# sHexDist

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sHexDist | *Function to calculate distances between hexagons/rectangles in a 2D grid*

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### Description

sHexDist is supposed to calculate euclidian distances between each pair of hexagons/rectangles in a 2D grid of input "sTopol" or "sMap" object. It returns a symmetric matrix containing pairwise distances.

### Usage

```
sHexDist(sObj)
```

### Arguments

sObj            an object of class "sTopol" or "sInit" or "sMap"

### Value

- dist: a symmetric matrix of nHex x nHex, containing pairwise distances, where nHex is the total number of hexagons/rectanges in the grid

### Note

The return matrix has rows/columns ordered in the same order as the "coord" matrix of the input object does.

### See Also

sTopology, sInitial

## Examples

```
# 1) generate an iid normal random matrix of 100x10
data <- matrix( rnorm(100*10,mean=0,sd=1), nrow=100, ncol=10)

# 2) from this input matrix, determine nHex=5*sqrt(nrow(data))=50,
# but it returns nHex=61, via "sHexGrid(nHex=50)", to make sure a supra-hexagonal grid
sTopol <- sTopology(data=data, lattice="hexa", shape="suprahex")

# 3) initialise the codebook matrix using "uniform" method
sI <- sInitial(data=data, sTopol=sTopol, init="uniform")

# 4) calculate distances between hexagons/rectangles in a 2D grid based on different objects
# 4a) based on an object of class "sTopol"
dist <- sHexDist(sObj=sTopol)
# 4b) based on an object of class "sMap"
dist <- sHexDist(sObj=sI)
```