

ExpositoTOP

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1 Namespace Index	1
1.1 Package List	1
2 Hierarchical Index	3
2.1 Class Hierarchy	3
3 Class Index	5
3.1 Class List	5
4 File Index	7
4.1 File List	7
5 Namespace Documentation	9
5.1 Package es.ull.esit.utilities	9
5.2 Package es.ull.esit.utils	9
5.3 Package top	9
6 Class Documentation	11
6.1 es.ull.esit.utilities.BellmanFord Class Reference	11
6.1.1 Constructor & Destructor Documentation	11
6.1.1.1 BellmanFord()	11
6.1.2 Member Function Documentation	11
6.1.2.1 getDistances()	11
6.1.2.2 getValue()	12
6.1.2.3 solve()	12
6.2 es.ull.esit.utilities.ExpositoUtilities Class Reference	12
6.2.1 Member Function Documentation	13
6.2.1.1 getFormat() [1/12]	13
6.2.1.2 getFormat() [2/12]	13
6.2.1.3 getFormat() [3/12]	13
6.2.1.4 getFormat() [4/12]	13
6.2.1.5 getFormat() [5/12]	13
6.2.1.6 getFormat() [6/12]	13
6.2.1.7 getFormat() [7/12]	13
6.2.1.8 getFormat() [8/12]	13
6.2.1.9 getFormat() [9/12]	14
6.2.1.10 getFormat() [10/12]	14
6.2.1.11 getFormat() [11/12]	14
6.2.1.12 getFormat() [12/12]	14
6.2.1.13 isAcyclic()	14
6.2.1.14 isDouble()	14
6.2.1.15 isInteger()	14
6.2.1.16 multiplyMatrices()	14
6.2.1.17 printFile()	15

6.2.1.18 simplifyString()	15
6.2.1.19 therelsPath()	15
6.2.1.20 writeTextToFile()	15
6.2.2 Member Data Documentation	15
6.2.2.1 ALIGNMENT_LEFT	15
6.2.2.2 ALIGNMENT_RIGHT	15
6.2.2.3 DEFAULT_COLUMN_WIDTH	15
6.3 top.mainTOPTW Class Reference	15
6.3.1 Member Function Documentation	16
6.3.1.1 main()	16
6.4 es.ull.esit.utils.Pair< F, S > Class Template Reference	16
6.4.1 Constructor & Destructor Documentation	16
6.4.1.1 Pair()	16
6.4.2 Member Function Documentation	16
6.4.2.1 create()	16
6.4.2.2 equals()	17
6.4.2.3 hashCode()	17
6.4.3 Member Data Documentation	17
6.4.3.1 first	17
6.4.3.2 second	17
6.5 es.ull.esit.utilities.PowerSet< E > Class Template Reference	17
6.5.1 Constructor & Destructor Documentation	17
6.5.1.1 PowerSet()	17
6.5.2 Member Function Documentation	18
6.5.2.1 hasNext()	18
6.5.2.2 iterator()	18
6.5.2.3 next()	18
6.5.2.4 remove()	18
6.6 top.TOPTW Class Reference	18
6.6.1 Constructor & Destructor Documentation	19
6.6.1.1 TOPTW()	19
6.6.2 Member Function Documentation	19
6.6.2.1 addNode()	19
6.6.2.2 addNodeDepot()	19
6.6.2.3 calculateDistanceMatrix()	19
6.6.2.4 getDistance() [1 / 4]	19
6.6.2.5 getDistance() [2 / 4]	19
6.6.2.6 getDistance() [3 / 4]	20
6.6.2.7 getDistance() [4 / 4]	20
6.6.2.8 getDueTime()	20
6.6.2.9 getMaxRoutes()	20
6.6.2.10 getMaxTimePerRoute()	20

