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Project 4 - BST Final Test Document

Function and method prototypes

Constructors

BNode(T d);

BNode(T d, BNode<T>\* l, BNode<T>\* r);

BST();

~BST();

BST(const BST<T> &B1);

Helpers

BNode<T>\* SearchHelper(BNode<T>\* b, int item)const;

BNode<T>\* Copy(BNode<T>\* src) const;

void PrintPostOrderHelper(BNode<T>\* b)const;

void PrintPreOrderHelper(BNode<T>\* b)const;

void PrintInOrderHelper(BNode<T>\* b)const;

void empty(BNode<T>\* &src);

bool InsertHelper(BNode<T>\*& b, T e);

Mutators

bool Insert();

void Delete();

Accessors

void PrintInOrder()const;

void PrintPreOrder()const;

void PrintPostOrder()const;

void PrintCursor()const;

BNode<T>\* Search()const;

BNode<T>\* FindMin(BNode<T>\*& b);

void moveLeft();

void moveRight();

void moveBegin();

void moveEnd();

void DestroyRecursive(BNode<T>\* node);

void BuildDataSet();

Overload

BST& operator=(const BST<T> &); Driver

Driver

int Menu();

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operation** | **Expected Outcome** | **Trial 1 - Outcome (Date/Time)** | **Trial 2 - Outcome (Date/Time)** | **Trial N- Outcome (Date/Time)** |
| Insert (+21) to empty tree | [21] | [21]  3-20/ 7:00 PM | [21]  3-20/ 9:00 PM | [21]  3-20/ 11:00 PM |
| Insert (+10+3+41+  8+25+50) to [21] | [21 10 3 41 8 25[50]] | [3 8 10 21 25 41 [50]]  3-20/ 7:00 PM | [3 8 10 21 25 41 [50]]  3-20/ 9:00 PM | [3 8 10 21 25 41 [50]]  3-20/ 11:00 PM |
| Insert (+10) to  [21 10 3 41 8 25[50]] | No Duplicates | No Duplicates  3-20/ 7:00 PM | No Duplicates  3-20/ 9:00 PM | No Duplicates  3-20/ 11:00 PM |
| Print Post order S  [21 10 3 41 8 50 [25]] | [8 3 10 25 50 41[21]] | [8 3 10 25 [50] 41 21]  3-20/ 7:00PM | [8 3 10 25 [50] 41 21]  3-20/ 9:00 PM | [8 3 10 25 [50] 41 21]  3-20/ 11:00 PM |
| Print Pre order R  [21 10 3 41 8 50 [25]] | [21 8 3 10 35 50[41]] | [21 10 3 8 41 25[50]]  3-20/ 7:00 PM | [21 10 3 8 41 25[50]]  3-20/ 9:00 PM | [21 10 3 8 41 25[50]]  3-20/ 11:00 PM |
| Print In order P  [21 10 3 41 8 50 [25]] | [3 8 10 21 25 41[50]] | [3 8 10 21 25 41 [50]]  3-20/ 7:00 PM | [3 8 10 21 25 41 [50]] | [3 8 10 21 25 41 [50]]  3-20/ 11:00 PM |
| Search Item (?41) on  [ 3 8 10 21 25 41 50] | 41 | ?41  Found: 41  3-20/ 7: 00 PM | ?3  []  3-20/ 9:00 PM | ?10  Found: 10  3-20/ 11:00 PM |
| Remove Item  delete(-) from: 3  [ 8 10 21 25 41 [50]] | [[8] 10 21 25 41 50] | -3  [[8] 10 21 25 41 50]  3-20/ 7: 00PM | -2  []  3-20/ 9:00 PM | -10  [[8] 21 25 41 50]  3-20/ 11:00 PM |
| Move cursor to the beginning of  [ 8 10 21 25 41 [50]] | [[8] 10 21 25 41 50] | [[21] 10 8 25 41 50]  3-20/ 7: 00 PM | [[21] 10 8 25 41 50]  3-20/ 9:00 PM | [[21] 10 8 25 41 50]  3-20/ 11:00 PM |
| **Operation** | **Expected Outcome** | **Trial 1 - Outcome (Date/Time)** | **Trial 2 - Outcome (Date/Time)** | **Trial N- Outcome (Date/Time)** |
| Move cursor to the end of  [[8] 10 21 25 41 50] | [ 8 10 21 25 41 [50]] | [ 8 10 21 25 41 [50]] 3-20/ 7:00 PM | [ 8 10 21 25 41 [50]]  3-20/ 9:00 PM | [ 8 10 21 25 41 [50]]  3-20/ 11:00 PM |
| Move cursor to the right > of  [ 8 10 21 25 41 [50]] | [[8] 10 21 25 41 50] | [[21] 8 10 25 41 50] 3-20/ 7:00 PM | [8 10 21 [41] 25 50]  3-20/ 9:00 PM | [8 10 21 25 41 [50]]  3-20/ 11:00 PM |
