Package 'phonics'

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Description Provides a collection of phonetic algorithms including Soundex, Metaphone, NYSIIS, Caverphone, and others. The package is documented in <doi:10.18637/jss.v095.i08>.

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Author James Howard [aut, cre] (ORCID:
<https://orcid.org/0000-0003-4530-1547>),
Kyle Haynes [ctb],
Amanda Hood [ctb],
Os Keyes [ctb]

Maintainer James Howard <jh@jameshoward.us>

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Contents

`caverphone` *Caverphone*

Description

The Caverphone family of phonetic algorithms

Usage

```
caverphone(word, maxCodeLen = NULL, modified = FALSE, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`modified`	if `TRUE`, use the Caverphone 2 algorithm
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The variable `maxCodeLen` is the limit on how long the returned Caverphone code should be. The default is 6, unless `modified` is set to `TRUE`, then the default is 10.

The variable `modified` directs `caverphone` to use the Caverphone2 method, instead of the original.

The `caverphone` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `caverphone`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `caverphone` attempts to process the strings. The default is `TRUE`.

Value

the Caverphone encoded character vector

References

David Hood, "Caverphone: Phonetic matching algorithm," Technical Paper CTP060902, University of Otago, New Zealand, 2002.

David Hood, "Caverphone Revisited," Technical Paper CTP150804 University of Otago, New Zealand, 2004.

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

See Also

Other phonics: `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`, `statcan()`

Examples

```
caverphone("William")
caverphone(c("Peter", "Peady"), modified = TRUE)
caverphone("Stevenson", maxCodeLen = 4)
```

`cologne` *Cologne Phonetic Name Coding*

Description

The Cologne phonetic name coding procedure.

Usage

```
cologne(word, maxCodeLen = NULL, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The variable `word` is the name to be encoded. The variable `maxCodeLen` is the limit on how long the returned name code should be. The default is 4.

The `cologne` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z," "Ä," "Ö," "Ü," and "ß." Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "ç," may be permissible in the current locale but are unknown to `cologne`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `cologne` attempts to process the strings. The default is `TRUE`.

Value

the Cologne encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Hans Joachim Postel. "Die Koelner Phonetik. Ein Verfahren zur Identifizierung von Personennamen auf der Grundlage der Gestaltanalyse." *IBM-Nachrichten* 19. Jahrgang, 1969, p. 925-931.

See Also

Other phonics: `caverphone()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`, `statcan()`

Examples

```
cologne("William")
cologne(c("Peter", "Peady"))
cologne("Stevenson", maxCodeLen = 8)
```

---

lein *Lein Name Coding*

Description

The Lein name coding procedure.

Usage

```
lein(word, maxCodeLen = 4, clean = TRUE)
```

Arguments

word	string or vector of strings to encode
maxCodeLen	maximum length of the resulting encodings, in characters
clean	if TRUE, return NA for unknown alphabetical characters

Details

The variable word is the name to be encoded. The variable maxCodeLen is the limit on how long the returned name code should be. The default is 4.

The lein algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to lein. For inputs outside of its known range, the output is undefined and NA is returned and a warning this thrown. If clean is FALSE, lein attempts to process the strings. The default is TRUE.

Value

the Lein encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Billy T. Lynch and William L. Arends. "Selection of surname coding procedure for the SRS record linkage system." United States Department of Agriculture, Sample Survey Research Branch, Research Division, Washington, 1977.

See Also

Other phonics: caverphone(), cologne(), metaphone(), mra_encode(), nysiis(), onca(), phonex(), phonics(), rogerroot(), soundex(), statcan()

Examples

```
lein("William")
lein(c("Peter", "Peady"))
lein("Stevenson", maxCodeLen = 8)
```

metaphone *Generate phonetic versions of strings with Metaphone*

Description

The function metaphone phonentically encodes the given string using the metaphone algorithm.

Usage

```
metaphone(word, maxCodeLen = 10L, clean = TRUE)
```

Arguments

word	string or vector of strings to encode
maxCodeLen	maximum length of the resulting encodings, in characters
clean	if TRUE, return NA for unknown alphabetical characters

Details

There is some discrepency with respect to how the metaphone algorithm actually works. For instance, there is a version in the Java Apache Commons library. There is a version provided within PHP. These do not provide the same results. On the questionable theory that the implementation in PHP is probably more well known, this code should match it in output.