6.6.2.11	getNodes()	20
6.6.2.12	getPOIs()	20
6.6.2.13	getReadyTime()	20
6.6.2.14	getScore() [1/2]	20
6.6.2.15	getScore() [2/2]	21
6.6.2.16	getServiceTime()	21
6.6.2.17	getTime()	21
6.6.2.18	getVehicles()	21
6.6.2.19	getX()	21
6.6.2.20	getY()	21
6.6.2.21	isDepot()	21
6.6.2.22	setDueTime()	21
6.6.2.23	setMaxRoutes()	21
6.6.2.24	setMaxTimePerRoute()	22
6.6.2.25	setNodes()	22
6.6.2.26	setReadyTime()	22
6.6.2.27	setScore()	22
6.6.2.28	setServiceTime()	22
6.6.2.29	setX()	22
6.6.2.30	setY()	22
6.6.2.31	toString()	22
6.7	top.TOPTWEvaluator Class Reference	23
6.7.1	Member Function Documentation	23
6.7.1.1	evaluate()	23
6.7.2	Member Data Documentation	23
6.7.2.1	NO_EVALUATED	23
6.8	top.TOPTWGRASP Class Reference	23
6.8.1	Constructor & Destructor Documentation	24
6.8.1.1	TOPTWGRASP()	24
6.8.2	Member Function Documentation	24
6.8.2.1	aleatorySelectionRCL()	24
6.8.2.2	comprehensiveEvaluation()	24
6.8.2.3	computeGreedySolution()	24
6.8.2.4	fuzzySelectionAlphaCutRCL()	24
6.8.2.5	fuzzySelectionBestFDRCL()	24
6.8.2.6	getMaxScore()	24
6.8.2.7	getSolution()	25
6.8.2.8	getSolutionTime()	25
6.8.2.9	GRASP()	25
6.8.2.10	setSolution()	25
6.8.2.11	setSolutionTime()	25
6.8.2.12	updateSolution()	25

6.8.3 Member Data Documentation	25
6.8.3.1 NO_EVALUATED	25
6.9 top.TOPTWReader Class Reference	25
6.9.1 Member Function Documentation	26
6.9.1.1 readProblem()	26
6.10 top.TOPTWRoute Class Reference	26
6.10.1 Member Function Documentation	26
6.10.1.1 getId()	26
6.10.1.2 getPredecessor()	26
6.10.1.3 getSuccessor()	26
6.10.1.4 setId()	26
6.10.1.5 setPredecessor()	26
6.10.1.6 setSuccessor()	27
6.11 top.TOPTWSolution Class Reference	27
6.11.1 Constructor & Destructor Documentation	27
6.11.1.1 TOPTWSolution()	27
6.11.2 Member Function Documentation	28
6.11.2.1 addRoute()	28
6.11.2.2 evaluateFitness()	28
6.11.2.3 getAvailableVehicles()	28
6.11.2.4 getCreatedRoutes()	28
6.11.2.5 getDistance()	28
6.11.2.6 getIndexRoute()	28
6.11.2.7 getInfoSolution()	28
6.11.2.8 getObjectiveFunctionValue()	28
6.11.2.9 getPositionInRoute()	28
6.11.2.10 getPredecessor()	29
6.11.2.11 getPredecessors()	29
6.11.2.12 getProblem()	29
6.11.2.13 getSuccessor()	29
6.11.2.14 getSuccessors()	29
6.11.2.15 getWaitingTime()	29
6.11.2.16 initSolution()	29
6.11.2.17 isDepot()	29
6.11.2.18 isEqual()	29
6.11.2.19 printSolution()	30
6.11.2.20 setAvailableVehicles()	30
6.11.2.21 setObjectiveFunctionValue()	30
6.11.2.22 setPositionInRoute()	30
6.11.2.23 setPredecessor()	30
6.11.2.24 setSuccessor()	30
6.11.2.25 setWaitingTime()	30

6.11.3 Member Data Documentation	30
6.11.3.1 NO_INITIALIZED	30
7 File Documentation	31
7.1 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/BellmanFord.java File Reference	31
7.2 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/ExpositoUtilities.java File Reference	31
7.3 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/PowerSet.java File Reference	32
7.4 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utills/Pair.java File Reference	32
7.5 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/mainTOPTW.java File Reference	32
7.6 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTW.java File Reference	32
7.7 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWEvaluator.java File Reference	33
7.8 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWGRASP.java File Reference	33
7.9 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWReader.java File Reference	33
7.10 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWRoute.java File Reference	34
7.11 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWSolution.java File Reference	34
Index	35

