adas

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

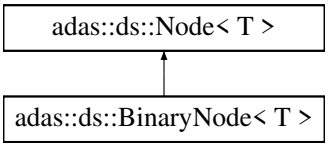
Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

Class Documentation

3.1 adas::ds::BinaryNode< T > Class Template Reference

Inheritance diagram for adas::ds::BinaryNode< T >:



Public Member Functions

- **BinaryNode** (T key)
- **BinaryNode** (T key, BinaryNode< T > *parent, NT type)
- **BinaryNode** (T key, BinaryNode< T > *parent, NT type, BinaryNode< T > *lchild_node, BinaryNode< T > *rchild_node)
- BinaryNode< T > * **get_parent** ()
- BinaryNode< T > * **get_child** (NT type)
- void **add_child** (BinaryNode< T > *child, NT type)

Protected Attributes

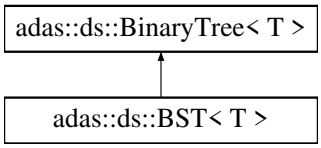
- BinaryNode< T > * **lchild**
- BinaryNode< T > * **rchild**

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

- include/adas/ds/binary_node.hpp

3.2 adas::ds::BinaryTree< T > Class Template Reference

Inheritance diagram for adas::ds::BinaryTree< T >:



Public Member Functions

- **BinaryTree** (T root_key)
- **BinaryTree** (T root_key, BinaryNode< T > *lchild, BinaryNode< T > *rchild)
- **BinaryTree** (BinaryNode< T > *root)
- list< BinaryNode< T > * > **get_children** (BinaryNode< T > *node)
- BinaryNode< T > * **get_root** ()
- BinaryNode< T > * **get_child** (BinaryNode< T > *node, NT type)
- BinaryNode< T > * **get_parent** (BinaryNode< T > *node)
- void **add_child** (BinaryNode< T > *node, BinaryNode< T > *child, NT type)
- bool **is_node** (BinaryNode< T > *node)

Protected Attributes

- BinaryNode< T > * **root**

Friends

- ostream & **operator**<< (ostream &out, BinaryTree< T > tree)

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

- include/adas/ds/binary_tree.hpp

3.3 adas::utilities::Boundaries< ForwardIterator > Struct Template Reference

Public Attributes

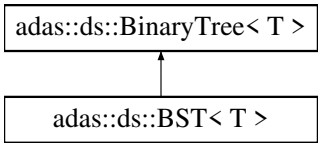
- ForwardIterator **init**
- ForwardIterator **end**

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

- include/adas/utilities/helper.hpp

3.4 adas::ds::BST< T > Class Template Reference

Inheritance diagram for adas::ds::BST< T >:



Public Member Functions

- **BST** (T root_key)
- **BST** (vector< T > keys)
- void **insert** (T key)
- BinaryNode< T > * **search** (T key)
- BinaryNode< T > * **search** (BinaryNode< T > *node, T key)

Static Public Member Functions

- static BinaryNode< T > * **search_parent** (BinaryNode< T > *node, BinaryNode< T > *leaf)

Additional Inherited Members

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

- include/adas/ds/bst.hpp

3.5 adas::ds::DGraphList< T > Class Template Reference

Public Member Functions

- **DGraphList** (std::initializer_list< T > key_vertices)

Protected Attributes

- DLList< SLList< DVertex< T > > > **vertices**

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

- include/adas/ds/directed_graph.hpp

3.6 adas::ds::DGraphMatrix< T > Class Template Reference

Public Member Functions

- **DGraphMatrix** (std::initializer_list< T > key_vertices)
- void **add_edge** (DVertex< T > init, DVertex< T > end, double weight)
- void **add_edge** (T init_key, T end_key)
- void **add_edge** (T init_key, T end_key, double weight)
- Matrix< double > **get_matrix** ()
- std::vector< DVertex< T > > **get_vertices** ()

Protected Attributes

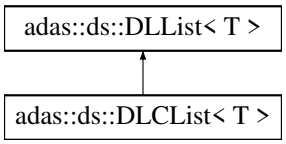
- std::vector< DVertex< T > > **vertices**
- Matrix< double > **mtx**

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

- include/adas/ds/directed_graph.hpp

3.7 adas::ds::DLCList< T > Class Template Reference

Inheritance diagram for adas::ds::DLCList< T >:



Public Member Functions

- **DLCList** (std::initializer_list< T > keys)
- DLNode< T > * **get_head** ()
- void **push_back** (DLNode< T > *node)
- void **push_back** (T key)

Friends

- template<class L >
  ostream & **operator**<< (ostream &out, DLCList< L > list)

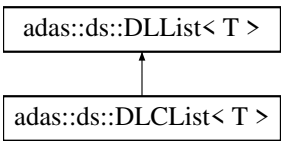
Additional Inherited Members

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

- include/adas/ds/doubly_linked_circular_list.hpp

3.8 adas::ds::DLList< T > Class Template Reference

Inheritance diagram for adas::ds::DLList< T >:



Classes

- class iterator

Public Member Functions

- **DLList** (unsigned int list_size, T default_key)
- **DLList** (unsigned int list_size)
- **DLList** (std::initializer_list< T > keys)
- **DLList** (std::vector< T > keys)
- DLList< T >::iterator **begin** ()
- DLList< T >::iterator **end** ()
- DLNode< T > * **get_head** ()
- DLNode< T > * **get_tail** ()
- unsigned int **get_size** ()
- DLList< T >::iterator **insert** (DLList< T >::iterator position, T key)
- DLList< T >::iterator **set_key** (DLList< T >::iterator position, T node_key)
- void **erase** (DLList< T >::iterator position)
- void **push_back** (DLNode< T > *node)
- void **push_front** (DLNode< T > *node)
- void **push_back** (T node_key)
- void **push_front** (T node_key)
- void **pop_front** ()
- void **pop_back** ()

Static Public Member Functions

- static void **copy_key** (DLList< T >::iterator node, DLList< T >::iterator other)
- static void **interchange_keys** (DLList< T >::iterator node, DLList< T >::iterator other_node)
- static void **bubble** (DLList< T >::iterator first, DLList< T >::iterator last, bool verbose=false)
- static void **bibubble** (DLList< T >::iterator first, DLList< T >::iterator last, bool verbose=false)
- static void **selection** (DLList< T >::iterator first, DLList< T >::iterator last, bool verbose=false)
- static void **insertion** (DLList< T >::iterator first, DLList< T >::iterator last, bool verbose=false)
- static DLList< T >::iterator **secuential_search** (DLList< T >::iterator first, DLList< T >::iterator last, T value)

Protected Attributes

- DLNode< T > * **head**
- DLNode< T > * **tail**
- DLNode< T > * **next2tail**
- unsigned int **size**

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

- include/adas/ds/doubly_linked_list.hpp

3.9 adas::ds::DLNode< T > Class Template Reference

Public Member Functions

- **DLNode** (T node_key)
- **DLNode** (T node_key, DLNode< T > *node, DLNT node_type)
- **DLNode** (T node_key, DLNode< T > *prev_node, DLNode< T > *next_node)
- void **_only_set_next** (DLNode< T > *next_node)
- void **_only_set_prev** (DLNode< T > *prev_node)
- void **set_next** (DLNode< T > *next_node)
- void **set_prev** (DLNode< T > *prev_node)
- void **set_key** (T node_key)
- bool **has_key** (T key)
- DLNode< T > * **get_node** ()
- DLNode< T > * **get_next** ()
- DLNode< T > * **get_prev** ()
- T **get_key** ()
- bool **operator<** (DLNode< T > node)
- bool **operator==** (DLNode< T > node)

Protected Attributes

- T **key**
- DLNode< T > * **next**
- DLNode< T > * **prev**

Friends

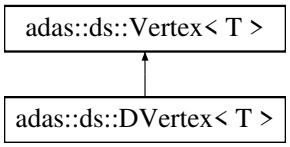
- template<class L >
  ostream & **operator<<** (ostream &out, DLNode< L > node)

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

- include/adas/ds/doubly_linked_node.hpp

3.10 adas::ds::DVertex< T > Class Template Reference

Inheritance diagram for adas::ds::DVertex< T >:



Public Member Functions

- **DVertex** (T vertex_key)
- void **set_indegree** (unsigned int vertex_indegree)
- void **set_outdegree** (unsigned int vertex_outdegree)
- unsigned int **get_indegree** ()
- unsigned int **get_outdegree** ()
- bool **operator==** (DVertex< T > v)

