Spatial assignment of test sample

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Input

Website Identifier: 276

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>Value</td>
<td>-20.8</td>
<td>6.3</td>
<td>18.2</td>
<td>-36.3</td>
<td>11.3</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: 0.1889986
## Best kernel: triangular
## Best k: 14

Classifier: region
Map of best fitted reference sample

Best fitted reference sample:

- Site: South Africa, Ithala
- Country: ZA
- Region: Southern Africa
- CITES: Appendix II
- Lat: -27.51
- Lon: 31.29
**Assignment of test sample to nearest neighbours**

![Graph showing assignment of test sample to nearest neighbours]

**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>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-21.4</td>
<td>7.1</td>
<td>18.3</td>
<td>-39.9</td>
<td>11.8</td>
</tr>
<tr>
<td>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-21.2</td>
<td>7.0</td>
<td>17.7</td>
<td>-42.2</td>
<td>11.1</td>
</tr>
<tr>
<td>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-22.1</td>
<td>6.5</td>
<td>17.9</td>
<td>-37.8</td>
<td>10.7</td>
</tr>
<tr>
<td>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-21.4</td>
<td>7.2</td>
<td>17.0</td>
<td>-37.8</td>
<td>11.1</td>
</tr>
<tr>
<td>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-21.8</td>
<td>6.6</td>
<td>18.1</td>
<td>-42.4</td>
<td>10.0</td>
</tr>
<tr>
<td>32.38</td>
<td>-11.29</td>
<td>North Zambia, near Msitu</td>
<td>-20.7</td>
<td>7.0</td>
<td>18.2</td>
<td>-44.8</td>
<td>10.6</td>
</tr>
<tr>
<td>31.29</td>
<td>-27.51</td>
<td>South Africa, Ithala</td>
<td>-21.4</td>
<td>7.1</td>
<td>16.9</td>
<td>-41.0</td>
<td>10.8</td>
</tr>
</tbody>
</table>

**Region of prediction:** Southern Africa

**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**

"0.127859, 0.048173, 0.022221, 0.012467, 0.006618, 0.003303, 0.000037"
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"