Chapter 1

Namespace Index

1.1 Package List

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

es.ull.esit.utilities	9
es.ull.esit.utils	9
top	9

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

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

es.ull.esit.utilities.BellmanFord	11
es.ull.esit.utilities.ExpositoUtilities	12
Iterable	
es.ull.esit.utilities.PowerSet< E >	17
Iterator	
es.ull.esit.utilities.PowerSet< E >	17
top.mainTOPTW	15
es.ull.esit.utils.Pair< F, S >	16
top.TOPTW	18
top.TOPTWEvaluator	23
top.TOPTWGRASP	23
top.TOPTWReader	25
top.TOPTWRoute	26
top.TOPTWSolution	27

Chapter 3

Class Index

3.1 Class List

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

es.ull.esit.utilities.BellmanFord	11
es.ull.esit.utilities.ExpositoUtilities	12
top.mainTOPTW	15
es.ull.esit.utls.Pair< F, S >	16
es.ull.esit.utilities.PowerSet< E >	17
top.TOPTW	18
top.TOPTWEvaluator	23
top.TOPTWGRASP	23
top.TOPTWReader	25
top.TOPTWRoute	26
top.TOPTWSolution	27

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/BellmanFord.java	31
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/ExpositoUtilities.java	31
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/PowerSet.java	32
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utills/Pair.java	32
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/mainTOPTW.java	32
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTW.java	32
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWEvaluator.java	33
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWGRASP.java	33
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWReader.java	33
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWRoute.java	34
C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWSolution.java	34

Chapter 5

Namespace Documentation

5.1 Package es.ull.esit.utilities

Classes

- class [BellmanFord](#)
- class [ExpositoUtilities](#)
- class [PowerSet](#)

5.2 Package es.ull.esit.utils

Classes

- class [Pair](#)

5.3 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.utilities.BellmanFord Class Reference

Public Member Functions

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

6.1.1 Constructor & Destructor Documentation

6.1.1.1 BellmanFord()

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

Parameters

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

6.1.2 Member Function Documentation

6.1.2.1 getDistances()

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

Returns

6.1.2.2 getValue()

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

Returns

6.1.2.3 solve()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/[BellmanFord.java](#)

6.2 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

6.2.1 Member Function Documentation

6.2.1.1 getFormat() [1/12]

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

6.2.1.2 getFormat() [2/12]

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

6.2.1.3 getFormat() [3/12]

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

6.2.1.4 getFormat() [4/12]

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

6.2.1.5 getFormat() [5/12]

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

6.2.1.6 getFormat() [6/12]

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

6.2.1.7 getFormat() [7/12]

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

6.2.1.8 getFormat() [8/12]

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

6.2.1.9 getFormat() [9/12]

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

6.2.1.10 getFormat() [10/12]

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

6.2.1.11 getFormat() [11/12]

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

6.2.1.12 getFormat() [12/12]

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

6.2.1.13 isAcyclic()

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

6.2.1.14 isDouble()

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

6.2.1.15 isInteger()

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

6.2.1.16 multiplyMatrices()

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

6.2.1.17 printFile()

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

6.2.1.18 simplifyString()

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

6.2.1.19 thereIsPath()

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

6.2.1.20 writeTextToFile()

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

6.2.2 Member Data Documentation

6.2.2.1 ALIGNMENT_LEFT

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

6.2.2.2 ALIGNMENT_RIGHT

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

6.2.2.3 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:

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/[ExpositoUtilities.java](#)

6.3 top.mainTOPTW Class Reference

Static Public Member Functions

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

6.3.1 Member Function Documentation

6.3.1.1 main()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[mainTOPTW.java](#)

6.4 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](#)

6.4.1 Constructor & Destructor Documentation

6.4.1.1 Pair()

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

6.4.2 Member Function Documentation

6.4.2.1 create()

