My Project

Generated by Doxygen 1.8.17

Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

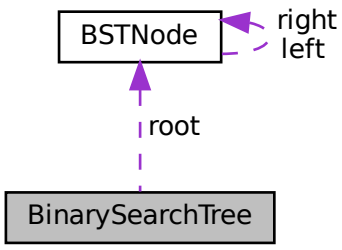
Chapter 3

Class Documentation

3.1 BinarySearchTree Class Reference

BinarySearchTree class. Available member functions include default constructor, insert, traverse and height.

Collaboration diagram for BinarySearchTree:



Public Types

- enum order { **PRE**, **IN**, **POST** }

  types of traversals

Public Member Functions

- BinarySearchTree ()

  Construct a new Binary Search Tree object.
- void insert (ll val)

  Insert an element into the tree.
- void traverse (BSTNode ∗T, order tt)

  Traverse the tree.
- ll height (BSTNode ∗T)

  Calculate height of the tree.

Public Attributes

- BSTNode * root
  pointer to the root

3.1.1 Detailed Description

BinarySearchTree class. Available member functions include default constructor, insert, traverse and height.

3.1.2 Member Function Documentation

3.1.2.1 height()

```
ll BinarySearchTree::height (
            BSTNode * T )  [inline]
```

Calculate height of the tree.

Parameters

in	*T*	tree root pointer

Returns

ll

3.1.2.2 insert()

```
void BinarySearchTree::insert (
            ll val )  [inline]
```

Insert an element into the tree.

Parameters

in	*val*	value to be inserted

3.1.2.3 traverse()

```
void BinarySearchTree::traverse (
```

```
            BSTNode * T,
            order tt )  [inline]
```

Traverse the tree.

Parameters

in	*T*	tree root pointer
	tt	type of traversal

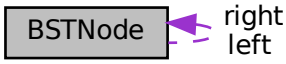
The documentation for this class was generated from the following file:

- DSA.cpp

3.2 BSTNode Class Reference

BST Node class. Available member functions include initialising constructor.

Collaboration diagram for BSTNode:



Public Member Functions

- BSTNode (ll val)

  Construct a new BSTNode object.

Public Attributes

- ll info

  info stored in the node
- ll level

  level of the node
- BSTNode * left

  pointer to the left child
- BSTNode * right

  pointer to the right child

3.2.1 Detailed Description

BST Node class. Available member functions include initialising constructor.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 BSTNode()

```
BSTNode::BSTNode (
            ll val )  [inline]
```

Construct a new BSTNode object.

Parameters

in	*val*	input value of the node

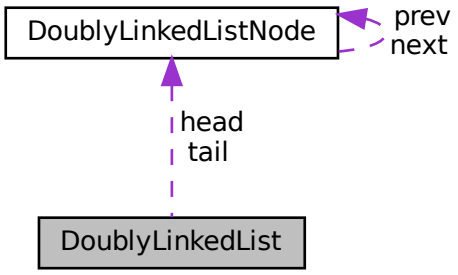
The documentation for this class was generated from the following file:

- DSA.cpp

3.3 DoublyLinkedList Class Reference

Doubly Linked List class. Available member functions include default constructor, insert, printer and reverse.

Collaboration diagram for DoublyLinkedList:



Public Member Functions

- DoublyLinkedList ()

  Construct a new Doubly Linked List object.
- void insert (ll data)

  Insert an element into the list.
- void printer (string sep=", ")

  Print the list.
- void reverse ()

  Reverse the list.

Public Attributes

- DoublyLinkedListNode * head
  pointer to the head
- DoublyLinkedListNode * tail
  pointer to the tail

3.3.1 Detailed Description

Doubly Linked List class. Available member functions include default constructor, insert, printer and reverse.

3.3.2 Member Function Documentation

3.3.2.1 insert()

```
void DoublyLinkedList::insert (
            ll data )  [inline]
```

Insert an element into the list.

Parameters

in	*data*	value to be inserted

3.3.2.2 printer()

```
void DoublyLinkedList::printer (
            string sep = ", " )  [inline]
```

Print the list.

Parameters

in	*sep*	separator string

The documentation for this class was generated from the following file:

- DSA.cpp

3.4 DoublyLinkedListNode Class Reference

Doubly Linked List Node class. Available member functions include default constructor and initialising constructor.

Collaboration diagram for DoublyLinkedListNode:

Public Member Functions

- DoublyLinkedListNode ()

  Construct a new Doubly Linked List Node object.
- DoublyLinkedListNode (ll val)

  Construct a new Doubly Linked List Node object.

Public Attributes

- ll data

  data stored in the node
- DoublyLinkedListNode * next

  pointer to the next node
- DoublyLinkedListNode * prev

  pointer to the previous node

3.4.1 Detailed Description

Doubly Linked List Node class. Available member functions include default constructor and initialising constructor.