Protected Attributes

- unsigned int **indegree**
- unsigned int **outdegree**

Friends

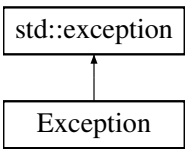
- std::ostream & **operator**<< (ostream &out, DVertex< T > v)

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

- include/adas/ds/directed_graph.hpp

3.11 Exception Class Reference

Inheritance diagram for Exception:



Public Member Functions

- **Exception** (string warning)
- const char * **what** () const throw ()

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

- include/adas/exceptions/general.hpp

3.12 adas::ds::Heap< T > Class Template Reference

Public Member Functions

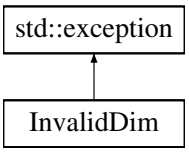
- **Heap** (vector< T > keys)
- unsigned int **get_nkeys** ()
- T **get_key** (unsigned int k)
- T **get_parent_key** (unsigned int k)
- void **set_key** (unsigned int k, T key)
- T **get_root** ()
- vector< T > **get_keys** ()
- void **interchange** (unsigned int k, unsigned int i)
- int **get_size** ()
- void **resize** (unsigned int heap_size)
- void **max_heapify** (int i, bool verbose)
- void **build_max_heap** (bool verbose)
- void **min_heapify** (int i, bool verbose)
- void **build_min_heap** (bool verbose)
- void **print_keys** ()

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

- include/adas/ds/heap.hpp

3.13 InvalidDim Class Reference

Inheritance diagram for InvalidDim:



Public Member Functions

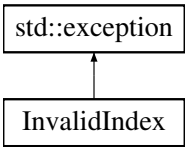
- **InvalidDim** (unsigned int nrows, unsigned int ncols, unsigned int size)
- **InvalidDim** (unsigned int nrows1, unsigned int ncols1, unsigned int nrows2, unsigned int ncols2)
- const char * **what** () const throw ()

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

- include/adas/ds/exceptions/matrix.hpp

3.14 InvalidIndex Class Reference

Inheritance diagram for InvalidIndex:



Public Member Functions

- **InvalidIndex** (int row_index, int col_index)
- const char * **what** () const throw ()

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

- include/adas/ds/exceptions/matrix.hpp

3.15 adas::ds::DLList< T >::iterator Class Reference

Public Types

- using **iterator_category** = std::bidirectional_iterator_tag
- using **value_type** = T
- using **difference_type** = std::ptrdiff_t
- using **pointer** = DLNode< T > *
- using **reference** = DLNode< T > &

Public Member Functions

- **iterator** (pointer node)
- reference **operator*** () const
- pointer **operator->** ()
- iterator & **operator--** ()
- iterator & **operator++** ()
- iterator **operator++** (int)
- iterator **operator--** (int)
- iterator & **get_this** ()
- iterator & **operator+** (unsigned int steps)
- iterator & **operator-** (unsigned int steps)
- iterator & **advance** (int steps)

Friends

- iterator & **next** (iterator itr)
- iterator & **prev** (iterator itr)
- bool **operator==** (const iterator &a, const iterator &b)
- bool **operator!=** (const iterator &a, const iterator &b)

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

- include/adas/ds/doubly_linked_list.hpp

3.16 adas::ds::SLList< T >::iterator Class Reference

Public Types

- using **iterator_category** = std::forward_iterator_tag
- using **value_type** = T
- using **difference_type** = std::ptrdiff_t
- using **pointer** = SLNode< T > *
- using **reference** = SLNode< T > &

Public Member Functions

- **iterator** (pointer node)
- reference **operator*** () const
- pointer **operator->** ()
- iterator & **operator++** ()
- iterator **operator++** (int)
- iterator & **get_this** ()
- iterator & **operator+** (unsigned int steps)

Friends

- iterator & **next** (iterator itr)
- iterator & **prev** (iterator itr)
- bool **operator==** (const iterator &a, const iterator &b)
- bool **operator!=** (const iterator &a, const iterator &b)

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

- include/adas/ds/single_linked_list.hpp

3.17 adas::ds::Matrix< T > Class Template Reference

Public Member Functions

- **Matrix** (unsigned int rows, unsigned int cols)
- **Matrix** (unsigned int rows, unsigned int cols, T value)
- **Matrix** (unsigned int rows, unsigned int cols, vector< T > values)
- void **set_value** (unsigned int row_index, unsigned int col_index, T value)
- unsigned int **get_nrows** ()
- unsigned int **get_ncols** ()
- vector< T > **get_row** (unsigned int index)
- vector< T > **get_col** (unsigned int index)
- T **operator()** (unsigned int row, unsigned int col)
- Matrix< T > **operator+** (Matrix< T > mtx)
- Matrix< T > **operator-** (Matrix< T > mtx)

