RouteFinder

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Contents

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

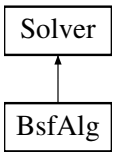
Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

Class Documentation

3.1 BsfAlg Class Reference

Inheritance diagram for BsfAlg:



Public Member Functions

- virtual Route ∗ solve (const Network ∗n, Node ∗start, Node ∗end, Time t)
- virtual const std::string & **getName** () const

3.1.1 Member Function Documentation

3.1.1.1 Route ∗ BsfAlg::solve (const Network ∗ *n*, Node ∗ *start*, Node ∗ *end*, Time *t*) [virtual]

Method used in Network class for finding best connection between points. This method need to be implemented in any class inheriting from Solver class.

Parameters

n	Pointer to Network in which Route is being searched for.

Returns

Pointer to found Route, NULL if no route can be found.

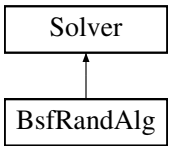
Implements Solver.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/BSF.h
- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/BSF.cpp

3.2 BsfRandAlg Class Reference

Inheritance diagram for BsfRandAlg:



Public Member Functions

- virtual Route ∗ solve (const Network ∗n, Node ∗start, Node ∗end, Time t)
- virtual const std::string & **getName** () const

3.2.1 Member Function Documentation

3.2.1.1 Route ∗ BsfRandAlg::solve (const Network ∗ *n*, Node ∗ *start*, Node ∗ *end*, Time *t*) [virtual]

Method used in Network class for finding best connection between points. This method need to be implemented in any class inheriting from Solver class.

Parameters

n	Pointer to Network in which Route is being searched for.

Returns

Pointer to found Route, NULL if no route can be found.

Implements Solver.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/BSFR.h
- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/BSFR.cpp

3.3 Connection Class Reference

Public Member Functions

- Connection ()
- Connection (Time departureTime, Time arrivalTime, unsigned int tripId)
- Connection (const Connection &con)
- Connection & operator= (const Connection &con)
- Time getDepartureTime () const
- Time getArrivalTime () const
- unsigned int getTripID () const

Friends

- std::ostream & operator<< (std::ostream &output, Connection con)

3.3.1 Constructor & Destructor Documentation

3.3.1.1 Connection::Connection ( )

Default constructor which makes connection with zero id and times

3.3.1.2 Connection::Connection (Time *departureTime,* Time *arrivalTime,* unsigned int *tripId*)

Constructor

Parameters

departureTime	time when bus leaves starting stop
arrivalTime	time when bus goes on ending stop
tripId	trip of bus

3.3.1.3 Connection::Connection (const Connection & *con*)

Consturctor which copies object

Parameters

con	object to copy

3.3.2 Member Function Documentation

3.3.2.1 Time Connection::getArrivalTime ( ) const

get arrival time

Returns

time when bus goes on ending stop

3.3.2.2 Time Connection::getDepartureTime ( ) const

get departue time

Returns

time when bus leaves starting stop

3.3.2.3 unsigned int Connection::getTripID ( ) const

get id of trip which makes connectio

Returns

id of trip

3.3.2.4 Connection & Connection::operator= (const Connection & *con*)

Assign one object to another

Parameters

con	object to copy

Returns

object which was coppied in

3.3.3 Friends And Related Function Documentation

3.3.3.1 std::ostream& operator<< (std::ostream & *output,* Connection *con*) [friend]

print connection to stream

Parameters

output	stream where information will be print to object to printing stream where object were printed

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Connection.h
- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Connection.cpp

3.4 DataBase Class Reference

`#include <DataBase.h>`

Public Types

- enum LoadMethod {
  JSON = 0, **GTFS** = 1, **MULTJSON** = 2, **SAVEDDB** = 3,
  EMPTY = 4 }

Public Member Functions

- DataBase (DataBase::LoadMethod method, std::string path)
- bool isValid ()
- void **saveToFile** (const std::string p) const

Public Attributes

- std::vector< RouteData > routes
- std::vector< TripData > trips
- std::vector< StopData > stops
- std::vector< StopTimeData > stopTimes
- std::vector< ServiceData > services
- std::vector< std::vector< std::vector< Time > > > **timeTable**

3.4.1 Detailed Description

Database class, used to loading from files and then being converted into Network object. Provides input from gtfs or json formats.

3.4.2 Member Enumeration Documentation

3.4.2.1 enum DataBase::LoadMethod

Enum defining loading method being used.

3.4.3 Constructor & Destructor Documentation

3.4.3.1 DataBase::DataBase (DataBase::LoadMethod *method,* std::string *path*)

Constructor.

Parameters

method	Defines load method being used.
path	Provides path to files being loaded. If one file is being used it needs to get path to file, otherwise - to directory containing files.

3.4.4 Member Function Documentation

3.4.4.1 bool DataBase::isValid ( )

Method checking validity of loaded database.

Returns

true if all vectors got populated with data, false otherwise.