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


6.4.2.2 equals()

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

6.4.2.3 hashCode()

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

6.4.3 Member Data Documentation

6.4.3.1 first

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

6.4.3.2 second

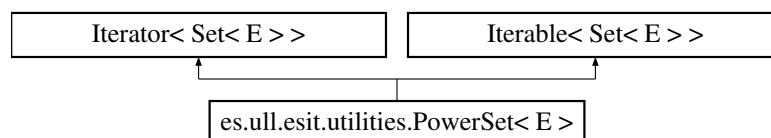
```
final S es.ull.esit.utils.Pair< F, S >.second
```

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utils/[Pair.java](#)

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

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](#) ()

6.5.1 Constructor & Destructor Documentation

6.5.1.1 PowerSet()

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

6.5.2 Member Function Documentation

6.5.2.1 hasNext()

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

6.5.2.2 iterator()

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

6.5.2.3 next()

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

6.5.2.4 remove()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/[PowerSet.java](#)

6.6 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](#) ()

6.6.1 Constructor & Destructor Documentation

6.6.1.1 TOPTW()

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

6.6.2 Member Function Documentation

6.6.2.1 addNode()

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

6.6.2.2 addNodeDepot()

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

6.6.2.3 calculateDistanceMatrix()

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

6.6.2.4 getDistance() [1/4]

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

6.6.2.5 getDistance() [2/4]

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

6.6.2.6 getDistance() [3/4]

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

6.6.2.7 getDistance() [4/4]

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

6.6.2.8 getDueTime()

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

6.6.2.9 getMaxRoutes()

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

6.6.2.10 getMaxTimePerRoute()

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

6.6.2.11 getNodes()

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

6.6.2.12 getPOIs()

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

6.6.2.13 getReadyTime()

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

6.6.2.14 getScore() [1/2]

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

6.6.2.15 getScore() [2/2]

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

6.6.2.16 getServiceTime()

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

6.6.2.17 getTime()

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

6.6.2.18 getVehicles()

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

6.6.2.19 getX()

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

6.6.2.20 getY()

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

6.6.2.21 isDepot()

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

6.6.2.22 setDueTime()

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

6.6.2.23 setMaxRoutes()

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

6.6.2.24 setMaxTimePerRoute()

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

6.6.2.25 setNodes()

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

6.6.2.26 setReadyTime()

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

6.6.2.27 setScore()

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

6.6.2.28 setServiceTime()

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

6.6.2.29 setX()

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

6.6.2.30 setY()

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

6.6.2.31 toString()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTW.java](#)

6.7 top.OPTWEvaluator Class Reference

Public Member Functions

- void [evaluate](#) ([TOPTWSolution](#) solution)

Static Public Attributes

- static double [NO_EVALUATED](#) = -1.0

6.7.1 Member Function Documentation

6.7.1.1 evaluate()

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

6.7.2 Member Data Documentation

6.7.2.1 NO_EVALUATED

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTWEvaluator.java](#)

6.8 top.OPTWGRASP 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

6.8.1 Constructor & Destructor Documentation

6.8.1.1 TOPTWGRASP()

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

6.8.2 Member Function Documentation

6.8.2.1 aleatorySelectionRCL()

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

6.8.2.2 comprehensiveEvaluation()

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

6.8.2.3 computeGreedySolution()

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

6.8.2.4 fuzzySelectionAlphaCutRCL()

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

6.8.2.5 fuzzySelectionBestFDRCL()

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

6.8.2.6 getMaxScore()

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


6.8.2.7 getSolution()

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

6.8.2.8 getSolutionTime()

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

6.8.2.9 GRASP()

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

6.8.2.10 setSolution()

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

6.8.2.11 setSolutionTime()

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

6.8.2.12 updateSolution()

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

6.8.3 Member Data Documentation

6.8.3.1 NO_EVALUATED

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTWGRASP.java](#)

6.9 top.TOPTWReader Class Reference

Static Public Member Functions

- static [TOPTW readProblem](#) (String filePath)

