My Project

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Chapter 1

Class Index

1.1 Class List

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

Chapter 2

Class Documentation

2.1 CRN Class Reference

Public Member Functions

- CRN (const std::string &filename, const std::string &model_name)

  constructor
- void print_rr () const

  prints all reaction rates to stdout
- void print_s () const

  prints all species to stdout
- void print_r () const

  prints all reactions to stdout
- void print_all () const

  prints raction rates, species, reactions and the stoichiometric matrix to stdout

Public Attributes

- const std::string filename

  name of the file containing all input information
- const std::string model_name

  name of the crn model
- size_t number_reaction_rates = 0

  number of reaction rates
- size_t number_species = 0

  number of species
- size_t number_reactions = 0

  number of reactions
- std::vector< GiNaC::symbol > reaction_rate_list

  list of all reaction rates
- std::vector< GiNaC::symbol > species_list

  list of all species
- std::vector< GiNaC::ex > reaction_list

  list of all reactions
- GiNaC::matrix stoichiometric

stoichiometric matrix of the crn

- std::string reaction_rates_signal = "reaction rates start"

  string in input file that signals that the parsing of reaction rates starts in the next line
- std::string species_signal = "species start"

  string in input file that signals that the parsing of species starts in the next line
- std::string reactions_signal = "reactions start"

  string in input file that signals that the parsing of reactions starts in the next line
- std::string end_signal = "end"

  string in input file that signals that the parsing ends with this line
- std::string no_constant_signal = "-"

  string in input file that signals that no reaction constant exists

2.1.1 Constructor & Destructor Documentation

2.1.1.1 CRN()

```
CRN::CRN (
            const std::string & filename,
            const std::string & model_name )
```

constructor

takes a filename of a text file containing all necessary information about the CRN and converts the input to processable state. for information on how the input file should look like, see the input_example.txt file and the README.txt file.

2.1.2 Member Data Documentation

2.1.2.1 model_name

```
const std::string CRN::model_name
```

name of the crn model

this name will be used for marking the output data

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

- crn.hpp
- crn.cpp

2.2 Math Class Reference

Static Public Member Functions

- static GiNaC::matrix jacobian (const std::vector< GiNaC::ex > &functions, const std::vector< GiNaC↩ ::symbol > &variables)

  calculates the jacobian matrix of given sets of functions and variables
- static std::vector< std::vector< int > > binary_matrix (size_t number_rows)

  returns a matrix of 0s and 1s
- static int calculate_determinant (const std::vector< std::vector< double >> &m, size_t size)

  calculates the determinant of a matrix

2.2.1 Member Function Documentation

2.2.1.1 binary_matrix()

```
static std::vector<std::vector<int> > Math::binary_matrix (
             size_t number_rows )  [inline], [static]
```

returns a matrix of 0s and 1s

takes a number and returns a matrix with size 2^number-1 where each column represents a unique binary number within the range of 1 to 2^number

2.2.1.2 calculate_determinant()

```
static int Math::calculate_determinant (
             const std::vector< std::vector< double >> & m,
             size_t size )  [inline], [static]
```

calculates the determinant of a matrix

returns the determinant of a given square matrix of given size. The chosen algorithm is rather efficient, but for now only works for matrices with size 1-10.

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

- math.hpp

2.3 MonotoneDependenciesCalculator Class Reference

Public Member Functions

- MonotoneDependenciesCalculator (const CRN &crn, const size_t mode)

  constructor
- void run ()

  calculates monoticity dependencies on the crn
- void log (const std::string dirname) const

  logs all output

Public Attributes

- size_t number_leading_zeros = 5

2.3.1 Member Function Documentation

2.3.1.1 log()

```
void MonotoneDependenciesCalculator::log (
             const std::string dirname ) const
```

logs all output

logs all output into the given dir; the output files will be characterized by the given model name

2.3.2 Member Data Documentation

2.3.2.1 number_leading_zeros

```
size_t MonotoneDependenciesCalculator::number_leading_zeros = 5
```

the output comprises of graph and data files with the naming convention as follows: graph files: <modelname>↩_graph_<number_leading_zeros zeros><incrementing number of output, starting from zero>.dot data files↩: <modelname>_output_<number_leading_zeros zeros><incrementing number of output, starting from zero>.txt

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

- monotonedependenciescalculator.hpp
- monotonedependenciescalculator.cpp