3.4.5 Member Data Documentation

3.4.5.1 std::vector<RouteData> DataBase::routes

std::vector object containing loaded RouteData.

3.4.5.2 std::vector<ServiceData> DataBase::services

std::vector object containing loaded ServiceData.

3.4.5.3 std::vector<StopData> DataBase::stops

std::vector object containing loaded StopData.

3.4.5.4 std::vector<StopTimeData> DataBase::stopTimes

std::vector object containing loaded StopTimeData.

3.4.5.5 std::vector<TripData> DataBase::trips

std::vector object containing loaded TripData.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/DataBase.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/DataBase.cpp

3.5 DataReader Class Reference

`#include <DataReader.h>`

Static Public Member Functions

- static std::vector< RouteData > readRoutes (std::string filename, bool oneFile=true)
- static std::vector< StopData > readStops (std::string filename, bool oneFile=true)
- static std::vector< TripData > readTrips (std::string filename, bool oneFile=true)
- static std::vector< StopTimeData > readStopTimes (std::string filename, bool oneFile=true)
- static std::vector< ServiceData > readServices (std::string filename, bool oneFile=true)

3.5.1 Detailed Description

DataReader reads data from one or multiple json files. If oneFile is set, functions assume that whole database is contained in given file, otherwise, assume given file contains only neccesary data and so std::vector sth = root; (no root['sth'] is needed.)

3.5.2 Member Function Documentation

3.5.2.1 std::vector< RouteData > DataReader::readRoutes (std::string *filename*, bool *oneFile* = `true`) [static]

Function loading routes from given file.

Parameters

filename	path to file.
oneFile	Defines if all data is being loaded from oneFile.

Returns

vector containing RouteData.

3.5.2.2 std::vector< ServiceData > DataReader::readServices (std::string *filename*, bool *oneFile* = `true`) [static]

Function loading services from given file.

Parameters

filename	path to file.
oneFile	Defines if all data is being loaded from oneFile.

Returns

vector containing ServiceData.

3.5.2.3 std::vector< StopData > DataReader::readStops (std::string *filename*, bool *oneFile* = `true`) [static]

Function loading stops from given file.

Parameters

filename	path to file.
oneFile	Defines if all data is being loaded from oneFile.

Returns

vector containing StopData.

3.5.2.4 std::vector< StopTimeData > DataReader::readStopTimes (std::string *filename*, bool *oneFile* = `true`) [static]

Function loading stop times from given file.

Parameters

filename	path to file.
oneFile	Defines if all data is being loaded from oneFile.

Returns

vector containing StopTimeData.

3.5.2.5 std::vector< TripData > DataReader::readTrips (std::string *filename*, bool *oneFile* = `true`) [static]

Function loading trips from given file.

Parameters

filename	path to file.
oneFile	Defines if all data is being loaded from oneFile.

Returns

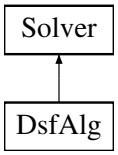
vector containing TripData.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/DataReader.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/DataReader.cpp

3.6 DsfAlg Class Reference

Inheritance diagram for DsfAlg:



Public Member Functions

- virtual Route ∗ solve (const Network ∗n, Node ∗start, Node ∗end, Time t)
- virtual const std::string & **getName** () const

3.6.1 Member Function Documentation

3.6.1.1 Route * DsfAlg::solve (const Network * *n*, Node * *start*, Node * *end*, Time *t*) [virtual]

Method used in Network class for finding best connection between points. This method need to be implemented in any class inheriting from Solver class.

Parameters

n	Pointer to Network in which Route is being searched for.

Returns

Pointer to found Route, NULL if no route can be found.

Implements Solver.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/DSF.h
- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/DSF.cpp

3.7 Edge Class Reference

Public Member Functions

- Edge (unsigned int id, Node *start, Node *end)
- **Edge** (const Edge &e)
- unsigned int getID () const
- Node * getStartNode () const
- Node * getEndNode () const
- bool operator== (const Edge &e) const
- bool operator!= (const Edge &e) const
- bool operator< (const Edge &e) const
- Edge & operator= (const Edge &e)
- void **addConnection** (Time departureTime, Time arrivalTime, unsigned int tripId)
- Time **getNextTime** (Time t) const

Public Attributes

- std::vector< Connection > **connections**

Friends

- std::ostream & operator<< (std::ostream &s, const Edge &e)

3.7.1 Constructor & Destructor Documentation

3.7.1.1 Edge::Edge (unsigned int *id*, Node * *start*, Node * *end*)

Constructor of Edge object.

Parameters

id	Identificator of object.
start	Pointer to Node assigned as starting position.
end	Pointer to Node assigned as ending position.
weight	Given weight.
type	Enumerated value describing type of route.

3.7.2 Member Function Documentation

3.7.2.1 Node * Edge::getEndNode ( ) const

Returns

Returns pointer to ending Node.

3.7.2.2 unsigned int Edge::getID ( ) const

Returns

Returns id of itself.

3.7.2.3 Node * Edge::getStartNode ( ) const

Returns

Returns pointer to starting Node.

