

# ExpositoTOP

## v2

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<b>1 Namespace Index</b>	<b>1</b>
1.1 Package List . . . . .	1
<b>2 Hierarchical Index</b>	<b>3</b>
2.1 Class Hierarchy . . . . .	3
<b>3 Class Index</b>	<b>5</b>
3.1 Class List . . . . .	5
<b>4 File Index</b>	<b>7</b>
4.1 File List . . . . .	7
<b>5 Namespace Documentation</b>	<b>9</b>
5.1 Package es.ull.esit . . . . .	9
5.2 Package es.ull.esit.utilities . . . . .	9
5.3 Package es.ull.esit.utils . . . . .	9
5.4 Package top . . . . .	9
<b>6 Class Documentation</b>	<b>11</b>
6.1 es.ull.esit.AppTest Class Reference . . . . .	11
6.1.1 Detailed Description . . . . .	11
6.1.2 Member Function Documentation . . . . .	11
6.1.2.1 shouldAnswerWithTrue() . . . . .	11
6.2 es.ull.esit.utilities.BellmanFord Class Reference . . . . .	11
6.2.1 Constructor & Destructor Documentation . . . . .	12
6.2.1.1 BellmanFord() . . . . .	12
6.2.2 Member Function Documentation . . . . .	12
6.2.2.1 getDistances() . . . . .	12
6.2.2.2 getValue() . . . . .	12
6.2.2.3 solve() . . . . .	12
6.3 es.ull.esit.utilities.ExpositoUtilities Class Reference . . . . .	13
6.3.1 Member Function Documentation . . . . .	13
6.3.1.1 getFormat() [1/12] . . . . .	13
6.3.1.2 getFormat() [2/12] . . . . .	13
6.3.1.3 getFormat() [3/12] . . . . .	14
6.3.1.4 getFormat() [4/12] . . . . .	14
6.3.1.5 getFormat() [5/12] . . . . .	14
6.3.1.6 getFormat() [6/12] . . . . .	14
6.3.1.7 getFormat() [7/12] . . . . .	14
6.3.1.8 getFormat() [8/12] . . . . .	14
6.3.1.9 getFormat() [9/12] . . . . .	15
6.3.1.10 getFormat() [10/12] . . . . .	15
6.3.1.11 getFormat() [11/12] . . . . .	15
6.3.1.12 getFormat() [12/12] . . . . .	15

6.3.1.13 isAcyclic()	15
6.3.1.14 isDouble()	15
6.3.1.15 isInteger()	16
6.3.1.16 multiplyMatrices()	16
6.3.1.17 printFile()	16
6.3.1.18 simplifyString()	16
6.3.1.19 therelsPath()	16
6.3.1.20 writeTextToFile()	16
6.3.2 Member Data Documentation	16
6.3.2.1 ALIGNMENT_LEFT	17
6.3.2.2 ALIGNMENT_RIGHT	17
6.3.2.3 DEFAULT_COLUMN_WIDTH	17
6.4 top.mainTOPTW Class Reference	17
6.4.1 Member Function Documentation	17
6.4.1.1 main()	17
6.5 es.ull.esit.utils.Pair< F, S > Class Template Reference	17
6.5.1 Constructor & Destructor Documentation	18
6.5.1.1 Pair()	18
6.5.2 Member Function Documentation	18
6.5.2.1 create()	18
6.5.2.2 equals()	18
6.5.2.3 hashCode()	18
6.5.3 Member Data Documentation	18
6.5.3.1 first	19
6.5.3.2 second	19
6.6 es.ull.esit.utilities.PowerSet< E > Class Template Reference	19
6.6.1 Detailed Description	19
6.6.2 Constructor & Destructor Documentation	19
6.6.2.1 PowerSet()	20
6.6.3 Member Function Documentation	20
6.6.3.1 hasNext()	20
6.6.3.2 iterator()	20
6.6.3.3 next()	20
6.6.3.4 remove()	20
6.7 top.TOPTW Class Reference	21
6.7.1 Constructor & Destructor Documentation	21
6.7.1.1 TOPTW()	21
6.7.2 Member Function Documentation	21
6.7.2.1 addNode()	22
6.7.2.2 addNodeDepot()	22
6.7.2.3 calculateDistanceMatrix()	22
6.7.2.4 getDistance() [1/4]	22

6.7.2.5	getDistance()	[ 2/4 ]	22
6.7.2.6	getDistance()	[ 3/4 ]	22
6.7.2.7	getDistance()	[ 4/4 ]	22
6.7.2.8	getDueTime()		23
6.7.2.9	getMaxRoutes()		23
6.7.2.10	getMaxTimePerRoute()		23
6.7.2.11	getNodes()		23
6.7.2.12	getPOIs()		23
6.7.2.13	getReadyTime()		23
6.7.2.14	getScore()	[ 1/2 ]	23
6.7.2.15	getScore()	[ 2/2 ]	24
6.7.2.16	getServiceTime()		24
6.7.2.17	getTime()		24
6.7.2.18	getVehicles()		24
6.7.2.19	getX()		24
6.7.2.20	getY()		24
6.7.2.21	isDepot()		24
6.7.2.22	setDueTime()		25
6.7.2.23	setMaxRoutes()		25
6.7.2.24	setMaxTimePerRoute()		25
6.7.2.25	setNodes()		25
6.7.2.26	setReadyTime()		25
6.7.2.27	setScore()		25
6.7.2.28	setServiceTime()		26
6.7.2.29	setX()		26
6.7.2.30	setY()		26
6.7.2.31	toString()		26
6.8	top.TOPTWEvaluator Class Reference		26
6.8.1	Member Function Documentation		26
6.8.1.1	evaluate()		27
6.8.2	Member Data Documentation		27
6.8.2.1	NO_EVALUATED		27
6.9	top.TOPTWGRASP Class Reference		27
6.9.1	Constructor & Destructor Documentation		27
6.9.1.1	TOPTWGRASP()		28
6.9.2	Member Function Documentation		28
6.9.2.1	aleatorySelectionRCL()		28
6.9.2.2	comprehensiveEvaluation()		28
6.9.2.3	computeGreedySolution()		28
6.9.2.4	fuzzySelectionAlphaCutRCL()		28
6.9.2.5	fuzzySelectionBestFDRCL()		28
6.9.2.6	getMaxScore()		29

