BIOS 6312 Project

Optimal non-bipartite matching

Yi Zuo

Vanderbilt University

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Outline

1. Distance
   - Scalar Distance
   - Mahalnobis Distance
2. Matches

scalar.dist function

Absolute distance between points

```
> scalar.dist(1:6)
[,1] [,2] [,3] [,4] [,5] [,6]
[1,]    0    1    2    3    4    5
[2,]    1    0    1    2    3    4
[3,]    2    1    0    1    2    3
[4,]    3    2    1    0    1    2
[5,]    4    3    2    1    0    1
[6,]    5    4    3    2    1    0
```

gendistance function

Distance accounts for covariance matrix

```
> gendistance(data.frame(age=c(90,84,91,88,73,82), strokes=c(2
1          2          3          4          5          6
1       Inf 1.2688722 1.402429 1.495769 2.546227 1.4149526
2 1.268872       Inf 1.159632 2.436866 1.822279 0.3313234
3 1.402429 1.1596320       Inf 2.894964 2.981911 1.4909555
4 1.495769 2.4368662 2.894964       Inf 2.744809 2.3946709
5 2.546227 1.8222789 2.981911 2.744809       Inf 1.4909555
6 1.414953 0.3313234 1.490955 2.394671 1.490955       Inf
```

Matching

yay matching

Warning

duck!

Definition

the dictionary defines this as defined

Example

this was supposed to be an example

Theorem

Distance $a^2 + b^2 = c^2$

$$\sqrt{(y_0 - y_1)^2 + (x_0 - x_1)^2}$$

gendistance function

gendistance returns a bunch of stuff, in a list

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- Covariates data set

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- Covariates data set
- Distance matrix

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gendistance returns a bunch of stuff, in a list

- Covariates data set
- Distance matrix
- things...

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Matched Records

Group1.ID	Group1.Row	Group2.ID	Group2.Row	Distance
1	1	4	4	1.495769

Table: Matching Results

Matched Records

Group1.ID	Group1.Row	Group2.ID	Group2.Row	Distance
2	2	3	3	1.159632

Table: Matching Results

Matched Records

Group1.ID	Group1.Row	Group2.ID	Group2.Row	Distance
5	5	6	6	1.490955

Table: Matching Results

Matched Records

Group1.ID	Group1.Row	Group2.ID	Group2.Row	Distance
1	1	4	4	1.495769
2	2	3	3	1.159632
5	5	6	6	1.490955

Table: Matching Results