3.7.2.4 bool Edge::operator!= (const Edge & *e*) const

Compares itself id with given edge id.

Parameters

e	Given Edge.

Returns

True if ids are not equal, false otherwise.

3.7.2.5 bool Edge::operator< (const Edge & *e*) const

Compares itself id with given edge id. Method used in Network class.

Parameters

e	Given Edge.

Returns

True if this->id is smaller than e.id, false otherwise.

3.7.2.6 Edge & Edge::operator= (const Edge & *e*)

Assign operator.

Parameters

e	Given Edge.

Returns

Reference to itself.

3.7.2.7 bool Edge::operator== (const Edge & *e*) const

Compares itself id with given edge id.

Parameters

e	Given Edge.

Returns

True if ids are equal, false otherwise.

3.7.3 Friends And Related Function Documentation

3.7.3.1 std::ostream& operator<< (std::ostream & *s,* const Edge & *e*) [friend]

Operator used for console debug purposes.

Parameters

s	Stream which is used for output.
e	Edge on which operator is called.

Returns

Given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Edge.h
- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Edge.cpp

3.8 edgePointerCompare Struct Reference

`#include <Network.h>`

Public Member Functions

- bool **operator()** (Edge ∗e1, Edge ∗e2) const

3.8.1 Detailed Description

main class, contains information about nodes and edges between them. Should be created from file containing data in GTFS or other format. loadFromFile method should load "db/db.ext" file and save it to inner variables.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Network.h

3.9 GTFSReader Class Reference

`#include <GTFSReader.h>`

Public Member Functions

- void readGTFS (std::string filename)
- std::vector< RouteData > getRoutes ()
- std::vector< StopData > getStops ()
- std::vector< TripData > getTrips ()
- std::vector< StopTimeData > getStopTimes ()
- std::vector< ServiceData > getServices ()

Friends

- std::ostream & operator<< (std::ostream &stream, const GTFSReader &reader)

3.9.1 Detailed Description

GTFSReader reads data from GTFS format zip archive. It is compatible with DataReader class.

3.9.2 Member Function Documentation

3.9.2.1 std::vector< RouteData > GTFSReader::getRoutes ( )

Returns

vector containing RouteData.

3.9.2.2 std::vector< ServiceData > GTFSReader::getServices ( )

Returns

vector containing ServiceData.

3.9.2.3 std::vector< StopData > GTFSReader::getStops ( )

Returns

vector containing StopData.

3.9.2.4 std::vector< StopTimeData > GTFSReader::getStopTimes ( )

Returns

vector containing StopTimeData.

3.9.2.5 std::vector< TripData > GTFSReader::getTrips ( )

Returns

vector containing TripData.

3.9.2.6 void GTFSReader::readGTFS (std::string *filename*)

Unpacks gtfs archive, creates network, deletes created in progress files.

Parameters

filename	Path to gtfs file.

3.9.3 Friends And Related Function Documentation

3.9.3.1 std::ostream& operator<< (std::ostream & *stream,* const GTFSReader & *reader*) [friend]

Helper output function.

Parameters

stream	Stream
reader	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/GTFSReader.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/GTFSReader.cpp

3.10 Network Class Reference

Public Member Functions

- Network ()
- ~Network ()
- Network (DataBase &dataB)
- void setSolver (Solver *s)
- Route * findRouteBetween (Node *start, Node *end, Time t)
- std::list< Node * > getAllNodes () const
- std::list< Edge * > getAllEdges () const
- bool isEdgeBetween (const Node *start, const Node *end) const
- Node * getNode (unsigned int id) const
- Edge * getEdge (unsigned int id) const
- std::list< Edge * > getEdgesForNode (const Node *n) const
- Node * getNodeCloseToPos (double latitude, double longtitude) const
- unsigned int **calculateEdgeId** (unsigned int startId, unsigned int endId) const
- bool **validate** ()

Static Public Member Functions

- static Network * **generateRandomNetwork** (unsigned width, unsigned height, long seed=0, double probability=1)

Public Attributes

- bool ** incidenceMatrix

Friends

- std::ostream & operator<< (std::ostream &s, const Network &n)

3.10.1 Constructor & Destructor Documentation

3.10.1.1 Network::Network ( )

Network object constructor. If this constructor is called, loadFromFile method need to be called after.

3.10.1.2 Network::~Network ( )

Network object constructor in which Network::loadFromFile() method is being called.

Parameters

f	Name of file from which database is loaded. Destructs all objects in Network and itself.

3.10.1.3 Network::Network (DataBase & *dataB*)

Creates Network from database

3.10.2 Member Function Documentation

3.10.2.1 Route * Network::findRouteBetween (Node * *start*, Node * *end*, Time *t*)

Searches for Route beetween two given points.

Parameters

start	Start Node.
end	End Node.

Returns

Pointer to Route between given nodes, NULL if no route can be found.

3.10.2.2 std::list< Edge * > Network::getAllEdges ( ) const

For debug.