6.9.2.7	getSolution()	29
6.9.2.8	getSolutionTime()	29
6.9.2.9	GRASP()	29
6.9.2.10	setSolution()	29
6.9.2.11	setSolutionTime()	29
6.9.2.12	updateSolution()	29
6.9.3	Member Data Documentation	30
6.9.3.1	NO_EVALUATED	30
6.10	top.TOPTWReader Class Reference	30
6.10.1	Member Function Documentation	30
6.10.1.1	readProblem()	30
6.11	top.TOPTWRoute Class Reference	30
6.11.1	Member Function Documentation	31
6.11.1.1	getId()	31
6.11.1.2	getPredecessor()	31
6.11.1.3	getSuccessor()	31
6.11.1.4	setId()	31
6.11.1.5	setPredecessor()	31
6.11.1.6	setSuccessor()	31
6.12	top.TOPTWSolution Class Reference	32
6.12.1	Constructor & Destructor Documentation	32
6.12.1.1	TOPTWSolution()	32
6.12.2	Member Function Documentation	32
6.12.2.1	addRoute()	33
6.12.2.2	evaluateFitness()	33
6.12.2.3	getAvailableVehicles()	33
6.12.2.4	getCreatedRoutes()	33
6.12.2.5	getDistance()	33
6.12.2.6	getIndexRoute()	33
6.12.2.7	getInfoSolution()	33
6.12.2.8	getObjectiveFunctionValue()	34
6.12.2.9	getPositionInRoute()	34
6.12.2.10	getPredecessor()	34
6.12.2.11	getPredecessors()	34
6.12.2.12	getProblem()	34
6.12.2.13	getSuccessor()	34
6.12.2.14	getSuccessors()	34
6.12.2.15	getWaitingTime()	35
6.12.2.16	initSolution()	35
6.12.2.17	isDepot()	35
6.12.2.18	isEqual()	35
6.12.2.19	printSolution()	35

6.12.2.20 setAvailableVehicles()	35
6.12.2.21 setObjectiveFunctionValue()	35
6.12.2.22 setPositionInRoute()	36
6.12.2.23 setPredecessor()	36
6.12.2.24 setSuccessor()	36
6.12.2.25 setWaitingTime()	36
6.12.3 Member Data Documentation	36
6.12.3.1 NO_INITIALIZED	36
<b>7 File Documentation</b>	<b>37</b>
7.1 src/main/java/es/ull/esit/utilities/BellmanFord.java File Reference	37
7.2 src/main/java/es/ull/esit/utilities/ExpositoUtilities.java File Reference	37
7.3 src/main/java/es/ull/esit/utilities/PowerSet.java File Reference	37
7.4 src/main/java/es/ull/esit/utills/Pair.java File Reference	38
7.5 src/main/java/top/mainTOPTW.java File Reference	38
7.6 src/main/java/top/TOPTW.java File Reference	38
7.7 src/main/java/top/TOPTWEvaluator.java File Reference	38
7.8 src/main/java/top/TOPTWGRASP.java File Reference	39
7.9 src/main/java/top/TOPTWReader.java File Reference	39
7.10 src/main/java/top/TOPTWRoute.java File Reference	39
7.11 src/main/java/top/TOPTWSolution.java File Reference	39
7.12 src/test/java/es/ull/esit/AppTest.java File Reference	39
<b>Index</b>	<b>41</b>





# Chapter 1

## Namespace Index

### 1.1 Package List

Here are the packages with brief descriptions (if available):

<b>es.ull.esit</b>	9
<b>es.ull.esit.utilities</b>	9
<b>es.ull.esit.utils</b>	9
<b>top</b>	9



## Chapter 2

# Hierarchical Index

### 2.1 Class Hierarchy

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

es.ull.esit.AppTest . . . . .	11
es.ull.esit.utilities.BellmanFord . . . . .	11
es.ull.esit.utilities.ExpositoUtilities . . . . .	13
Iterable	
es.ull.esit.utilities.PowerSet< E > . . . . .	19
top.mainTOPTW . . . . .	17
es.ull.esit.utils.Pair< F, S > . . . . .	17
top.TOPTW . . . . .	21
top.TOPTWEvaluator . . . . .	26
top.TOPTWGRASP . . . . .	27
top.TOPTWReader . . . . .	30
top.TOPTWRoute . . . . .	30
top.TOPTWSolution . . . . .	32
Iterator	
es.ull.esit.utilities.PowerSet< E > . . . . .	19



## Chapter 3

# Class Index

### 3.1 Class List

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

<b>es.ull.esit.AppTest</b>	11
<b>es.ull.esit.utilities.BellmanFord</b>	11
<b>es.ull.esit.utilities.ExpositoUtilities</b>	13
<b>top.mainTOPTW</b>	17
<b>es.ull.esit.utils.Pair&lt; F, S &gt;</b>	17
<b>es.ull.esit.utilities.PowerSet&lt; E &gt;</b>	
Sirve para calcular todos los subconjuntos de un conjunto dado	19
<b>top.TOPTW</b>	21
<b>top.TOPTWEvaluator</b>	26
<b>top.TOPTWGRASP</b>	27
<b>top.TOPTWReader</b>	30
<b>top.TOPTWRoute</b>	30
<b>top.TOPTWSolution</b>	32



## Chapter 4

# File Index

### 4.1 File List

Here is a list of all files with brief descriptions:

src/main/java/es/ull/esit/utilities/ <b>BellmanFord.java</b> . . . . .	37
src/main/java/es/ull/esit/utilities/ <b>ExpositoUtilities.java</b> . . . . .	37
src/main/java/es/ull/esit/utilities/ <b>PowerSet.java</b> . . . . .	37
src/main/java/es/ull/esit/utills/ <b>Pair.java</b> . . . . .	38
src/main/java/top/ <b>mainTOPTW.java</b> . . . . .	38
src/main/java/top/ <b>TOPTW.java</b> . . . . .	38
src/main/java/top/ <b>TOPTWEvaluator.java</b> . . . . .	38
src/main/java/top/ <b>TOPTWGRASP.java</b> . . . . .	39
src/main/java/top/ <b>TOPTWReader.java</b> . . . . .	39
src/main/java/top/ <b>TOPTWRoute.java</b> . . . . .	39
src/main/java/top/ <b>TOPTWSolution.java</b> . . . . .	39
src/test/java/es/ull/esit/ <b>AppTest.java</b> . . . . .	39





## Chapter 5

# Namespace Documentation

### 5.1 Package es.ull.esit

#### Packages

- package **utilities**
- package **utils**

#### Classes

- class **AppTest**

### 5.2 Package es.ull.esit.utilities

#### Classes

- class **BellmanFord**
- class **ExpositoUtilities**
- class **PowerSet**

*Sirve para calcular todos los subconjuntos de un conjunto dado.*

### 5.3 Package es.ull.esit.utils

#### Classes

- class **Pair**

### 5.4 Package top

#### Classes

- class **mainTOPTW**
- class **TOPTW**
- class **TOPTWEvaluator**
- class **TOPTWGRASP**
- class **TOPTWReader**
- class **TOPTWRoute**
- class **TOPTWSolution**



## Chapter 6

# Class Documentation

### 6.1 es.ull.esit.AppTest Class Reference

#### Public Member Functions

- void **shouldAnswerWithTrue** ()

#### 6.1.1 Detailed Description

Unit test for simple App.