6.9.1 Member Function Documentation

6.9.1.1 readProblem()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTWReader.java](#)

6.10 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)

6.10.1 Member Function Documentation

6.10.1.1 getId()

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

6.10.1.2 getPredeccesor()

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

6.10.1.3 getSuccesor()

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

6.10.1.4 setId()

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

6.10.1.5 setPredeccesor()

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

6.10.1.6 setSucesor()

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTWRoute.java](#)

6.11 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 sucesor)
- void [setWaitingTime](#) (int customer, int waitingTime)
- String [getInfoSolution](#) ()
- double [evaluateFitness](#) ()
- int [addRoute](#) ()
- double [printSolution](#) ()

Static Public Attributes

- static final int [NO_INITIALIZED](#) = -1

6.11.1 Constructor & Destructor Documentation

6.11.1.1 TOPTWSolution()

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

6.11.2 Member Function Documentation

6.11.2.1 addRoute()

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

6.11.2.2 evaluateFitness()

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

6.11.2.3 getAvailableVehicles()

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

6.11.2.4 getCreatedRoutes()

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

6.11.2.5 getDistance()

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

6.11.2.6 getIndexRoute()

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

6.11.2.7 getInfoSolution()

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

6.11.2.8 getObjectiveFunctionValue()

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

6.11.2.9 getPositionInRoute()

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

6.11.2.10 getPredecessor()

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

6.11.2.11 getPredecessors()

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

6.11.2.12 getProblem()

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

6.11.2.13 getSuccessor()

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

6.11.2.14 getSuccessors()

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

6.11.2.15 getWaitingTime()

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

6.11.2.16 initSolution()

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

6.11.2.17 isDepot()

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

6.11.2.18 isEqual()

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

6.11.2.19 printSolution()

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

6.11.2.20 setAvailableVehicles()

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

6.11.2.21 setObjectiveFunctionValue()

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

6.11.2.22 setPositionInRoute()

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

6.11.2.23 setPredecessor()

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

6.11.2.24 setSuccessor()

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

6.11.2.25 setWaitingTime()

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

6.11.3 Member Data Documentation

6.11.3.1 NO_INITIALIZED

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

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

- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/[TOPTWSolution.java](#)

Chapter 7

File Documentation

7.1 C:/Users/Rebeca/Desktop/Exposito↵ TOP/src/main/java/es/ull/esit/utilities/BellmanFord.java File Reference

```
import java.util.ArrayList;
```

Classes

- class [es.ull.esit.utilities.BellmanFord](#)

Packages

- package [es.ull.esit.utilities](#)

7.2 C:/Users/Rebeca/Desktop/Exposito↵ TOP/src/main/java/es/ull/esit/utilities/ExpositoUtilities.java File Reference

```
import java.io.BufferedReader;
```

Classes

- class [es.ull.esit.utilities.ExpositoUtilities](#)

Packages

- package [es.ull.esit.utilities](#)

7.3 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utilities/PowerSet.java File Reference

```
import java.util.BitSet;
```

Classes

- class [es.ull.esit.utilities.PowerSet< E >](#)

Packages

- package [es.ull.esit.utilities](#)

7.4 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utills/Pair.java File Reference

```
import java.util.Objects;
```

Classes

- class [es.ull.esit.utills.Pair< F, S >](#)

Packages

- package [es.ull.esit.utills](#)

7.5 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/mainTOPTW.java File Reference

Classes

- class [top.mainTOPTW](#)

Packages

- package [top](#)

7.6 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/topTOPTW.java File Reference

```
import java.util.ArrayList;
```


Classes

- class [top.TOPTW](#)

Packages

- package [top](#)

7.7 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/↵ TOPTWEvaluator.java File Reference

Classes

- class [top.TOPTWEvaluator](#)

Packages

- package [top](#)

7.8 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/↵ TOPTWGRASP.java File Reference

```
import java.security.SecureRandom;
```

Classes

- class [top.TOPTWGRASP](#)

Packages

- package [top](#)

7.9 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/↵ TOPTWReader.java File Reference

```
import java.io.BufferedReader;
```