Returns

Returns some kind of stl container in which all edges are stored.

3.10.2.3 std::list< Node * > Network::getAllNodes ( ) const

This function is necessary for GUI.

Returns

Returns some kind of stl container in which all nodes are stored in alphabetical order.

3.10.2.4 Edge * Network::getEdge (unsigned int *id*) const

Parameters

id	Id of desired Edge.

Returns

Pointer to desired Edge if exists in graph, NULL otherwise.

3.10.2.5 std::list< Edge * > Network::getEdgesForNode (const Node * *n*) const

Parameters

n	Pointer to given Node.

Returns

std::list of all Edges starting in given Node.

3.10.2.6 Node * Network::getNode (unsigned int *id*) const

Parameters

id	Id of desired Node.

Returns

Pointer to desired Node if exists in graph, NULL otherwise.

3.10.2.7 Node * Network::getNodeCloseToPos (double *latitude*, double *longtitude*) const

Parameters

latitude	Given latitude
longtitude	Given longtitude.

Returns

Returns pointer to Node being closest to given geographic position.

3.10.2.8 bool Network::isEdgeBetween (const Node * *start*, const Node * *end*) const

Parameters

start	Pointer to starting Node.
end	Pointer to ending Node.

Returns

True if Edge from start to end exists in graph, false otherwise.

3.10.2.9 void Network::setSolver (Solver * *s*)

Set solved used in Network::findRouteBetween() method.

Parameters

s	Pointer to Solver being used.

3.10.3 Friends And Related Function Documentation

3.10.3.1 std::ostream& operator<< (std::ostream & *s*, const Network & *n*) [friend]

Used of debug in console purposes.

Parameters

s	Stream used for output.
n	Reference to Network being printed.

Returns

Given stream.

3.10.4 Member Data Documentation

3.10.4.1 bool** Network::incidenceMatrix

two dimensional bool array containing data about connections for matrix[i][j], true means there is connection between node.id == i to node.id ==j.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Network.h
- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Network.cpp

3.11 Node Class Reference

Public Member Functions

- Node (unsigned int id, std::string name, double lon, double lat)
- double getLongtitude () const
- double getLatitude () const
- unsigned int getID () const
- std::string getName () const
- std::list< Edge * > **getEdges** () const
- bool **addEdge** (Edge *e)
- bool operator== (const Node &n) const
- bool operator!= (const Node &n) const
- bool operator< (const Node &n) const
- Node & operator= (const Node &n)

Friends

- std::ostream & operator<< (std::ostream &s, const Node &n)

3.11.1 Constructor & Destructor Documentation

3.11.1.1 Node::Node (unsigned int *id,* std::string *name,* double *lon,* double *lat*)

Constructs new Node object.

Parameters

id	Id of an node.
name	Name of node (stop).
lon	Longtitude coord.
lat	Latitude coord.

3.11.2 Member Function Documentation

3.11.2.1 unsigned int Node::getID ( ) const

Returns

Returns id of itself.

3.11.2.2 double Node::getLatitude ( ) const

Returns

Returns latutide as double.

3.11.2.3 double Node::getLongtitude ( ) const

Returns

Returns longtitude as double.

3.11.2.4 std::string Node::getName ( ) const

Returns

Returns string containing name.

3.11.2.5 bool Node::operator!= (const Node & *n*) const

Operator compares id of this and given node.

Parameters

n	Node which is being compared.

Returns

False if ids are equal, true otherwise.

3.11.2.6 bool Node::operator< (const Node & *n*) const

Operator used in sets in Network class. Compares ids.

Parameters

n	Node which is being compared.

Returns

True if this->id is smaller than n.id, false otherwise.

3.11.2.7 Node & Node::operator= (const Node & *n*)

Copies params from given Node to itself.

Parameters

n	Node which is being copied.

Returns

Reference to itself.

3.11.2.8 bool Node::operator== (const Node & *n*) const

Operator compares id of this and given node.

Parameters

n	Node which is being compared.

Returns

True if ids are equal, false otherwise.

3.11.3 Friends And Related Function Documentation

3.11.3.1 std::ostream& operator<< (std::ostream & *s*, const Node & *n*) [friend]

Operator used for console debug purposes.

Parameters

s	Stream which is used for output.
n	Node on which operator is called.

Returns

Given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Node.h
- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Node.cpp

3.12 nodePointerCompare Struct Reference

Public Member Functions

- bool **operator()** (Node *n1, Node *n2) const

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Network.h

3.13 Route Class Reference

`#include <Route.h>`

Public Member Functions

- Route ()
- **Route** (const Route &r)
- unsigned int getLength () const
- unsigned int getWeight (Time t) const
- bool validate () const
- bool addEdge (const Edge *e)
- bool switchEdge (const Edge *e)
- bool switchRoute (Route &r)
- const Node * getStartNode () const
- const Node * getEndNode () const
- bool isNodeIn (const Node *n) const
- bool isEdgeIn (const Edge *e) const
- bool isConnectionBetween (const Node *start, const Node *end) const
- std::list< const Edge * >::iterator begin ()
- std::list< const Edge * >::iterator end ()
- std::vector< Connection > getConnectionsSequence (Time t) const
- unsigned int getChangeNumber (Time t) const

Static Public Member Functions

- static void printRoute (std::ostream &output, Route *r, Time t)

Friends

- std::ostream & operator<< (std::ostream &s, Route &r)

3.13.1 Detailed Description

contains information about route between two points Should be used in solver class.