#### 6.1.2 Member Function Documentation

##### 6.1.2.1 shouldAnswerWithTrue()

```
void es.ull.esit.AppTest.shouldAnswerWithTrue ( )
```

Rigorous Test :-)

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

- src/test/java/es/ull/esit/ **AppTest.java**

### 6.2 es.ull.esit.utilities.BellmanFord Class Reference

#### Public Member Functions

- **BellmanFord** (int[ ][ ] distanceMatrix, int nodes, ArrayList< Integer > path)
- int[] **getDistances** ()
- int **getValue** ()
- void **solve** ()

## 6.2.1 Constructor & Destructor Documentation

### 6.2.1.1 BellmanFord()

```
es.ull.esit.utilities.BellmanFord.BellmanFord (
    int distanceMatrix[],
    int nodes,
    ArrayList< Integer > path )
```

#### Parameters

<i>distanceMatrix</i>	
<i>nodes</i>	
<i>path</i>	

## 6.2.2 Member Function Documentation

### 6.2.2.1 getDistances()

```
int[] es.ull.esit.utilities.BellmanFord.getDistances ( )
```

#### Returns

### 6.2.2.2 getValue()

```
int es.ull.esit.utilities.BellmanFord.getValue ( )
```

#### Returns

### 6.2.2.3 solve()

```
void es.ull.esit.utilities.BellmanFord.solve ( )
```

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

- src/main/java/es/ull/esit/utilities/ **BellmanFord.java**

## 6.3 es.ull.esit.utilities.ExpositoUtilities Class Reference

### Static Public Member Functions

- static void **printFile** (String file)
- static String **simplifyString** (String string)
- static double[][] **multiplyMatrices** (double a[], double b[])
- static void **writeTextToFile** (String file, String text) throws IOException
- static String **getFormat** (String string)
- static String **getFormat** (double value)
- static String **getFormat** (double value, int zeros)
- static String **getFormat** (String string, int width)
- static String **getFormat** (String string, int width, int alignment)
- static String **getFormat** (ArrayList< String > strings, int width)
- static String **getFormat** (ArrayList< Integer > strings)
- static String **getFormat** (String[] strings, int width)
- static String **getFormat** (String[][] matrixStrings, int width)
- static String **getFormat** (String[] strings)
- static String **getFormat** (String[] strings, int[] width)
- static String **getFormat** (String[] strings, int[] width, int[] alignment)
- static boolean **isInteger** (String str)
- static boolean **isDouble** (String str)
- static boolean **isAcyclic** (int[][] distanceMatrix)
- static boolean **therelsPath** (int[][] distanceMatrix, int node)

### Static Public Attributes

- static final int **DEFAULT\_COLUMN\_WIDTH** = 10
- static final int **ALIGNMENT\_LEFT** = 1
- static final int **ALIGNMENT\_RIGHT** = 2

### 6.3.1 Member Function Documentation

#### 6.3.1.1 getFormat() [1/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    ArrayList< Integer > strings ) [static]
```

#### 6.3.1.2 getFormat() [2/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    ArrayList< String > strings,
    int width ) [static]
```

#### 6.3.1.3 getFormat() [3/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    double value ) [static]
```

#### 6.3.1.4 getFormat() [4/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    double value,
    int zeros ) [static]
```

#### 6.3.1.5 getFormat() [5/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String string ) [static]
```

#### 6.3.1.6 getFormat() [6/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String string,
    int width ) [static]
```

#### 6.3.1.7 getFormat() [7/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String string,
    int width,
    int alignment ) [static]
```

#### 6.3.1.8 getFormat() [8/12]

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String[] strings ) [static]
```

**6.3.1.9 getFormat() [9/12]**

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String[] strings,
    int width ) [static]
```

**6.3.1.10 getFormat() [10/12]**

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String[] strings,
    int[] width ) [static]
```

**6.3.1.11 getFormat() [11/12]**

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String[] strings,
    int[] width,
    int[] alignment ) [static]
```

**6.3.1.12 getFormat() [12/12]**

```
static String es.ull.esit.utilities.ExpositoUtilities.getFormat (
    String matrixStrings[][],
    int width ) [static]
```

**6.3.1.13 isAcyclic()**

```
static boolean es.ull.esit.utilities.ExpositoUtilities.isAcyclic (
    int distanceMatrix[][] ) [static]
```

**6.3.1.14 isDouble()**

```
static boolean es.ull.esit.utilities.ExpositoUtilities.isDouble (
    String str ) [static]
```

#### 6.3.1.15 isInteger()

```
static boolean es.ull.esit.utilities.ExpositoUtilities.isInteger (
    String str ) [static]
```

#### 6.3.1.16 multiplyMatrices()

```
static double[][] es.ull.esit.utilities.ExpositoUtilities.multiplyMatrices (
    double a[][],
    double b[][] ) [static]
```

#### 6.3.1.17 printFile()

```
static void es.ull.esit.utilities.ExpositoUtilities.printFile (
    String file ) [static]
```

#### 6.3.1.18 simplifyString()

```
static String es.ull.esit.utilities.ExpositoUtilities.simplifyString (
    String string ) [static]
```

#### 6.3.1.19 thereIsPath()

```
static boolean es.ull.esit.utilities.ExpositoUtilities.thereIsPath (
    int distanceMatrix[][],
    int node ) [static]
```

#### 6.3.1.20 writeTextToFile()

```
static void es.ull.esit.utilities.ExpositoUtilities.writeTextToFile (
    String file,
    String text ) throws IOException [static]
```

### 6.3.2 Member Data Documentation



### 6.3.2.1 ALIGNMENT\_LEFT

```
final int es.ull.esit.utilities.ExpositoUtilities.ALIGNMENT_LEFT = 1 [static]
```

### 6.3.2.2 ALIGNMENT\_RIGHT

```
final int es.ull.esit.utilities.ExpositoUtilities.ALIGNMENT_RIGHT = 2 [static]
```

### 6.3.2.3 DEFAULT\_COLUMN\_WIDTH