3.4.2 Constructor & Destructor Documentation

3.4.2.1 DoublyLinkedListNode()

```
DoublyLinkedListNode::DoublyLinkedListNode (
            ll val )  [inline]
```

Construct a new Doubly Linked List Node object.

Parameters

in	*val*	input value for the node

The documentation for this class was generated from the following file:

- DSA.cpp

3.5 Heap Class Reference

Public Member Functions

- Heap (int capacity)
  Construct a new Heap object.
- int parent (int i)
  Parent function.
- int left (int i)
  Left child function.
- int right (int i)
  Right child function.
- void insert (int e)
  Insert function.
- int min ()
  Minimum of heap.
- void Heapify (int root)
  Heapify function.
- void deleteMin ()
  Delete minimum.

3.5.1 Constructor & Destructor Documentation

3.5.1.1 Heap()

```
Heap::Heap (
            int capacity )  [inline]
```

Construct a new Heap object.

Parameters

in	*capacity*	max capacity of heap

3.5.2 Member Function Documentation

3.5.2.1 Heapify()

```
void Heap::Heapify (
            int root )  [inline]
```

Heapify function.

Parameters

in	*root*	root node

3.5.2.2 insert()

```
void Heap::insert (
            int e )  [inline]
```

Insert function.

Parameters

in	*e*	value to insert

3.5.2.3 left()

```
int Heap::left (
            int i )  [inline]
```

Left child function.

Parameters

in	*i*	index of node

Returns

int

3.5.2.4 min()

```
int Heap::min ( )  [inline]
```

Minimum of heap.

Returns

int

3.5.2.5 parent()

```
int Heap::parent (
            int i )  [inline]
```

Parent function.

Parameters

in	*i*	index of node

Returns

int

3.5.2.6 right()

```
int Heap::right (
            int i )  [inline]
```

Right child function.

Parameters

in	*i*	index of node

Returns

int

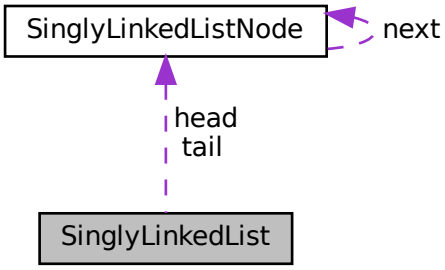
The documentation for this class was generated from the following file:

- DSA.cpp

3.6 SinglyLinkedList Class Reference

Singly Linked List class. Available member functions include default constructor, insert, find, deleteVal, printer and reverse.

Collaboration diagram for SinglyLinkedList:



Public Member Functions

- SinglyLinkedList ()

  Construct a new Singly Linked List object.
- void insert (ll data)

  Insert an element into the list.
- SinglyLinkedListNode * find (ll data)

  Find an element in the list.
- bool deleteVal (ll data)

  Delete an element from list.
- void printer (string sep=", ")

  Print the list.
- void reverse ()

  Reverse the list.

Public Attributes

- SinglyLinkedListNode * head

  pointer to the head
- SinglyLinkedListNode * tail

  pointer to the tail

3.6.1 Detailed Description

Singly Linked List class. Available member functions include default constructor, insert, find, deleteVal, printer and reverse.

3.6.2 Member Function Documentation

3.6.2.1 deleteVal()

```
bool SinglyLinkedList::deleteVal (
            ll data )  [inline]
```

Delete an element from list.

Parameters

in	*data*	value to be deleted

Returns

true/false

3.6.2.2 find()

```
SinglyLinkedListNode* SinglyLinkedList::find (
            ll data )  [inline]
```

Find an element in the list.

Parameters

in	*data*	value to be found

Returns

SinglyLinkedListNode∗

3.6.2.3 insert()

```
void SinglyLinkedList::insert (
            ll data )  [inline]
```

Insert an element into the list.

Parameters

in	*data*	value to be inserted

3.6.2.4 printer()

```
void SinglyLinkedList::printer (
            string sep = ", " )  [inline]
```

Print the list.

Parameters

in	*sep*	separator string

The documentation for this class was generated from the following file:

- DSA.cpp

3.7 SinglyLinkedListNode Class Reference

Singly Linked List Node class. Available member functions include default constructor and initialising constructor.

Collaboration diagram for SinglyLinkedListNode:

Public Member Functions

- SinglyLinkedListNode ()
  Construct a new Singly Linked List Node object.
- SinglyLinkedListNode (ll val)
  Construct a new Singly Linked List Node object.

Public Attributes

- ll data
  data stored in the node
- SinglyLinkedListNode * next
  pointer to the next node

3.7.1 Detailed Description

Singly Linked List Node class. Available member functions include default constructor and initialising constructor.

3.7.2 Constructor & Destructor Documentation

3.7.2.1 SinglyLinkedListNode()

```
SinglyLinkedListNode::SinglyLinkedListNode (
            ll val )  [inline]
```

Construct a new Singly Linked List Node object.