3.13.2 Constructor & Destructor Documentation

3.13.2.1 Route::Route ( )

Constructs object. No data is necessary.

3.13.3 Member Function Documentation

3.13.3.1 bool Route::addEdge (const Edge * *e*)

Add one Edge to the end of Route. Given edge must start in Node, in which current route ends.

Parameters

e	Pointer to given edge.

Returns

True if edge could be connected to route, false otherwise.

3.13.3.2 std::list< const Edge * >::iterator Route::begin ( )

Returns

Returns iterator to the begining of route.

3.13.3.3 std::list< const Edge * >::iterator Route::end ( )

Returns

Returns iterator to point after last Edge in route.

3.13.3.4 unsigned int Route::getChangeNumber (Time *t*) const

calculate how many times we have to change trip while traveling this route

Parameters

t	time when route starts

Returns

number of changes

3.13.3.5 std::vector< Connection > Route::getConnectionsSequence (Time *t*) const

Returns connection sequence on witch getWeight(Time) calculate result

Parameters

t	Time when calculating starts from

Returns

vector with found connections

3.13.3.6 const Node * Route::getEndNode ( ) const

Returns

pointer to Node on the end of Route.

3.13.3.7 unsigned int Route::getLength ( ) const

Returns

Returns length - number of Edge objects.

3.13.3.8 const Node * Route::getStartNode ( ) const

Returns

Returns pointer to Node on the begining of Route.

3.13.3.9 unsigned int Route::getWeight (Time *t*) const

Returns

Returns sum of weights of Edge objects.

3.13.3.10 bool Route::isConnectionBetween (const Node * *start*, const Node * *end*) const

Checks for subroute between given nodes.

Parameters

start	Pointer to Node of start.
end	Pinter to Node of end.

Returns

True if there is subroute from start to end in route, false otherwise.

3.13.3.11 bool Route::isEdgeIn (const Edge * *e*) const

Parameters

e	Pointer to Edge which is being searched for.

Returns

True if Edge is included in route, false otherwise.

3.13.3.12 bool Route::isNodeIn (const Node * *n*) const

Parameters

n	Pointer to Node which is being checked.

Returns

True if given node is currently in route. False otherwise.

3.13.3.13 void Route::printRoute (std::ostream & *output*, Route * *r*, Time *t*) [static]

prints route in "sophisticated" way

Parameters

output	stream to print route in
r	route to print
t	time when route starts

3.13.3.14 bool Route::switchEdge (const Edge * e)

Switches given edge with one included in path,

Parameters

e	Pointer to Edge. Its start Node and end Node must be same as start and end nodes of edge included in route.

Returns

True if switch was successful, false otherwise.

3.13.3.15 bool Route::switchRoute (Route & r)

Switches part of Route with given route.

Parameters

r	Reference to subroute which needs to be inserted into object. It must to be correct (validate method is being called), and start and end of subroute must have corresponding values as start and end of some subroute inside current object. Length of switched subroutes do not need to be equal.

Returns

True if switch was successful, false otherwise.

3.13.3.16 bool Route::validate ( ) const

Checks if Route does not contain any loops and if all edges are connected. I.e. A->B and then B->C is ok, but A->B and C->D is wrong.

Returns

True if test is passed, false otherwise.

3.13.4 Friends And Related Function Documentation

3.13.4.1 std::ostream& operator<< (std::ostream & s, Route & r) [friend]

Used of debug in console purposes.

Parameters

s	Stream used for output.

r	Reference to Route being printed.

Returns

Given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Route.h
- /home/vka/Programming/C/workspace/RouteFinder/src/graph/Route.cpp

3.14 RouteData Class Reference

`#include <RouteData.h>`

Public Member Functions

- RouteData ()
- RouteData (const RouteData &src)
- RouteData (std::string name, unsigned int id)
- ~RouteData ()
- RouteData & operator= (const RouteData &src)
- bool operator== (const RouteData &src)
- std::string getName () const
- unsigned int getId () const

Friends

- std::ostream & operator<< (std::ostream &output, const RouteData &src)

3.14.1 Detailed Description

Class containing data about routes when database is being created. Then converted into Route object.

3.14.2 Constructor & Destructor Documentation

3.14.2.1 RouteData::RouteData ( )

Default constructor.

3.14.2.2 RouteData::RouteData (const RouteData & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.14.2.3 RouteData::RouteData (std::string *name*, unsigned int *id*)

Constructor.

Parameters

name	Name of route.
id	id of route.

3.14.2.4 RouteData::~RouteData ( )

Destructor.