```
final int es.ull.esit.utilities.ExpositoUtilities.DEFAULT_COLUMN_WIDTH = 10 [static]
```

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

- src/main/java/es/ull/esit/utilities/ **ExpositoUtilities.java**

## 6.4 top.mainTOPTW Class Reference

### Static Public Member Functions

- static void **main** (String[] args)

### 6.4.1 Member Function Documentation

#### 6.4.1.1 main()

```
static void top.mainTOPTW.main (  
    String[] args ) [static]
```

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

- src/main/java/top/ **mainTOPTW.java**

## 6.5 es.ull.esit.utils.Pair< F, S > Class Template Reference

### Public Member Functions

- **Pair** (F **first**, S **second**)
- boolean **equals** (Object o)
- int **hashCode** ()

## Static Public Member Functions

- `static< A, B > Pair< A, B > create (A a, B b)`

## Public Attributes

- `final F first`
- `final S second`

## 6.5.1 Constructor & Destructor Documentation

### 6.5.1.1 Pair()

```
es.ull.esit.utils.Pair< F, S >. Pair (
    F first,
    S second )
```

## 6.5.2 Member Function Documentation

### 6.5.2.1 create()

```
static< A, B > Pair< A, B > es.ull.esit.utils.Pair< F, S >.create (
    A a,
    B b ) [static]
```

### 6.5.2.2 equals()

```
boolean es.ull.esit.utils.Pair< F, S >.equals (
    Object o )
```

### 6.5.2.3 hashCode()

```
int es.ull.esit.utils.Pair< F, S >.hashCode ( )
```

## 6.5.3 Member Data Documentation

### 6.5.3.1 first

```
final F es.ull.esit.utils.Pair< F, S >.first
```

### 6.5.3.2 second

```
final S es.ull.esit.utils.Pair< F, S >.second
```

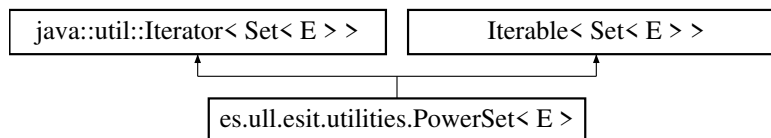
The documentation for this class was generated from the following file:

- src/main/java/es/ull/esit/utils/ **Pair.java**

## 6.6 es.ull.esit.utilities.PowerSet< E > Class Template Reference

Sirve para calcular todos los subconjuntos de un conjunto dado.

Inheritance diagram for es.ull.esit.utilities.PowerSet< E >:



### Public Member Functions

- **PowerSet** (Set< E > set)
- boolean **hasNext** ()
- Set< E > **next** ()
- void **remove** ()
- Iterator< Set< E > > **iterator** ()

### 6.6.1 Detailed Description

Sirve para calcular todos los subconjuntos de un conjunto dado.

Parameters

<i>string</i>	Hola A more detailed class description
---------------	--

### 6.6.2 Constructor & Destructor Documentation

### 6.6.2.1 PowerSet()

```
es.ull.esit.utilities.PowerSet< E >. PowerSet (
    Set< E > set )
```

## 6.6.3 Member Function Documentation

### 6.6.3.1 hasNext()

```
boolean es.ull.esit.utilities.PowerSet< E >.hasNext ( )
```

### 6.6.3.2 iterator()

```
Iterator< Set< E > > es.ull.esit.utilities.PowerSet< E >.iterator ( )
```

### 6.6.3.3 next()

```
Set< E > es.ull.esit.utilities.PowerSet< E >.next ( )
```

### 6.6.3.4 remove()

```
void es.ull.esit.utilities.PowerSet< E >.remove ( )
```

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

- src/main/java/es/ull/esit/utilities/ **PowerSet.java**

## 6.7 top.TOPTW Class Reference

### Public Member Functions

- **TOPTW** (int nodes, int routes)
- boolean **isDepot** (int a)
- double **getDistance** (int[] route)
- double **getDistance** (ArrayList< Integer > route)
- double **getDistance** (ArrayList< Integer >[] routes)
- void **calculateDistanceMatrix** ()
- double **getMaxTimePerRoute** ()
- void **setMaxTimePerRoute** (double maxTimePerRoute)
- double **getMaxRoutes** ()
- void **setMaxRoutes** (double maxRoutes)
- int **getPOIs** ()
- double **getDistance** (int i, int j)
- double **getTime** (int i, int j)
- int **getNodes** ()
- void **setNodes** (int nodes)
- double **getX** (int index)
- void **setX** (int index, double x)
- double **getY** (int index)
- void **setY** (int index, double y)
- double **getScore** (int index)
- double[] **getScore** ()
- void **setScore** (int index, double score)
- double **getReadyTime** (int index)
- void **setReadyTime** (int index, double readyTime)
- double **getDueTime** (int index)
- void **setDueTime** (int index, double dueTime)
- double **getServiceTime** (int index)
- void **setServiceTime** (int index, double serviceTime)
- int **getVehicles** ()
- String **toString** ()
- int **addNode** ()
- int **addNodeDepot** ()

### 6.7.1 Constructor & Destructor Documentation

#### 6.7.1.1 TOPTW()

```
top.TOPTW.TOPTW (
    int nodes,
    int routes )
```

### 6.7.2 Member Function Documentation

**6.7.2.1 addNode()**

```
int top.TOPTW.addNode ( )
```

**6.7.2.2 addNodeDepot()**

```
int top.TOPTW.addNodeDepot ( )
```

**6.7.2.3 calculateDistanceMatrix()**

```
void top.TOPTW.calculateDistanceMatrix ( )
```

**6.7.2.4 getDistance() [1/4]**

```
double top.TOPTW.getDistance (
    ArrayList< Integer > route )
```

**6.7.2.5 getDistance() [2/4]**

```
double top.TOPTW.getDistance (
    ArrayList< Integer >[] routes )
```

**6.7.2.6 getDistance() [3/4]**

```
double top.TOPTW.getDistance (
    int i,
    int j )
```

**6.7.2.7 getDistance() [4/4]**

```
double top.TOPTW.getDistance (
    int[] route )
```

#### 6.7.2.8 getDueTime()

```
double top.TOPTW.getDueTime (
    int index )
```

#### 6.7.2.9 getMaxRoutes()

```
double top.TOPTW.getMaxRoutes ( )
```

#### 6.7.2.10 getMaxTimePerRoute()

```
double top.TOPTW.getMaxTimePerRoute ( )
```

#### 6.7.2.11 getNodes()

```
int top.TOPTW.getNodes ( )
```

#### 6.7.2.12 getPOIs()

```
int top.TOPTW.getPOIs ( )
```

#### 6.7.2.13 getReadyTime()

