NAME

CyclesDetection

SYNOPSIS

use Graph::CyclesDetection;

use Graph::CyclesDetection qw(:all);

DESCRIPTION

CyclesDetection class provides the following methods:

new, Copy, DetectCycles, DetectCyclesUsingCollapsingPathGraphMethodology, GetAllCyclicPaths, GetIndependentCyclicPaths, StringifyCyclesDetection

Cycles in a Graph are detected using collapsing path graph [Ref 31] methodology.

METHODS

new

```
$NewCyclesDetection = new Graph::CyclesDetection($Graph);
```

Using specified *Graph*, new method creates a new CyclesDetection object and returns newly created CyclesDetection object.

Copy

```
$NewCyclesDetection = $CyclesDetection->Copy();
```

Copies *CyclesDetection* and its associated data using Storable::dclone and returns a new CyclesDetection object.

DetectCycles

```
$CyclesDetection->DetectCycles();
```

Detects all cycles in a graph and returns *CyclesDetection*.

DetectCyclesUsingCollapsingPathGraphMethodology

```
$CyclesDetection->DetectCyclesUsingCollapsingPathGraphMethodology();
```

Detects all cycles in a graph using collapsing path graph [Ref 31] methodology and returns *CyclesDetection*.

GetAllCyclicPaths

```
@AllCyclicPaths = $CyclesDetection->GetAllCyclicPaths();
$NumOfAllCyclicPaths = $CyclesDetection->GetAllCyclicPaths();
```

Returns an array containing references to all cyclic paths identified during cycles detection. In scalar text, number of cycles is returned.

GetIndependentCyclicPaths

```
@IndependentCyclicPaths = $CyclesDetection->GetAllCyclicPaths();
$NumOfIndependentCyclicPaths = $CyclesDetection->GetAllCyclicPaths();
```

Returns an array containing references to independent cyclic paths identified during cycles detection. In scalar text, number of cycles is returned.

A set of independent cycles identified during cycles detection doesn't correspond to the basis set of rings or smallest set of smallest rings (SSSR) [Refs 29-30]; instead, set of cycles indentified as independent cycles simply correpond to cycles which contain no other cycle as their subcycles and can't be described as a linear combination of smaller cycles. And it also happens to contain all the rings in basis set of rings and SSSR. In other words, it's a superset of a basis set of cycles and SSSR. For example, six four membered cycles are indentified for cubane, which is one more than the basis set of cycles.

StringifyCyclesDetection

```
$String = $CyclesDetection->StringifyCyclesDetection();
```

Returns a string containing information about *CyclesDetection* object.

AUTHOR

Manish Sud <msud@san.rr.com>

SEE ALSO

Graph.pm, Path.pm, PathGraph.pm

COPYRIGHT