3.14.3 Member Function Documentation

3.14.3.1 unsigned int RouteData::getId ( ) const

Returns

return id value.

3.14.3.2 std::string RouteData::getName ( ) const

Returns

Returns name value.

3.14.3.3 RouteData & RouteData::operator= (const RouteData & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.14.3.4 bool RouteData::operator== (const RouteData & *src*)

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if name and is are equal.

3.14.4 Friends And Related Function Documentation

3.14.4.1 std::ostream& operator<< (std::ostream & *output,* const RouteData & *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/RouteData.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/RouteData.cpp

3.15 ServiceData Class Reference

`#include <ServiceData.h>`

Public Member Functions

- ServiceData ()
- ServiceData (const ServiceData &src)
- ServiceData (unsigned int id, std::string name, unsigned operationalDays)
- ~ServiceData ()
- ServiceData & operator= (const ServiceData &src)
- bool operator== (const ServiceData src)
- unsigned int getId ()
- std::string getName ()
- unsigned getDays ()

Friends

- std::ostream & operator<< (std::ostream &output, const ServiceData &src)

3.15.1 Detailed Description

Class containing data about services when database is being created.

3.15.2 Constructor & Destructor Documentation

3.15.2.1 ServiceData::ServiceData ( )

Default constructor.

3.15.2.2 ServiceData::ServiceData (const ServiceData & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.15.2.3 ServiceData::ServiceData (unsigned int *id,* std::string *name,* unsigned *operationalDays*)

Constructor.

Parameters

name	Name of route.
id	id of route.

3.15.2.4 ServiceData::~ServiceData ( )

Destructor.

3.15.3 Member Function Documentation

3.15.3.1 unsigned ServiceData::getDays ( )

Returns

return days value.

3.15.3.2 unsigned int ServiceData::getId ( )

Returns

Returns id value.

3.15.3.3 std::string ServiceData::getName ( )

Returns

return name value.

3.15.3.4 ServiceData & ServiceData::operator= (const ServiceData & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.15.3.5 bool ServiceData::operator== (const ServiceData *src*)

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if name and is are equal.

3.15.4 Friends And Related Function Documentation

3.15.4.1 std::ostream& operator<< (std::ostream & *output,* const ServiceData & *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

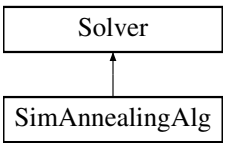
The documentation for this class was generated from the following files:

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/ServiceData.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/ServiceData.cpp

3.16 SimAnnealingAlg Class Reference

`#include <SimAnnealingAlg.h>`

Inheritance diagram for SimAnnealingAlg:



Public Member Functions

- **SimAnnealingAlg** (long long seed)
- virtual Route * solve (const Network *n, Node *start, Node *end, Time t)
- void **setParams** (double Tstart, double Tend, unsigned int k, double alpha, unsigned int allowedChange↩ Number, unsigned int changePunishment)
- virtual const std::string & **getName** () const
- std::vector< unsigned > **getWeights** () const
- std::vector< unsigned > **getPunishments** () const
- std::vector< unsigned > **getBestPosWeights** () const
- void **setSeed** (long long seed)

3.16.1 Detailed Description

Simulated Annealing Algorithm used for finding routes. See doc folder for more information.

3.16.2 Member Function Documentation

3.16.2.1 Route * SimAnnealingAlg::solve (const Network * *n*, Node * *start*, Node * *end*, Time *t*) [virtual]

Method used in Network class for finding best connection between points.

Parameters

n	Pointer to Network in which Route is being searched for.

Returns

Pointer to found Route, NULL if no route can be found.

Implements Solver.

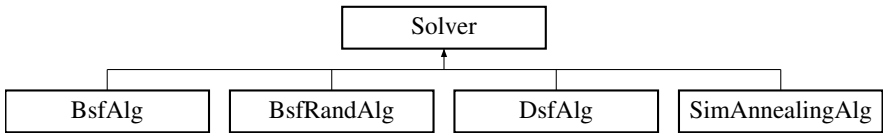
The documentation for this class was generated from the following files:

- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/SimAnnealingAlg.h
- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/SimAnnealingAlg.cpp

3.17 Solver Class Reference

`#include <Solver.h>`

Inheritance diagram for Solver:



Public Member Functions

- virtual Route * solve (const Network *n, Node *start, Node *end, Time t)=0
- virtual const std::string & **getName** () const =0

3.17.1 Detailed Description

wrapper class for solver algorithm. Those shall inherit from Solver class. Solver needs to implement solve method, which gets Network map as

USAGE: int main() { Solver * solver; solver = new SimAnnealingAlg; solver->setParams(...); Network net = new Network; ... net.setSolver(solver); //in Network: // this->solver->solve(); }

3.17.2 Member Function Documentation

3.17.2.1 virtual Route* Solver::solve (const Network * *n*, Node * *start*, Node * *end*, Time *t*) [pure virtual]

Method used in Network class for finding best connection between points. This method need to be implemented in any class inheriting from Solver class.

