

## NAME

CyclesDetection

## SYNOPSIS

```
use CyclesDetection;

use 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`

```
$NewCyclesDetection = new CyclesDetection($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 identified as independent cycles simply correspond 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 happen to contain all the rings in basis set of rings and SSSR. In otherwords, it's a superset of a basis set of cycles and SSSR. For example, six four membered cycles are identified 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

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