Classes

- class [top.TOPTWReader](#)

Packages

- package [top](#)

7.10 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/↵ TOPTWRoute.java File Reference

Classes

- class [top.TOPTWRoute](#)

Packages

- package [top](#)

7.11 C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/↵ TOPTWSolution.java File Reference

```
import java.util.Arrays;
```

Classes

- class [top.TOPTWSolution](#)

Packages

- package [top](#)

Index

- addNode
 - top.TOPTW, 19
- addNodeDepot
 - top.TOPTW, 19
- addRoute
 - top.TOPTWSolution, 28
- aleatorySelectionRCL
 - top.TOPTWGRASP, 24
- ALIGNMENT_LEFT
 - es.ull.esit.utilities.ExpositoUtilities, 15
- ALIGNMENT_RIGHT
 - es.ull.esit.utilities.ExpositoUtilities, 15
- BellmanFord
 - es.ull.esit.utilities.BellmanFord, 11
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utlities/BellmanFord.java, 31
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utlities/ExpositoUtilities.java, 31
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utlities/PowerSet.java, 32
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/es/ull/esit/utlities/Pair.java, 32
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/main/TOPTW.java, 32
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTW.java, 32
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWEvaluator.java, 33
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWGRASP.java, 33
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWHeader.java, 33
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWRoute.java, 34
- C:/Users/Rebeca/Desktop/ExpositoTOP/src/main/java/top/TOPTWSolution.java, 34
- calculateDistanceMatrix
 - top.TOPTW, 19
- comprehensiveEvaluation
 - top.TOPTWGRASP, 24
- computeGreedySolution
 - top.TOPTWGRASP, 24
- create
 - es.ull.esit.utlities.Pair< F, S >, 16
- DEFAULT_COLUMN_WIDTH
 - es.ull.esit.utilities.ExpositoUtilities, 15
- equals
 - es.ull.esit.utlities.Pair< F, S >, 16
- es.ull.esit.utilities, 9
- es.ull.esit.utilities.BellmanFord, 11
- BellmanFord, 11
- getDistances, 11
- getValue, 11
- solve, 12
- es.ull.esit.utilities.ExpositoUtilities, 12
- ALIGNMENT_LEFT, 15
- ALIGNMENT_RIGHT, 15
- DEFAULT_COLUMN_WIDTH, 15
- getFormat, 13, 14
- isAcyclic, 14
- isDouble, 14
- isInteger, 14
- multiplyMatrices, 14
- printFile, 14
- simplifyString, 15
- thereIsPath, 15
- writeTextToFile, 15
- es.ull.esit.utilities.PowerSet< E >, 17
- hasNext, 18
- iterator, 18
- next, 18
- PowerSet, 17
- remove, 18
- es.ull.esit.utlities, 9
- es.ull.esit.utlities.Pair< F, S >, 16
- create, 16
- equals, 16
- first, 17
- hashCode, 17
- Pair, 16
- second, 17
- evaluate
- top.TOPTWEvaluator, 23
- top.TOPTWSolution.java, evaluateFitness
- top.TOPTWSolution, 28
- first
 - es.ull.esit.utlities.Pair< F, S >, 17
- fuzzySelectionAlphaCutRCL
 - top.TOPTWGRASP, 24
- fuzzySelectionBestFDRCL
 - top.TOPTWGRASP, 24
- getAvailableVehicles
 - top.TOPTWSolution, 28
- getCreatedRoutes
 - top.TOPTWSolution, 28