Parameters

n	Pointer to Network in which Route is being searched for.

Returns

Pointer to found Route, NULL if no route can be found.

Implemented in SimAnnealingAlg, BsfAlg, BsfRandAlg, and DsfAlg.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/Solver.h
- /home/vka/Programming/C/workspace/RouteFinder/src/algorithm/Solver.cpp

3.18 StopData Class Reference

`#include <StopData.h>`

Public Member Functions

- StopData ()
- StopData (const StopData &src)
- StopData (std::string name, unsigned int id, double lat, double lng)
- ~StopData ()
- StopData & operator= (const StopData &src)
- bool operator== (const StopData src)
- std::string getName () const
- unsigned int getId () const
- double getLat () const
- double getLng () const

Friends

- std::ostream & operator<< (std::ostream &output, const StopData &src)

3.18.1 Detailed Description

Class containing data about routes when database is being created. Then convered into Route object.

3.18.2 Constructor & Destructor Documentation

3.18.2.1 StopData::StopData ( )

Default constructor.

3.18.2.2 StopData::StopData (const StopData & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.18.2.3 StopData::StopData (std::string *name,* unsigned int *id,* double *lat,* double *lng*)

Constructor.

Parameters

name	Name of route.
id	id of route.
lat,lng	coords of stop.

3.18.2.4 StopData::~StopData ( )

Destructor.

3.18.3 Member Function Documentation

3.18.3.1 unsigned int StopData::getId ( ) const

Returns

return id value.

3.18.3.2 double StopData::getLat ( ) const

Returns

return latitude value.

3.18.3.3 double StopData::getLng ( ) const

Returns

return longtitude value.

3.18.3.4 std::string StopData::getName ( ) const

Returns

Returns name value.

3.18.3.5 StopData & StopData::operator= (const StopData & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.18.3.6 bool StopData::operator== (const StopData *src*)

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if name and is are equal.

3.18.4 Friends And Related Function Documentation

3.18.4.1 std::ostream& operator<< (std::ostream & *output,* const StopData & *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/StopData.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/StopData.cpp

3.19 StopTimeData Class Reference

`#include <StopTimeData.h>`

Public Member Functions

- StopTimeData ()
- StopTimeData (const StopTimeData &src)
- StopTimeData (unsigned int id, unsigned int stopID, unsigned int serviceID, unsigned int tripID, std::string name)
- ~StopTimeData ()
- StopTimeData & operator= (const StopTimeData &src)
- bool operator== (const StopTimeData src)
- unsigned int getId () const
- unsigned int getServiceId () const

- unsigned int getStopId () const
- unsigned int getTripId () const
- Time getStopTime () const
- std::string getName () const

Friends

- std::ostream & operator<< (std::ostream &output, const StopTimeData &src)

3.19.1 Detailed Description

Class containing data about stopTimes when database is being created.

3.19.2 Constructor & Destructor Documentation

3.19.2.1 StopTimeData::StopTimeData ( )

Default constructor.

3.19.2.2 StopTimeData::StopTimeData (const StopTimeData & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.19.2.3 StopTimeData::StopTimeData (unsigned int *id*, unsigned int *stopID*, unsigned int *serviceID*, unsigned int *tripID*, std::string *name*)

Constructor.

Parameters

name	Name of route.
id	id of route.
stopID	ID of StopData object of which timetable info contains this object.
serviceID	id of ServiceData object.
tripID	TripData object being mentioned.

3.19.2.4 StopTimeData::~StopTimeData ( )

Destructor.

3.19.3 Member Function Documentation

3.19.3.1 unsigned int StopTimeData::getId ( ) const

Returns

Returns id value.

3.19.3.2 std::string StopTimeData::getName ( ) const

Returns

Returns name value.

3.19.3.3 unsigned int StopTimeData::getServiceId ( ) const

Returns

Returns ServiceData id value.

3.19.3.4 unsigned int StopTimeData::getStopId ( ) const

Returns

Returns StopData id value.

3.19.3.5 Time StopTimeData::getStopTime ( ) const

Returns

Returns Time value.

3.19.3.6 unsigned int StopTimeData::getTripId ( ) const

Returns

Returns TripData id value.

3.19.3.7 StopTimeData & StopTimeData::operator= (const StopTimeData & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.19.3.8 bool StopTimeData::operator== (const StopTimeData *src*)

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if name and is are equal.

