Spatial assignment of test sample

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Input

Website Identifier: 93

Isotope values of test sample

Table 1: Isotope values of test sample

<table>
<thead>
<tr>
<th></th>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-25.8</td>
<td>10.2</td>
<td>17.2</td>
<td>-44.2</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Output

Model

##

## Call:

```r
train.kknn(formula = fmla, data = ivory.train, kmax = 15, distance = 2, kernel = knl)
```

##

## Type of response variable: nominal

## Minimal misclassification: 0.3765867

## Best kernel: triangular

## Best k: 15

Classifier: country_code
Map of best fitted reference sample

Best fitted reference sample:

- Country: CD
- Region: Central Africa
- CITES: Appendix I
- Lat: -0.082275
- Lon: 14.573353
Assignment of test sample to nearest neighbours

![Graph showing Euclidian distance vs Weight of k-NN](image)

**Best fitted reference entries**

Table 2: Details of best fitted reference entry (row 1) and other fitted entries within best classifier

<table>
<thead>
<tr>
<th>lon</th>
<th>lat</th>
<th>location</th>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.57</td>
<td>-0.08</td>
<td>Dem. Rep. Congo</td>
<td>-24.9</td>
<td>10.3</td>
<td>16.4</td>
<td>-49.5</td>
<td>10.0</td>
</tr>
<tr>
<td>14.47</td>
<td>-0.01</td>
<td>Dem. Rep. Congo</td>
<td>-25.0</td>
<td>10.2</td>
<td>15.8</td>
<td>-49.9</td>
<td>10.1</td>
</tr>
<tr>
<td>17.11</td>
<td>-1.10</td>
<td>Dem. Rep. Congo, Lukolela</td>
<td>-24.8</td>
<td>10.5</td>
<td>15.4</td>
<td>-43.4</td>
<td>8.4</td>
</tr>
<tr>
<td>21.45</td>
<td>-1.00</td>
<td>Dem. Rep. Congo, Itoko</td>
<td>-24.2</td>
<td>10.2</td>
<td>16.9</td>
<td>-42.9</td>
<td>6.8</td>
</tr>
<tr>
<td>23.55</td>
<td>-1.35</td>
<td>Dem. Rep. Congo, Moma</td>
<td>-25.6</td>
<td>10.8</td>
<td>16.9</td>
<td>-44.4</td>
<td>5.7</td>
</tr>
<tr>
<td>27.37</td>
<td>1.40</td>
<td>Dem. Rep. Congo, Nepoko</td>
<td>-24.3</td>
<td>10.5</td>
<td>18.0</td>
<td>-34.9</td>
<td>7.4</td>
</tr>
<tr>
<td>22.33</td>
<td>-2.68</td>
<td>Dem. Rep. Congo, Momu</td>
<td>-23.7</td>
<td>10.8</td>
<td>16.0</td>
<td>-44.8</td>
<td>7.1</td>
</tr>
<tr>
<td>23.55</td>
<td>-1.35</td>
<td>Dem. Rep. Congo, Moma</td>
<td>-24.9</td>
<td>11.1</td>
<td>16.3</td>
<td>-48.5</td>
<td>5.6</td>
</tr>
<tr>
<td>29.50</td>
<td>0.45</td>
<td>Dem. Rep. Congo, Beni</td>
<td>-23.5</td>
<td>10.9</td>
<td>15.9</td>
<td>-43.2</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Country of prediction: CD
Testing robustness of assignment: Wilcoxon signed rank test

If p-value > 0.05, the test concludes that the isotope signature of the test sample is similar to the respective nearest neighbour reference sample.

P-values for the k nearest neighbours in Wilcoxon Test

“0.05677265, 0.02915903, 0.00160003, 0.00011122, 0.00006815, 0.00003100, 0.00001761, 0.00001310, 0.00000962, 0.00000358, 0.00000077, 0.00000049, 0.00000018”

Goodness of fit of test sample:

- good fit: if p > 0.05 for at least two tested nearest neighbour reference samples;
- moderate fit: if p > 0.05 for at least one tested nearest neighbour reference samples;
- uncertain: if p > 0.05 for none of the tested nearest neighbour reference samples.

Assumption: At least two nearest reference samples are available.

Overall goodness of fit of test sample: “moderate fit”