Parameters

in	*val*	input value for the node

The documentation for this class was generated from the following file:

- DSA.cpp

3.8 Trie Class Reference

Trie class. Available member functions include default constructor, find, insert, checkPrefix and countPrefix.

Public Member Functions

- Trie ()
  Construct a new Trie object.
- bool find (Trie *T, char c)
  Find a char in a trie.
- void insert (string s)
  Insert string into a trie.
- bool checkPrefix (string s)
  Check if a string is a prefix.
- ll countPrefix (string s)
  Count how many strings have the given prefix.

Public Attributes

- ll count
  count of the string from root to leaf
- map< char, Trie * > nodes
  map/dictionary of nodes

3.8.1 Detailed Description

Trie class. Available member functions include default constructor, find, insert, checkPrefix and countPrefix.

3.8.2 Member Function Documentation

3.8.2.1 checkPrefix()

```
bool Trie::checkPrefix (
            string s )  [inline]
```

Check if a string is a prefix.

Parameters

in	*s*	string to check

Returns

true/false

3.8.2.2 countPrefix()

```
ll Trie::countPrefix (
            string s )  [inline]
```

Count how many strings have the given prefix.

Parameters

in	*s*	prefix to check

Returns

ll

3.8.2.3 find()

```
bool Trie::find (
            Trie * T,
            char c )  [inline]
```

Find a char in a trie.

Parameters

in	*T*	trie root pointer
in	*c*	char to find

Returns

true/false

3.8.2.4 insert()

```
void Trie::insert (
            string s )  [inline]
```

Insert string into a trie.

Parameters

in	*s*	string to insert

The documentation for this class was generated from the following file:

- DSA.cpp

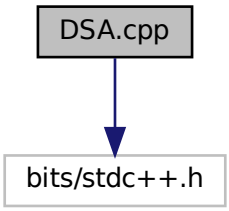
Chapter 4

File Documentation

4.1 DSA.cpp File Reference

C++ implementations of data structures and their utility functions.

`#include <bits/stdc++.h>`
Include dependency graph for DSA.cpp:



Classes

- class SinglyLinkedListNode

  Singly Linked List Node class. Available member functions include default constructor and initialising constructor.
- class SinglyLinkedList

  Singly Linked List class. Available member functions include default constructor, insert, find, deleteVal, printer and reverse.
- class DoublyLinkedListNode

  Doubly Linked List Node class. Available member functions include default constructor and initialising constructor.
- class DoublyLinkedList

  Doubly Linked List class. Available member functions include default constructor, insert, printer and reverse.
- class BSTNode

  BST Node class. Available member functions include initialising constructor.
- class BinarySearchTree

  BinarySearchTree class. Available member functions include default constructor, insert, traverse and height.
- class Trie

  Trie class. Available member functions include default constructor, find, insert, checkPrefix and countPrefix.
- class Heap

Macros

- #define ll long long int
  long long int macro
- #define vi vector<int>
  int vector macro
- #define vll vector<ll>
  long long vector macro

Functions

- ostream & operator<< (ostream &out, const SinglyLinkedListNode &node)
  Function to print a Singly Linked List Node.
- SinglyLinkedList merge (SinglyLinkedList list1, SinglyLinkedList list2)
  Merge two sorted linked lists.
- ostream & operator<< (ostream &out, const DoublyLinkedListNode &node)
  Function to print a Doubly Linked List Node.
- ostream & operator<< (ostream &out, const BSTNode &node)
  Function to print a BST Node.
- void swap (int &x, int &y)
  Swap function.

4.1.1 Detailed Description

C++ implementations of data structures and their utility functions.

Author

Sarthak Mittal (200050129@iitb.ac.in)

Version

1

Date

2022-09-17

4.1.2 Function Documentation

4.1.2.1 merge()

```
SinglyLinkedList merge (
            SinglyLinkedList list1,
            SinglyLinkedList list2 )
```

Merge two sorted linked lists.

Parameters

in	*list1*	first list
in	*list2*	second list

Returns

SinglyLinkedList

4.1.2.2 operator<<() [1/3]

```
ostream& operator<< (
            ostream & out,
            const BSTNode & node )
```

Function to print a BST Node.

Parameters

in	*out*	standard output stream
in	*node*	the node to be printed

Returns

ostream&

4.1.2.3 operator<<() [2/3]

```
ostream& operator<< (
            ostream & out,
            const DoublyLinkedListNode & node )
```

Function to print a Doubly Linked List Node.

Parameters

in	*out*	standard output stream
in	*node*	the node to be printed

Returns

ostream&

4.1.2.4 operator<<() [3/3]

```
ostream& operator<< (
            ostream & out,
            const SinglyLinkedListNode & node )
```

Function to print a Singly Linked List Node.

Parameters

in	*out*	standard output stream
in	*node*	the node to be printed

Returns

ostream&

4.1.2.5 swap()

```
void swap (
            int & x,
            int & y )
```

Swap function.

Parameters

in	*x*	first value
in	*y*	second value

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