3.19.4 Friends And Related Function Documentation

3.19.4.1 std::ostream& operator<< (std::ostream & *output,* const StopTimeData & *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/StopTimeData.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/StopTimeData.cpp

3.20 Tester Class Reference

Public Member Functions

- **Tester** (Network *n)
- void **makeTests** (Node *from, Node *to, std::string directory, long long seed=0)
- void **setDefaults** (double Tstart, double Tend, unsigned int k, double alpha, unsigned int allowedChange↩ Number, unsigned int changePunishment)

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

- /home/vka/Programming/C/workspace/RouteFinder/src/tester/Tester.h
- /home/vka/Programming/C/workspace/RouteFinder/src/tester/Tester.cpp

3.21 Time Class Reference

`#include <Time.h>`

Public Member Functions

- Time ()
- Time (unsigned int hour, unsigned int minute)
- Time (unsigned int minutes)
- Time (const Time &src)
- ~Time ()
- Time & operator= (const Time &src)
- bool operator== (const Time &src) const
- bool operator!= (const Time &src) const
- bool operator> (const Time src)
- bool **operator>=** (const Time src)
- bool operator< (const Time src)
- bool **operator<=** (const Time src)
- Time operator+ (const Time src)
- Time operator- (const Time src)
- operator int ()

Friends

- std::ostream & operator<< (std::ostream &output, const Time src)

3.21.1 Detailed Description

Class providing time functions used in timetable generation.

3.21.2 Constructor & Destructor Documentation

3.21.2.1 Time::Time ( )

Default constructor.

3.21.2.2 Time::Time (unsigned int *hour,* unsigned int *minute*)

Constructor.

Parameters

hour	Hour.
minute	Minute.

3.21.2.3 Time::Time (unsigned int *minutes*)

Constructor creating object pointing to time minutes ahead of midnight.

Parameters

minutes	Minutes from midnight.

3.21.2.4 Time::Time (const Time & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.21.2.5 Time::~Time ( )

Destructor.

3.21.3 Member Function Documentation

3.21.3.1 Time::operator int ( )

Converts Time to int.

3.21.3.2 bool Time::operator!= (const Time & *src*) const

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if given hours are not equal.

3.21.3.3 Time Time::operator+ (const Time *src*)

Addition operator. Creates object pointing to time created by adding two given hours.

Parameters

src	given Time object.

Returns

Time object.

3.21.3.4 Time Time::operator- (const Time *src*)

Subtraction operator. Creates object pointing to time created by subtracting two given hours.

Parameters

src	given Time object.

Returns

Time object.

3.21.3.5 bool Time::operator< (const Time *src*)

Greater than operator.

Returns

True if given "this" time is sooner from midnight than src time.

3.21.3.6 Time & Time::operator= (const Time & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.21.3.7 bool Time::operator== (const Time & *src*) const

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if given hours are equal.

3.21.3.8 bool Time::operator> (const Time *src*)

Greater than operator.

Returns

True if given "this" time is later from midnight than src time.

3.21.4 Friends And Related Function Documentation

3.21.4.1 std::ostream& operator<< (std::ostream & *output,* const Time *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/Time.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/Time.cpp

3.22 TripData Class Reference

`#include <TripData.h>`

Public Member Functions

- TripData ()
- TripData (const TripData &src)
- TripData (unsigned int id, unsigned int routeId, std::string name, std::vector< int > stopSec)
- ~TripData ()
- TripData & operator= (const TripData &src)
- bool operator== (const TripData src)
- unsigned int getId () const
- unsigned int getRouteId () const
- std::vector< int > getStopSec () const
- std::string getName () const

Friends

- std::ostream & operator<< (std::ostream &output, const TripData &src)

3.22.1 Detailed Description

Class containing data about Trip when database is being created. Then converted into Trip object.

3.22.2 Constructor & Destructor Documentation

3.22.2.1 TripData::TripData ( )

Default constructor.

3.22.2.2 TripData::TripData (const TripData & *src*)

Copying constructor.

Parameters

src	Object being copied.

3.22.2.3 TripData::TripData (unsigned int *id*, unsigned int *routeId*, std::string *name*, std::vector< int > *stopSec*)

Constructor.

Parameters

name	Name of route.
id	id of route.
routeId	RouteData id value.
stopSec	Vector containing stop sequence.

3.22.2.4 TripData::~TripData ( )

Destructor.

3.22.3 Member Function Documentation

3.22.3.1 unsigned int TripData::getId ( ) const

Returns

Returns id value.

3.22.3.2 std::string TripData::getName ( ) const

Returns

Returns name value.

3.22.3.3 unsigned int TripData::getRouteId ( ) const

Returns

Returns RouteData id value.

3.22.3.4 std::vector< int > TripData::getStopSec ( ) const

Returns

Returns stop sequence in vector<int>.

3.22.3.5 TripData & TripData::operator= (const TripData & *src*)

Assignment operator.

Parameters

src	Reference object being assigned.

Returns

Reference to self.

3.22.3.6 bool TripData::operator== (const TripData *src*)

Comparation operator.

Parameters

src	Reference to compared object.

Returns

True if name and is are equal.

3.22.4 Friends And Related Function Documentation

3.22.4.1 std::ostream& operator<< (std::ostream & *output,* const TripData & *src*) [friend]

Helper output function.

Parameters

output	Stream
src	Outputed object.

Returns

Reference to given stream.

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

- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/TripData.h
- /home/vka/Programming/C/workspace/RouteFinder/src/db/lib/TripData.cpp

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