```
double top.TOPTW.getReadyTime (
    int index )
```

#### 6.7.2.14 getScore() [1/2]

```
double[] top.TOPTW.getScore ( )
```

**6.7.2.15 getScore() [2/2]**

```
double top.TOPTW.getScore (
    int index )
```

**6.7.2.16 getServiceTime()**

```
double top.TOPTW.getServiceTime (
    int index )
```

**6.7.2.17 getTime()**

```
double top.TOPTW.getTime (
    int i,
    int j )
```

**6.7.2.18 getVehicles()**

```
int top.TOPTW.getVehicles ( )
```

**6.7.2.19 getX()**

```
double top.TOPTW.getX (
    int index )
```

**6.7.2.20 getY()**

```
double top.TOPTW.getY (
    int index )
```

**6.7.2.21 isDepot()**

```
boolean top.TOPTW.isDepot (
    int a )
```



#### 6.7.2.22 setDueTime()

```
void top.TOPTW.setDueTime (
    int index,
    double dueTime )
```

#### 6.7.2.23 setMaxRoutes()

```
void top.TOPTW.setMaxRoutes (
    double maxRoutes )
```

#### 6.7.2.24 setMaxTimePerRoute()

```
void top.TOPTW.setMaxTimePerRoute (
    double maxTimePerRoute )
```

#### 6.7.2.25 setNodes()

```
void top.TOPTW.setNodes (
    int nodes )
```

#### 6.7.2.26 setReadyTime()

```
void top.TOPTW.setReadyTime (
    int index,
    double readyTime )
```

#### 6.7.2.27 setScore()

```
void top.TOPTW.setScore (
    int index,
    double score )
```

#### 6.7.2.28 `setServiceTime()`

```
void top.TOPTW.setServiceTime (
    int index,
    double serviceTime )
```

#### 6.7.2.29 `setX()`

```
void top.TOPTW.setX (
    int index,
    double x )
```

#### 6.7.2.30 `setY()`

```
void top.TOPTW.setY (
    int index,
    double y )
```

#### 6.7.2.31 `toString()`

```
String top.TOPTW.toString ( )
```

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

- `src/main/java/top/ TOPTW.java`

## 6.8 `top.TOPTWEvaluator` Class Reference

### Public Member Functions

- void `evaluate` ( `TOPTWSolution` solution)

### Static Public Attributes

- static double `NO_EVALUATED` = -1.0

### 6.8.1 Member Function Documentation

### 6.8.1.1 evaluate()

```
void top.TOPTWEvaluator.evaluate (
    TOPTWSolution solution )
```

## 6.8.2 Member Data Documentation

### 6.8.2.1 NO\_EVALUATED

```
double top.TOPTWEvaluator.NO_EVALUATED = -1.0 [static]
```

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

- src/main/java/top/ **TOPTWEvaluator.java**

## 6.9 top.TOPTWGRASP Class Reference

### Public Member Functions

- **TOPTWGRASP** ( **TOPTWSolution** sol)
- void **GRASP** (int maxIterations, int maxSizeRCL)
- int **aleatorySelectionRCL** (int maxTRCL)
- int **fuzzySelectionBestFDRCL** (ArrayList< double[] > rcl)
- int **fuzzySelectionAlphaCutRCL** (ArrayList< double[] > rcl, double alpha)
- void **computeGreedySolution** (int maxSizeRCL)
- void **updateSolution** (double[] candidateSelected, ArrayList< ArrayList< Double > > departureTimes)
- ArrayList< double[] > **comprehensiveEvaluation** (ArrayList< Integer > customers, ArrayList< ArrayList< Double > > departureTimes)
- **TOPTWSolution** **getSolution** ()
- void **setSolution** ( **TOPTWSolution** solution)
- int **getSolutionTime** ()
- void **setSolutionTime** (int solutionTime)
- double **getMaxScore** ()

### Static Public Attributes

- static double **NO\_EVALUATED** = -1.0

### 6.9.1 Constructor & Destructor Documentation

### 6.9.1.1 TOPTWGRASP()

```
top.TOPTWGRASP.TOPTWGRASP (
    TOPTWSolution sol )
```

## 6.9.2 Member Function Documentation

### 6.9.2.1 aleatorySelectionRCL()

```
int top.TOPTWGRASP.aleatorySelectionRCL (
    int maxTRCL )
```

### 6.9.2.2 comprehensiveEvaluation()

```
ArrayList< double[] > top.TOPTWGRASP.comprehensiveEvaluation (
    ArrayList< Integer > customers,
    ArrayList< ArrayList< Double > > departureTimes )
```

### 6.9.2.3 computeGreedySolution()

```
void top.TOPTWGRASP.computeGreedySolution (
    int maxSizeRCL )
```

### 6.9.2.4 fuzzySelectionAlphaCutRCL()

```
int top.TOPTWGRASP.fuzzySelectionAlphaCutRCL (
    ArrayList< double[] > rcl,
    double alpha )
```

### 6.9.2.5 fuzzySelectionBestFDRCL()

```
int top.TOPTWGRASP.fuzzySelectionBestFDRCL (
    ArrayList< double[] > rcl )
```

#### 6.9.2.6 getMaxScore()

```
double top.TOPTWGRASP.getMaxScore ( )
```

#### 6.9.2.7 getSolution()

```
TOPTWSolution top.TOPTWGRASP.getSolution ( )
```

#### 6.9.2.8 getSolutionTime()

```
int top.TOPTWGRASP.getSolutionTime ( )
```

#### 6.9.2.9 GRASP()

```
void top.TOPTWGRASP.GRASP (
    int maxIterations,
    int maxSizeRCL )
```

#### 6.9.2.10 setSolution()

```
void top.TOPTWGRASP.setSolution (
    TOPTWSolution solution )
```

#### 6.9.2.11 setSolutionTime()

```
void top.TOPTWGRASP.setSolutionTime (
    int solutionTime )
```

#### 6.9.2.12 updateSolution()

```
void top.TOPTWGRASP.updateSolution (
    double[] candidateSelected,
    ArrayList< ArrayList< Double > > departureTimes )
```

## 6.9.3 Member Data Documentation

### 6.9.3.1 NO\_EVALUATED

```
double top.TOPTWGRASP.NO_EVALUATED = -1.0 [static]
```

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

- src/main/java/top/ **TOPTWGRASP.java**

## 6.10 top.TOPTWReader Class Reference

### Static Public Member Functions

- static **TOPTW** **readProblem** (String filePath)

### 6.10.1 Member Function Documentation

#### 6.10.1.1 readProblem()

