) (Z,9,1)

(A,5,9) (E,2,5) (Z,9,1) (F,-6,7) (X,4,5) (D,8,6) (Y,6,-7)