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Binary tree implementation in c++

[**Raw**](https://gist.github.com/toboqus/def6a6915e4abd66e922/raw/73ccc51f5482a1aa07e68310807dddcd32258c3e/btree.cpp)

[**btree.cpp**](https://gist.github.com/toboqus/def6a6915e4abd66e922#file-btree-cpp)

|  |  |
| --- | --- |
|  | #include <iostream> |
|  |  |
|  | using namespace std; |
|  |  |
|  |  |
|  | struct node{ |
|  | int value; |
|  | node \*left; |
|  | node \*right; |
|  | }; |
|  |  |
|  | class btree{ |
|  | public: |
|  | btree(); |
|  | ~btree(); |
|  |  |
|  | void insert(int key); |
|  | node \*search(int key); |
|  | void destroy\_tree(); |
|  | void inorder\_print(); |
|  | void postorder\_print(); |
|  | void preorder\_print(); |
|  |  |
|  | private: |
|  | void destroy\_tree(node \*leaf); |
|  | void insert(int key, node \*leaf); |
|  | node \*search(int key, node \*leaf); |
|  | void inorder\_print(node \*leaf); |
|  | void postorder\_print(node \*leaf); |
|  | void preorder\_print(node \*leaf); |
|  |  |
|  | node \*root; |
|  | }; |
|  |  |
|  |  |
|  | btree::btree(){ |
|  | root = NULL; |
|  | } |
|  |  |
|  | btree::~btree(){ |
|  | destroy\_tree(); |
|  | } |
|  |  |
|  | void btree::destroy\_tree(node \*leaf){ |
|  | if(leaf != NULL){ |
|  | destroy\_tree(leaf->left); |
|  | destroy\_tree(leaf->right); |
|  | delete leaf; |
|  | } |
|  | } |
|  |  |
|  | void btree::insert(int key, node \*leaf){ |
|  |  |
|  | if(key < leaf->value){ |
|  | if(leaf->left != NULL){ |
|  | insert(key, leaf->left); |
|  | }else{ |
|  | leaf->left = new node; |
|  | leaf->left->value = key; |
|  | leaf->left->left = NULL; |
|  | leaf->left->right = NULL; |
|  | } |
|  | }else if(key >= leaf->value){ |
|  | if(leaf->right != NULL){ |
|  | insert(key, leaf->right); |
|  | }else{ |
|  | leaf->right = new node; |
|  | leaf->right->value = key; |
|  | leaf->right->right = NULL; |
|  | leaf->right->left = NULL; |
|  | } |
|  | } |
|  |  |
|  | } |
|  |  |
|  | void btree::insert(int key){ |
|  | if(root != NULL){ |
|  | insert(key, root); |
|  | }else{ |
|  | root = new node; |
|  | root->value = key; |
|  | root->left = NULL; |
|  | root->right = NULL; |
|  | } |
|  | } |
|  |  |
|  | node \*btree::search(int key, node \*leaf){ |
|  | if(leaf != NULL){ |
|  | if(key == leaf->value){ |
|  | return leaf; |
|  | } |
|  | if(key < leaf->value){ |
|  | return search(key, leaf->left); |
|  | }else{ |
|  | return search(key, leaf->right); |
|  | } |
|  | }else{ |
|  | return NULL; |
|  | } |
|  | } |
|  |  |
|  | node \*btree::search(int key){ |
|  | return search(key, root); |
|  | } |
|  |  |
|  | void btree::destroy\_tree(){ |
|  | destroy\_tree(root); |
|  | } |
|  |  |
|  | void btree::inorder\_print(){ |
|  | inorder\_print(root); |
|  | cout << "\n"; |
|  | } |
|  |  |
|  | void btree::inorder\_print(node \*leaf){ |
|  | if(leaf != NULL){ |
|  | inorder\_print(leaf->left); |
|  | cout << leaf->value << ","; |
|  | inorder\_print(leaf->right); |
|  | } |
|  | } |
|  |  |
|  | void btree::postorder\_print(){ |
|  | postorder\_print(root); |
|  | cout << "\n"; |
|  | } |
|  |  |
|  | void btree::postorder\_print(node \*leaf){ |
|  | if(leaf != NULL){ |
|  | inorder\_print(leaf->left); |
|  | inorder\_print(leaf->right); |
|  | cout << leaf->value << ","; |
|  | } |
|  | } |
|  |  |
|  | void btree::preorder\_print(){ |
|  | preorder\_print(root); |
|  | cout << "\n"; |
|  | } |
|  |  |
|  | void btree::preorder\_print(node \*leaf){ |
|  | if(leaf != NULL){ |
|  | cout << leaf->value << ","; |
|  | inorder\_print(leaf->left); |
|  | inorder\_print(leaf->right); |
|  | } |
|  | } |
|  |  |
|  | int main(){ |
|  |  |
|  | //btree tree; |
|  | btree \*tree = new btree(); |
|  |  |
|  | tree->insert(10); |
|  | tree->insert(6); |
|  | tree->insert(14); |
|  | tree->insert(5); |
|  | tree->insert(8); |
|  | tree->insert(11); |
|  | tree->insert(18); |
|  |  |
|  | tree->preorder\_print(); |
|  | tree->inorder\_print(); |
|  | tree->postorder\_print(); |
|  |  |
|  | delete tree; |
|  |  |
|  | } |

|  |
| --- |
|  |