```
static TOPTW top.TOPTWReader.readProblem (  
    String filePath ) [static]
```

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

- src/main/java/top/ **TOPTWReader.java**

## 6.11 top.TOPTWRoute Class Reference

### Public Member Functions

- int **getPredeccesor** ()
- int **getSuccesor** ()
- int **getId** ()
- void **setPredeccesor** (int pre)
- void **setSuccesor** (int suc)
- void **setId** (int id)

## 6.11.1 Member Function Documentation

### 6.11.1.1 getId()

```
int top.TOPTWRoute.getId ( )
```

### 6.11.1.2 getPredeccesor()

```
int top.TOPTWRoute.getPredeccesor ( )
```

### 6.11.1.3 getSuccesor()

```
int top.TOPTWRoute.getSuccesor ( )
```

### 6.11.1.4 setId()

```
void top.TOPTWRoute.setId (
    int id )
```

### 6.11.1.5 setPredeccesor()

```
void top.TOPTWRoute.setPredeccesor (
    int pre )
```

### 6.11.1.6 setSuccesor()

```
void top.TOPTWRoute.setSuccesor (
    int suc )
```

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

- src/main/java/top/ **TOPTWRoute.java**

## 6.12 top.TOPTWSolution Class Reference

### Public Member Functions

- **TOPTWSolution** ( **TOPTW** problem)
- void **initSolution** ()
- boolean **isDepot** (int c)
- boolean **isEqual** ( **TOPTWSolution** otherSolution)
- int **getAvailableVehicles** ()
- int **getCreatedRoutes** ()
- double **getDistance** (int x, int y)
- void **setAvailableVehicles** (int availableVehicles)
- int **getPredecessor** (int customer)
- int[] **getPredecessors** ()
- **TOPTW** **getProblem** ()
- double **getObjectiveFunctionValue** ()
- int **getPositionInRoute** (int customer)
- int **getSuccessor** (int customer)
- int[] **getSuccessors** ()
- int **getIndexRoute** (int index)
- double **getWaitingTime** (int customer)
- void **setObjectiveFunctionValue** (double objectiveFunctionValue)
- void **setPositionInRoute** (int customer, int position)
- void **setPredecessor** (int customer, int predecessor)
- void **setSuccessor** (int customer, int successor)
- void **setWaitingTime** (int customer, int waitingTime)
- String **getInfoSolution** ()
- double **evaluateFitness** ()
- int **addRoute** ()
- double **printSolution** ()

### Static Public Attributes

- static final int **NO\_INITIALIZED** = -1

### 6.12.1 Constructor & Destructor Documentation

#### 6.12.1.1 TOPTWSolution()

```
top.TOPTWSolution.TOPTWSolution (
    TOPTW problem )
```

### 6.12.2 Member Function Documentation



**6.12.2.1 addRoute()**

```
int top.TOPTWSolution.addRoute ( )
```

**6.12.2.2 evaluateFitness()**

```
double top.TOPTWSolution.evaluateFitness ( )
```

**6.12.2.3 getAvailableVehicles()**

```
int top.TOPTWSolution.getAvailableVehicles ( )
```

**6.12.2.4 getCreatedRoutes()**

```
int top.TOPTWSolution.getCreatedRoutes ( )
```

**6.12.2.5 getDistance()**

```
double top.TOPTWSolution.getDistance (
    int x,
    int y )
```

**6.12.2.6 getIndexRoute()**

```
int top.TOPTWSolution.getIndexRoute (
    int index )
```

**6.12.2.7 getInfoSolution()**

```
String top.TOPTWSolution.getInfoSolution ( )
```

**6.12.2.8 getObjectiveFunctionValue()**

```
double top.TOPTWSolution.getObjectiveFunctionValue ( )
```

**6.12.2.9 getPositionInRoute()**

```
int top.TOPTWSolution.getPositionInRoute (
    int customer )
```

**6.12.2.10 getPredecessor()**

```
int top.TOPTWSolution.getPredecessor (
    int customer )
```

**6.12.2.11 getPredecessors()**

```
int[] top.TOPTWSolution.getPredecessors ( )
```

**6.12.2.12 getProblem()**

```
TOPTW top.TOPTWSolution.getProblem ( )
```

**6.12.2.13 getSuccessor()**

```
int top.TOPTWSolution.getSuccessor (
    int customer )
```

**6.12.2.14 getSuccessors()**

```
int[] top.TOPTWSolution.getSuccessors ( )
```

#### 6.12.2.15 getWaitingTime()

```
double top.TOPTWSolution.getWaitingTime (
    int customer )
```

#### 6.12.2.16 initSolution()

```
void top.TOPTWSolution.initSolution ( )
```

#### 6.12.2.17 isDepot()

```
boolean top.TOPTWSolution.isDepot (
    int c )
```

#### 6.12.2.18 isEqual()

```
boolean top.TOPTWSolution.isEqual (
    TOPTWSolution otherSolution )
```

#### 6.12.2.19 printSolution()

```
double top.TOPTWSolution.printSolution ( )
```

#### 6.12.2.20 setAvailableVehicles()

```
void top.TOPTWSolution.setAvailableVehicles (
    int availableVehicles )
```

#### 6.12.2.21 setObjectiveFunctionValue()

```
void top.TOPTWSolution.setObjectiveFunctionValue (
    double objectiveFunctionValue )
```

#### 6.12.2.22 setPositionInRoute()

```
void top.TOPTWSolution.setPositionInRoute (
    int customer,
    int position )
```

#### 6.12.2.23 setPredecessor()

```
void top.TOPTWSolution.setPredecessor (
    int customer,
    int predecessor )
```

#### 6.12.2.24 setSuccessor()

```
void top.TOPTWSolution.setSuccessor (
    int customer,
    int sucesor )
```

#### 6.12.2.25 setWaitingTime()

```
void top.TOPTWSolution.setWaitingTime (
    int customer,
    int waitingTime )
```

### 6.12.3 Member Data Documentation

#### 6.12.3.1 NO\_INITIALIZED