Protected Attributes

- vector< vector< T > > * **data**
- unsigned int **nrows**
- unsigned int **ncols**

Friends

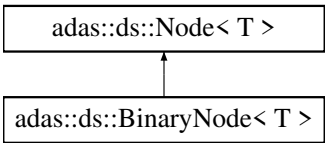
- template<typename L >
  ostream & **operator**<< (ostream &out, Matrix< L > mtx)

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

- include/adas/ds/matrix.hpp

3.18 adas::ds::Node< T > Class Template Reference

Inheritance diagram for adas::ds::Node< T >:



Public Member Functions

- **Node** (T key)
- **Node** (T key, Node< T > *parent)
- **Node** (T key, Node< T > *parent, list< Node< T > * > children)
- T **get_key** ()
- Node< T > * **get_parent** ()
- void **set_depth** (unsigned int tree_depth)
- list< Node< T > * > **get_children** ()
- unsigned int **get_depth** ()
- void **add_child** (Node< T > *child)
- void **set_parent** (Node< T > *parent)
- bool **equal_children** (Node< T > *node)
- bool **is_equal** (Node< T > *node)
- bool **operator==** (Node< T > node)
- bool **has_child** (Node< T > *node)

Protected Attributes

- T **key**
- unsigned int **depth**
- unsigned int **height**
- Node< T > * **parent**
- list< Node< T > * > **children**

Friends

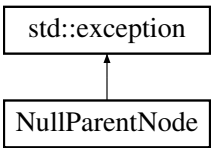
- ostream & **operator**<< (ostream &out, Node< T > node)

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

- include/adas/ds/node.hpp

3.19 NullParentNode Class Reference

Inheritance diagram for NullParentNode:



Public Member Functions

- const char * **what** () const throw ()

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

- include/adas/ds/exceptions/node.hpp

3.20 adas::ds::Partition< T > Class Template Reference

Public Member Functions

- **Partition** (vector< T > pivots, vector< T > elements)
- unsigned int **get_nelems** ()
- unsigned int **size** ()
- vector< T > **get_pivots** ()
- vector< vector< T > > * **get_parts** ()
- vector< T > **join** ()
- void **show** ()
- vector< T > **get_part** (unsigned int k)
- void **set_part** (unsigned int k, vector< T > new_part)

Static Public Member Functions

- static vector< vector< T > > * **generate** (vector< T > pivots, vector< T > elements)

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

- include/adas/ds/partition.hpp

3.21 adas::ds::Queue< T > Class Template Reference

Public Member Functions

- **Queue** (int queue_max_size)
- void **put** (SLNode< T > *node)
- void **put** (T value)
- SLNode< T > * **get** ()
- SLNode< T > * **_get_head** ()
- int **get_maximum_size** ()

Friends

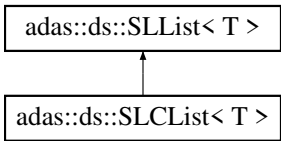
- ostream & **operator**<< (ostream &out, Queue< T > queue)

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

- include/adas/ds/queue.hpp

3.22 adas::ds::SLCList< T > Class Template Reference

Inheritance diagram for adas::ds::SLCList< T >:



Public Member Functions

- **SLCList** (std::initializer_list< T > keys)
- SLNode< T > * **get_head** ()
- void **push_back** (SLNode< T > *node)
- void **push_back** (T key)

Friends

- template<class L >
  ostream & **operator**<< (ostream &out, SLCList< L > list)

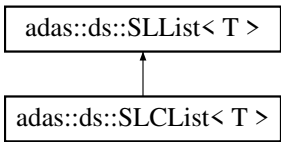
Additional Inherited Members

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

- include/adas/ds/single_linked_circular_list.hpp

3.23 adas::ds::SLList< T > Class Template Reference

Inheritance diagram for adas::ds::SLList< T >:



Classes

- class iterator

Public Member Functions

- **SLList** (unsigned int list_size, T default_key)
- **SLList** (unsigned int list_size)
- **SLList** (std::initializer_list< T > keys)
- **SLList** (std::vector< T > keys)
- SLList< T >::iterator **begin** ()
- SLList< T >::iterator **end** ()
- SLList< T >::iterator **set_key** (SLList< T >::iterator position, T node_key)
- SLNode< T > * **get_head** ()
- SLNode< T > * **get_tail** ()
- unsigned int **get_size** ()
- SLList< T >::iterator **get_prev** (iterator position)
- SLNode< T > * **get_prev_node** (SLList< T >::iterator position)
- SLList< T >::iterator **insert** (SLList< T >::iterator position, T key)
- void **erase** (SLList< T >::iterator position)
- void **push_back** (SLNode< T > *node)
- void **push_front** (SLNode< T > *node)
- void **push_back** (T node_key)
- void **push_front** (T node_key)
- void **pop_front** ()
- void **pop_back** ()

Static Public Member Functions

- static void **interchange_keys** (SLList< T >::iterator node, SLList< T >::iterator other_node)
- static void **bubble** (SLList< T >::iterator first, SLList< T >::iterator last, bool verbose=false)
- static void **selection** (SLList< T >::iterator first, SLList< T >::iterator last, bool verbose=false)
- static SLList< T >::iterator **secuential_search** (SLList< T >::iterator first, SLList< T >::iterator last, T value)

Protected Attributes

- SLNode< T > * **head**
- SLNode< T > * **tail**
- SLNode< T > * **next2tail**
- unsigned int **size**

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

- include/adas/ds/single_linked_list.hpp

3.24 adas::ds::SLNode< T > Class Template Reference

Public Member Functions

- **SLNode** (T node_key)
- **SLNode** (T node_key, SLNode< T > *next_node)
- void **set_next** (SLNode< T > *next_node)
- void **set_key** (T node_key)
- SLNode< T > * **get_next** ()
- SLNode< T > * **get_node** ()
- T **get_key** ()
- bool **has_key** (T node_key)
- bool **operator<** (SLNode< T > node)
- bool **operator==** (SLNode< T > node)

Protected Attributes

- T **key**
- SLNode< T > * **next**

Friends

- template<class L >
  ostream & **operator**<< (ostream &out, SLNode< L > node)

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

- include/adas/ds/single_linked_node.hpp

3.25 adas::ds::Stack< T > Class Template Reference

Public Member Functions

- **Stack** (T keys[ ], unsigned size)
- **Stack** (vector< T > keys)
- void **push** (T key)
- void **pop** ()

Protected Attributes

- vector< T > **keys**
- unsigned int **size**

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

- include/adas/ds/stack.hpp

3.26 adas::utilities::TimePoints Struct Reference

Public Attributes

- high_resolution_clock::time_point **start**
- high_resolution_clock::time_point **end**

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

- include/adas/utilities/timer.hpp

3.27 adas::utilities::Timer Class Reference

Public Member Functions

- void **start** ()
- void **restart** ()
- void **stop** ()
- void **report** (string title)
- void **default_report** ()

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

- include/adas/utilities/timer.hpp

3.28 adas::ds::UDGraphMatrix< T > Class Template Reference

Public Member Functions

- **UDGraphMatrix** (std::initializer_list< T > key_vertices)
- void **add_edge** (Vertex< T > init, Vertex< T > end, double weight)
- void **add_edge** (T init_key, T end_key)
- void **add_edge** (T init_key, T end_key, double weight)
- Matrix< double > **get_matrix** ()
- std::vector< Vertex< T > > **get_vertices** ()

Protected Attributes

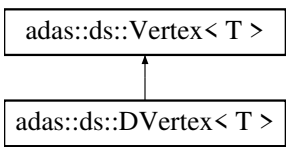
- std::vector< Vertex< T > > **vertices**
- Matrix< double > **mtx**

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

- include/adas/ds/undirected_graph.hpp

3.29 adas::ds::Vertex< T > Class Template Reference

Inheritance diagram for adas::ds::Vertex< T >:



Public Member Functions

- **Vertex** (T vertex_key)
- T **get_key** ()
- unsigned int **get_degree** ()
- void **set_degree** (unsigned int vertex_degree)
- bool **operator==** (Vertex< T > v)

Protected Attributes

- T **key**
- unsigned int **degree**

Friends

- std::ostream & **operator**<< (std::ostream &out, Vertex v)

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

- include/adas/ds/vertex.hpp

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