- getDistance
 - top.TOPTW, [19, 20](#)
 - top.TOPTWSolution, [28](#)
- getDistances
 - es.ull.esit.utilities.BellmanFord, [11](#)
- getDueTime
 - top.TOPTW, [20](#)
- getFormat
 - es.ull.esit.utilities.ExpositoUtilities, [13, 14](#)
- getId
 - top.TOPTWRoute, [26](#)
- getIndexRoute
 - top.TOPTWSolution, [28](#)
- getInfoSolution
 - top.TOPTWSolution, [28](#)
- getMaxRoutes
 - top.TOPTW, [20](#)
- getMaxScore
 - top.TOPTWGRASP, [24](#)
- getMaxTimePerRoute
 - top.TOPTW, [20](#)
- getNodes
 - top.TOPTW, [20](#)
- getObjectiveFunctionValue
 - top.TOPTWSolution, [28](#)
- getPOIs
 - top.TOPTW, [20](#)
- getPositionInRoute
 - top.TOPTWSolution, [28](#)
- getPredecessor
 - top.TOPTWRoute, [26](#)
- getPredecessor
 - top.TOPTWSolution, [28](#)
- getPredecessors
 - top.TOPTWSolution, [29](#)
- getProblem
 - top.TOPTWSolution, [29](#)
- getReadyTime
 - top.TOPTW, [20](#)
- getScore
 - top.TOPTW, [20](#)
- getServiceTime
 - top.TOPTW, [21](#)
- getSolution
 - top.TOPTWGRASP, [24](#)
- getSolutionTime
 - top.TOPTWGRASP, [25](#)
- getSuccessor
 - top.TOPTWRoute, [26](#)
- getSuccessor
 - top.TOPTWSolution, [29](#)
- getSuccessors
 - top.TOPTWSolution, [29](#)
- getTime
 - top.TOPTW, [21](#)
- getValue
 - es.ull.esit.utilities.BellmanFord, [11](#)
- getVehicles
 - top.TOPTW, [21](#)
- getWaitingTime
 - top.TOPTWSolution, [29](#)
- getX
 - top.TOPTW, [21](#)
- getY
 - top.TOPTW, [21](#)
- GRASP
 - top.TOPTWGRASP, [25](#)
- hashCode
 - es.ull.esit.utils.Pair< F, S >, [17](#)
- hasNext
 - es.ull.esit.utilities.PowerSet< E >, [18](#)
- initSolution
 - top.TOPTWSolution, [29](#)
- isAcyclic
 - es.ull.esit.utilities.ExpositoUtilities, [14](#)
- isDepot
 - top.TOPTW, [21](#)
 - top.TOPTWSolution, [29](#)
- isDouble
 - es.ull.esit.utilities.ExpositoUtilities, [14](#)
- isEqual
 - top.TOPTWSolution, [29](#)
- isInteger
 - es.ull.esit.utilities.ExpositoUtilities, [14](#)
- iterator
 - es.ull.esit.utilities.PowerSet< E >, [18](#)
- main
 - top.mainTOPTW, [16](#)
- multiplyMatrices
 - es.ull.esit.utilities.ExpositoUtilities, [14](#)
- next
 - es.ull.esit.utilities.PowerSet< E >, [18](#)
- NO_EVALUATED
 - top.TOPTWEvaluator, [23](#)
 - top.TOPTWGRASP, [25](#)
- NO_INITIALIZED
 - top.TOPTWSolution, [30](#)
- Pair
 - es.ull.esit.utils.Pair< F, S >, [16](#)
- PowerSet
 - es.ull.esit.utilities.PowerSet< E >, [17](#)
- printFile
 - es.ull.esit.utilities.ExpositoUtilities, [14](#)
- printSolution
 - top.TOPTWSolution, [29](#)
- readProblem
 - top.TOPTWReader, [26](#)
- remove
 - es.ull.esit.utilities.PowerSet< E >, [18](#)
- second
 - es.ull.esit.utils.Pair< F, S >, [17](#)