```
final int top.TOPTWSolution.NO_INITIALIZED = -1 [static]
```

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

- src/main/java/top/ **TOPTWSolution.java**

## Chapter 7

# File Documentation

### 7.1 src/main/java/es/ull/esit/utilities/BellmanFord.java File Reference

#### Classes

- class `es.ull.esit.utilities.BellmanFord`

#### Packages

- package `es.ull.esit.utilities`

### 7.2 src/main/java/es/ull/esit/utilities/ExpositoUtilities.java File Reference

#### Classes

- class `es.ull.esit.utilities.ExpositoUtilities`

#### Packages

- package `es.ull.esit.utilities`

### 7.3 src/main/java/es/ull/esit/utilities/PowerSet.java File Reference

#### Classes

- class `es.ull.esit.utilities.PowerSet< E >`  
*Sirve para calcular todos los subconjuntos de un conjunto dado.*

#### Packages

- package `es.ull.esit.utilities`

## 7.4 src/main/java/es/ull/esit/utils/Pair.java File Reference

### Classes

- class `es.ull.esit.utils.Pair< F, S >`

### Packages

- package `es.ull.esit.utils`

## 7.5 src/main/java/top/mainTOPTW.java File Reference

### Classes

- class `top.mainTOPTW`

### Packages

- package `top`

## 7.6 src/main/java/top/TOPTW.java File Reference

### Classes

- class `top.TOPTW`

### Packages

- package `top`

## 7.7 src/main/java/top/TOPTWEvaluator.java File Reference

### Classes

- class `top.TOPTWEvaluator`

### Packages

- package `top`

## 7.8 src/main/java/top/TOPTWGRASP.java File Reference

### Classes

- class `top.TOPTWGRASP`

### Packages

- package `top`

## 7.9 src/main/java/top/TOPTWReader.java File Reference

### Classes

- class `top.TOPTWReader`

### Packages

- package `top`

## 7.10 src/main/java/top/TOPTWRoute.java File Reference

### Classes

- class `top.TOPTWRoute`

### Packages

- package `top`

## 7.11 src/main/java/top/TOPTWSolution.java File Reference

### Classes

- class `top.TOPTWSolution`

### Packages

- package `top`

## 7.12 src/test/java/es/ull/esit/AppTest.java File Reference

### Classes

- class `es.ull.esit.AppTest`

### Packages

- package `es.ull.esit`





# Index

- addNode
  - top.TOPTW, 21
- addNodeDepot
  - top.TOPTW, 22
- addRoute
  - top.TOPTWSolution, 32
- aleatorySelectionRCL
  - top.TOPTWGRASP, 28
- ALIGNMENT\_LEFT
  - es.ull.esit.utilities.ExpositoUtilities, 16
- ALIGNMENT\_RIGHT
  - es.ull.esit.utilities.ExpositoUtilities, 17
- BellmanFord
  - es.ull.esit.utilities.BellmanFord, 12
- calculateDistanceMatrix
  - top.TOPTW, 22
- comprehensiveEvaluation
  - top.TOPTWGRASP, 28
- computeGreedySolution
  - top.TOPTWGRASP, 28
- create
  - es.ull.esit.utils.Pair< F, S >, 18
- DEFAULT\_COLUMN\_WIDTH
  - es.ull.esit.utilities.ExpositoUtilities, 17
- equals
  - es.ull.esit.utils.Pair< F, S >, 18
- es.ull.esit, 9
- es.ull.esit.AppTest, 11
  - shouldAnswerWithTrue, 11
- es.ull.esit.utilities, 9
- es.ull.esit.utilities.BellmanFord, 11
  - BellmanFord, 12
  - getDistances, 12
  - getValue, 12
  - solve, 12
- es.ull.esit.utilities.ExpositoUtilities, 13
  - ALIGNMENT\_LEFT, 16
  - ALIGNMENT\_RIGHT, 17
  - DEFAULT\_COLUMN\_WIDTH, 17
  - getFormat, 13–15
  - isAcyclic, 15
  - isDouble, 15
  - isInteger, 15
  - multiplyMatrices, 16
  - printFile, 16
  - simplifyString, 16
  - therelsPath, 16
  - writeTextToFile, 16
- es.ull.esit.utilities.PowerSet< E >, 19
  - hasNext, 20
  - iterator, 20
  - next, 20
  - PowerSet, 19
  - remove, 20
- es.ull.esit.utils, 9
- es.ull.esit.utils.Pair< F, S >, 17
  - create, 18
  - equals, 18
  - first, 18
  - hashCode, 18
  - Pair, 18
  - second, 19
- evaluate
  - top.TOPTWEvaluator, 26
- evaluateFitness
  - top.TOPTWSolution, 33
- first
  - es.ull.esit.utils.Pair< F, S >, 18
- fuzzySelectionAlphaCutRCL
  - top.TOPTWGRASP, 28
- fuzzySelectionBestFDRCL
  - top.TOPTWGRASP, 28
- getAvailableVehicles
  - top.TOPTWSolution, 33
- getCreatedRoutes
  - top.TOPTWSolution, 33
- getDistance
  - top.TOPTW, 22
  - top.TOPTWSolution, 33
- getDistances
  - es.ull.esit.utilities.BellmanFord, 12
- getDueTime
  - top.TOPTW, 22
- getFormat
  - es.ull.esit.utilities.ExpositoUtilities, 13–15
- getId
  - top.TOPTWRoute, 31
- getIndexRoute
  - top.TOPTWSolution, 33
- getInfoSolution
  - top.TOPTWSolution, 33
- getMaxRoutes
  - top.TOPTW, 23
- getMaxScore

- top.TOPTWGRASP, 28
- getMaxTimePerRoute
  - top.TOPTW, 23
- getNodes
  - top.TOPTW, 23
- getObjectiveFunctionValue
  - top.TOPTWSolution, 33
- getPOIs
  - top.TOPTW, 23
- getPositionInRoute
  - top.TOPTWSolution, 34
- getPredecessor
  - top.TOPTWRoute, 31
- getPredecessor
  - top.TOPTWSolution, 34
- getPredecessors
  - top.TOPTWSolution, 34
- getProblem
  - top.TOPTWSolution, 34
- getReadyTime
  - top.TOPTW, 23
- getScore
  - top.TOPTW, 23
- getServiceTime
  - top.TOPTW, 24
- getSolution
  - top.TOPTWGRASP, 29
- getSolutionTime
  - top.TOPTWGRASP, 29
- getSuccessor
  - top.TOPTWRoute, 31
- getSuccessor
  - top.TOPTWSolution, 34
- getSuccessors
  - top.TOPTWSolution, 34
- getTime
