Utility Class

This class contains utility functions that will be used throughout all libraries, such as random number generator (RNG), print vector and more. All the functions in this class are Static, and it is useful to indicate to future users where a function comes from.

Public Static Functions

- randomInt( )

```
int Utility::randomInt ( const int min,
                         const int max
                       )
```

Generates a random integer between ‘min’ and ‘max’, limits included

Parameters

min is the minimum value for RNG
max is the maximum value for RNG

- distPoints( )

```
double Utility::distPoints ( const Point & p1,
                             const Point & p2
                           )
```

Calculates the euclidean distance between points ‘p1’ and ‘p2’

Parameters

p1 is the first point
p2 is the second point

- calcSumDist( )

```
double Utility::calcSumDist ( const std::vector<Point> & vec_p,
                              const double a,
                              const double b
                            )
```

Calculates the sum of euclidean distances between all points inside ‘vec_p’ and the line defined by y = ‘a’x + ‘b’ using formula $\sum_{i=1}^{n} \frac{|ax_i - y_i + b|}{\sqrt{a^2+1}}$

Parameters

vec_p is the vector containing all the points
a is the line’s slope
b is the line’s intercept

- printInColor( )

```
void Utility::printInColor ( const std::string msg,
                             const int color,
                           )
```

Prints a message in terminal with color changed to ‘color’. Use BLUE, RED and CYAN for predetermined colors. Go to https://askubuntu.com/questions/27314/script-to-display-all-terminal-colors for more information.

Parameters

msg is the message to be printed
color is the chosen color

- randomDiffVector( )

```
std::vector<int> Utility::randomDiffVector ( const int min,
                                             const int max,
                                             const int size
                                           )
```

Generates a vector of size ‘size’ containing different random integers from ‘min’ to ‘max’, limits included. This function will return an error if the number of possible numbers is smaller than ‘size’.

Parameters

min is the minimum value for RNG
max is the maximum value for RNG
size is the amount of random numbers to be generated

- template < class T> getClassName( )

```
std::string Utility::getClassName ( const T & element )
```

Gets ‘element’ class’ name

Parameters

element is the object you want to find the class name

- template < class T> printVector( )

```
void Utility::printVector ( const std::vector<T> & vec )
```

Prints a vector of any type to the terminal.

Parameters

vec is the vector to be printed

- template < class T> findIndex( )

```
int Utility::findIndex ( const std::vector<T> & vec,
                         const T element
)
```

Finds an element inside a vector returning its position or -10^{20} if not found.

Parameters

vec is the vector to be searched
element is the searched object or value