- setAvailableVehicles
 - top.TOPTWSolution, 30
- setDueTime
 - top.TOPTW, 21
- setId
 - top.TOPTWRoute, 26
- setMaxRoutes
 - top.TOPTW, 21
- setMaxTimePerRoute
 - top.TOPTW, 21
- setNodes
 - top.TOPTW, 22
- setObjectiveFunctionValue
 - top.TOPTWSolution, 30
- setPositionInRoute
 - top.TOPTWSolution, 30
- setPredecessor
 - top.TOPTWRoute, 26
- setPredecessor
 - top.TOPTWSolution, 30
- setReadyTime
 - top.TOPTW, 22
- setScore
 - top.TOPTW, 22
- setServiceTime
 - top.TOPTW, 22
- setSolution
 - top.TOPTWGRASP, 25
- setSolutionTime
 - top.TOPTWGRASP, 25
- setSuccessor
 - top.TOPTWRoute, 26
- setSuccessor
 - top.TOPTWSolution, 30
- setWaitingTime
 - top.TOPTWSolution, 30
- setX
 - top.TOPTW, 22
- setY
 - top.TOPTW, 22
- simplifyString
 - es.ull.esit.utilities.ExpositoUtilities, 15
- solve
 - es.ull.esit.utilities.BellmanFord, 12
- thereIsPath
 - es.ull.esit.utilities.ExpositoUtilities, 15
- top, 9
- top.mainTOPTW, 15
 - main, 16
- top.TOPTW, 18
 - addNode, 19
 - addNodeDepot, 19
 - calculateDistanceMatrix, 19
 - getDistance, 19, 20
 - getDueTime, 20
 - getMaxRoutes, 20
 - getMaxTimePerRoute, 20
 - getNodes, 20
 - getPOIs, 20
 - getReadyTime, 20
 - getScore, 20
 - getServiceTime, 21
 - getTime, 21
 - getVehicles, 21
 - getX, 21
 - getY, 21
 - isDepot, 21
 - setDueTime, 21
 - setMaxRoutes, 21
 - setMaxTimePerRoute, 21
 - setNodes, 22
 - setReadyTime, 22
 - setScore, 22
 - setServiceTime, 22
 - setX, 22
 - setY, 22
 - TOPTW, 19
 - toString, 22
- top.TOPTWEvaluator, 23
 - evaluate, 23
 - NO_EVALUATED, 23
- top.TOPTWGRASP, 23
 - aleatorySelectionRCL, 24
 - comprehensiveEvaluation, 24
 - computeGreedySolution, 24
 - fuzzySelectionAlphaCutRCL, 24
 - fuzzySelectionBestFDRCL, 24
 - getMaxScore, 24
 - getSolution, 24
 - getSolutionTime, 25
 - GRASP, 25
 - NO_EVALUATED, 25
 - setSolution, 25
 - setSolutionTime, 25
 - TOPTWGRASP, 24
 - updateSolution, 25
- top.TOPTWReader, 25
 - readProblem, 26
- top.TOPTWRoute, 26
 - getId, 26
 - getPredecessor, 26
 - getSuccessor, 26
 - setId, 26
 - setPredecessor, 26
 - setSuccessor, 26
- top.TOPTWSolution, 27
 - addRoute, 28
 - evaluateFitness, 28
 - getAvailableVehicles, 28
 - getCreatedRoutes, 28
 - getDistance, 28
 - getIndexRoute, 28
 - getInfoSolution, 28
 - getObjectiveFunctionValue, 28
 - getPositionInRoute, 28
 - getPredecessor, 28

- getPredecessors, [29](#)
- getProblem, [29](#)
- getSuccessor, [29](#)
- getSuccessors, [29](#)
- getWaitingTime, [29](#)
- initSolution, [29](#)
- isDepot, [29](#)
- isEqual, [29](#)
- NO_INITIALIZED, [30](#)
- printSolution, [29](#)
- setAvailableVehicles, [30](#)
- setObjectiveFunctionValue, [30](#)
- setPositionInRoute, [30](#)
- setPredecessor, [30](#)
- setSuccessor, [30](#)
- setWaitingTime, [30](#)
- TOPTWSolution, [27](#)
- TOPTW
 - top.TOPTW, [19](#)
- TOPTWGRASP
 - top.TOPTWGRASP, [24](#)
- TOPTWSolution
 - top.TOPTWSolution, [27](#)
- toString
 - top.TOPTW, [22](#)
- updateSolution
 - top.TOPTWGRASP, [25](#)
- writeTextToFile
 - es.ull.esit.utilities.ExpositoUtilities, [15](#)