  - top.TOPTW, 24
- getValue
  - es.ull.esit.utilities.BellmanFord, 12
- getVehicles
  - top.TOPTW, 24
- getWaitingTime
  - top.TOPTWSolution, 34
- getX
  - top.TOPTW, 24
- getY
  - top.TOPTW, 24
- GRASP
  - top.TOPTWGRASP, 29
- hashCode
  - es.ull.esit.utils.Pair< F, S >, 18
- hasNext
  - es.ull.esit.utilities.PowerSet< E >, 20
- initSolution
  - top.TOPTWSolution, 35
- isAcyclic
  - es.ull.esit.utilities.ExpositoUtilities, 15
- isDepot
  - top.TOPTW, 24
  - top.TOPTWSolution, 35
- isDouble
  - es.ull.esit.utilities.ExpositoUtilities, 15
- isEqual
  - top.TOPTWSolution, 35
- isInteger
  - es.ull.esit.utilities.ExpositoUtilities, 15
- iterator
  - es.ull.esit.utilities.PowerSet< E >, 20
- main
  - top.mainTOPTW, 17
- multiplyMatrices
  - es.ull.esit.utilities.ExpositoUtilities, 16
- next
  - es.ull.esit.utilities.PowerSet< E >, 20
- NO\_EVALUATED
  - top.TOPTWEvaluator, 27
  - top.TOPTWGRASP, 30
- NO\_INITIALIZED
  - top.TOPTWSolution, 36
- Pair
  - es.ull.esit.utils.Pair< F, S >, 18
- PowerSet
  - es.ull.esit.utilities.PowerSet< E >, 19
- printFile
  - es.ull.esit.utilities.ExpositoUtilities, 16
- printSolution
  - top.TOPTWSolution, 35
- readProblem
  - top.TOPTWReader, 30
- remove
  - es.ull.esit.utilities.PowerSet< E >, 20
- second
  - es.ull.esit.utils.Pair< F, S >, 19
- setAvailableVehicles
  - top.TOPTWSolution, 35
- setDueTime
  - top.TOPTW, 24
- setId
  - top.TOPTWRoute, 31
- setMaxRoutes
  - top.TOPTW, 25
- setMaxTimePerRoute
  - top.TOPTW, 25
- setNodes
  - top.TOPTW, 25
- setObjectiveFunctionValue
  - top.TOPTWSolution, 35
- setPositionInRoute
  - top.TOPTWSolution, 35
- setPredecessor
  - top.TOPTWRoute, 31

- setPredecessor
  - top.TOPTWSolution, 36
- setReadyTime
  - top.TOPTW, 25
- setScore
  - top.TOPTW, 25
- setServiceTime
  - top.TOPTW, 25
- setSolution
  - top.TOPTWGRASP, 29
- setSolutionTime
  - top.TOPTWGRASP, 29
- setSuccessor
  - top.TOPTWRoute, 31
- setSuccessor
  - top.TOPTWSolution, 36
- setWaitingTime
  - top.TOPTWSolution, 36
- setX
  - top.TOPTW, 26
- setY
  - top.TOPTW, 26
- shouldAnswerWithTrue
  - es.ull.esit.AppTest, 11
- simplifyString
  - es.ull.esit.utilities.ExpositoUtilities, 16
- solve
  - es.ull.esit.utilities.BellmanFord, 12
- src/main/java/es/ull/esit/utilities/BellmanFord.java, 37
- src/main/java/es/ull/esit/utilities/ExpositoUtilities.java, 37
- src/main/java/es/ull/esit/utilities/PowerSet.java, 37
- src/main/java/es/ull/esit/utlis/Pair.java, 38
- src/main/java/top/mainTOPTW.java, 38
- src/main/java/top/TOPTW.java, 38
- src/main/java/top/TOPTWEvaluator.java, 38
- src/main/java/top/TOPTWGRASP.java, 39
- src/main/java/top/TOPTWReader.java, 39
- src/main/java/top/TOPTWRoute.java, 39
- src/main/java/top/TOPTWSolution.java, 39
- src/test/java/es/ull/esit/AppTest.java, 39
- thereIsPath
  - es.ull.esit.utilities.ExpositoUtilities, 16
- top, 9
- top.mainTOPTW, 17
  - main, 17
- top.TOPTW, 21
  - addNode, 21
  - addNodeDepot, 22
  - calculateDistanceMatrix, 22
  - getDistance, 22
  - getDueTime, 22
  - getMaxRoutes, 23
  - getMaxTimePerRoute, 23
  - getNodes, 23
  - getPOIs, 23
  - getReadyTime, 23
  - getScore, 23
  - getServiceTime, 24
  - getTime, 24
  - getVehicles, 24
  - getX, 24
  - getY, 24
  - isDepot, 24
  - setDueTime, 24
  - setMaxRoutes, 25
  - setMaxTimePerRoute, 25
  - setNodes, 25
  - setReadyTime, 25
  - setScore, 25
  - setServiceTime, 25
  - setX, 26
  - setY, 26
  - TOPTW, 21
  - toString, 26
- top.TOPTWEvaluator, 26
  - evaluate, 26
  - NO\_EVALUATED, 27
- top.TOPTWGRASP, 27
  - aleatorySelectionRCL, 28
  - comprehensiveEvaluation, 28
  - computeGreedySolution, 28
  - fuzzySelectionAlphaCutRCL, 28
  - fuzzySelectionBestFDRCL, 28
  - getMaxScore, 28
  - getSolution, 29
  - getSolutionTime, 29
  - GRASP, 29
  - NO\_EVALUATED, 30
  - setSolution, 29
  - setSolutionTime, 29
  - TOPTWGRASP, 27
  - updateSolution, 29
- top.TOPTWReader, 30
  - readProblem, 30
- top.TOPTWRoute, 30
  - getId, 31
  - getPredecessor, 31
  - getSuccessor, 31
  - setId, 31
  - setPredecessor, 31
  - setSuccessor, 31
- top.TOPTWSolution, 32
  - addRoute, 32
  - evaluateFitness, 33
  - getAvailableVehicles, 33
  - getCreatedRoutes, 33
  - getDistance, 33
  - getIndexRoute, 33
  - getInfoSolution, 33
  - getObjectiveFunctionValue, 33
  - getPositionInRoute, 34
  - getPredecessor, 34
  - getPredecessors, 34
  - getProblem, 34
  - getSuccessor, 34
  - getSuccessors, 34

- getWaitingTime, 34
- initSolution, 35
- isDepot, 35
- isEqual, 35
- NO\_INITIALIZED, 36
- printSolution, 35
- setAvailableVehicles, 35
- setObjectiveFunctionValue, 35
- setPositionInRoute, 35
- setPredecessor, 36
- setSuccessor, 36
- setWaitingTime, 36
- TOPTWSolution, 32
- TOPTW
  - top.TOPTW, 21
- TOPTWGRASP
  - top.TOPTWGRASP, 27
- TOPTWSolution
  - top.TOPTWSolution, 32
- toString
  - top.TOPTW, 26
- updateSolution
  - top.TOPTWGRASP, 29
- writeTextToFile
  - es.ull.esit.utilities.ExpositoUtilities, 16