| Move cursor to the left < of  [ 8 10 21 25 41 [50]] | [8 10 21 25 [41] 50] | [[21] 8 10 25 41 50] 3-20/ 7:00 PM | [[10] 8 21 25 41 50]  3-20/ 9:00 PM | [[8] 10 21 25 41 50]  3-20/ 11:00 PM |
| Print item at the cursor @ of  [8 10 21 25 41 [50]] | [8 10 21 25 41 [50]]  50 | [8 10 21 25 41 [50]]  50  3-20/ 7:00 PM | [[21] 8 10 25 41 50]  21  3-20/ 9:00 PM | [[8] 10 21 25 41 50]  8  3-20/ 11:00 PM |
| Print List P  [8 [10] 21 25 41 50] | [8 [10] 21 25 41 50] | [8 [10] 21 25 41 50] 3-20/ 7:00 PM | [8 [10] 21 25 41 50]  3-20/ 9:00 PM | [8 [10] 21 25 41 50]  3-20/ 11:00 PM |
| 1.Test Copy Constructor of  [8 10 21 [25] 41 50] | [8 10 21 [25] 41 50] | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50] 3-20/ 7:00 PM | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50]  3-20/ 9:00 PM | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50]  3-20/ 11:00 PM |
| 2. Test Assignment Operator of  [8 10 [21] 25 41 50]  P = Q | [8 10 [21] 25 41 50] | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50] 3-20/ 7:00PM | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50]  3-20/ 9:00 PM | Orginal List  [8 10 21 [25] 41 50]  Copied List  [8 10 21 [25] 41 50]  3-20/ 11:00 PM |
| 3. Test Destructor  [8 10 [21] 25 41 50]  Q.~BST() | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Print Post order S of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Print Pre order R of empty tree | Tree is empty  [] | []  3-20/ 7: PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Print In order P of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Search Item (?5) on empty list | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Remove Item  delete(-) from empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Move cursor to the beginning of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| **Operation** | **Expected Outcome** | **Trial 1 - Outcome (Date/Time)** | **Trial 2 - Outcome (Date/Time)** | **Trial N- Outcome (Date/Time)** |
| Move cursor to the end of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Move cursor to the right > of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Move cursor to the left < of empty tree | Tree is empty  [] | [] | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Print item at the cursor @ of empty tree | Cursor points to NULL | 1708944  []  3-20/ 7: 00 PM | 4709924  [] | 8084924  []  3-20/ 11:00 PM |
| Print List P of empty list | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Build Large Set of Data to empty tree B | [1 2… [N]] | [1 2… [N]]  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| Build Large Set of Data to [10 20 5 3] | [1 2… [N]] | [1 2… [N]]  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| 1.Test Copy Constructor of empty tree | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| 2. Test Assignment Operator of empty tree  P = Q | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |
| 3. Test Destructor of empty tree  Q.~BST() | Tree is empty  [] | []  3-20/ 7: 00 PM | []  3-20/ 9:00 PM | []  3-20/ 11:00 PM |