This implementation is based on a Javascript implementation which is itself based on the PHP internal implementation.

The variable maxCodeLen is the limit on how long the returned metaphone should be.

The metaphone algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to metaphone. For inputs outside of its known range, the output is undefined and NA is returned and a warning this thrown. If clean is FALSE, metaphone attempts to process the strings. The default is TRUE.

Value

a character vector containing the metaphones of word, or an NA if the word value is NA

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

See Also

Other phonics: caverphone(), cologne(), lein(), mra_encode(), nysiis(), onca(), phonex(), phonics(), rogerroot(), soundex(), statcan()

Examples

```
metaphone("wheel")
metaphone(c("school", "benji"))
```

`mra_encode` *Match Rating Approach Encoder*

Description

The Western Airlines matching rating approach name encoder

Usage

```
mra_encode(word, clean = TRUE)

mra_compare(x, y)
```

Arguments

`word`	string or vector of strings to encode
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters
`x`	MRA-encoded character vector
`y`	MRA-encoded character vector

Details

The variable `word` is the name to be encoded. The variable `maxCodeLen` is *not* supported in this algorithm encoder because the algorithm itself is dependent upon its six-character length. The variables `x` and `y` are MRA-encoded and are compared to each other using the MRA comparison specification.

The `mra_encode` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `mra_encode`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `mra_encode` attempts to process the strings. The default is `TRUE`.

Value

The `mra_encode` function returns match rating approach encoded character vector. The `mra_compare` returns a boolean vector which is `TRUE` if `x` and `y` pass the MRA comparison test.

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

G.B. Moore, J.L. Kuhns, J.L. Treffzs, and C.A. Montgomery, *Accessing Individual Records from Personal Data Files Using Nonunique Identifiers,* US National Institute of Standards and Technology, SP-500-2 (1977), p. 17.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`, `statcan()`

Examples

```
mra_encode("William")
mra_encode(c("Peter", "Peady"))
mra_encode("Stevenson")
```

`nysiis` *New York State Identification and Intelligence System*

Description

The NYSIIS phonetic algorithm

Usage

```
nysiis(word, maxCodeLen = 6, modified = FALSE, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`modified`	if `TRUE`, use the modified NYSIIS algorithm
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The `nysiis` function phentically encodes the given string using the New York State Identification and Intelligence System (NYSIIS) algorithm. The algorithm is based on the implementation provided by Wikipedia and is implemented in pure R using regular expressions.

The variable `maxCodeLen` is the limit on how long the returned NYSIIS code should be. The default is 6.

The variable `modified` directs `nysiis` to use the modified method instead of the original.

The `nysiis` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips

spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `nysiis`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `nysiis` attempts to process the strings. The default is `TRUE`.

Value

the NYSIIS encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Robert L. Taft, *Name search techniques*, Bureau of Systems Development, Albany, New York, 1970.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`, `statcan()`

Examples

```
nysiis("Robert")
nysiis("rupert")
nysiis(c("Alabama", "Alaska"), modified = TRUE)
nysiis("mississippi", 4)
```

---

onca *Oxford Name Compression Algorithm*

Description

The Oxford Name Compression Algorithm name coding procedure

Usage

```
onca(word, maxCodeLen = 4, clean = TRUE, modified = FALSE, refined = FALSE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters
`modified`	if `TRUE`, use the modified `nysiis` function
`refined`	if `TRUE`, use the `refinedSoundex` function

Details

The variable `word` is the name to be encoded. The variable `maxCodeLen` is the limit on how long the returned name code should be. The default is 4.

The `onca` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `onca`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `onca` attempts to process the strings. The default is `TRUE`.

Value

the ONCA encoded character vector

References

Gill, Leicester. "OX-LINK: the Oxford medical record linkage system." (1997).

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`, `statcan()`

Examples

```
onca("William")
onca(c("Peter", "Peady"))
onca("Stevenson", maxCodeLen = 8)
```

---

phonex *Phonex Name Coding*

Description

The Phonex name coding procedure.

Usage

```
phonex(word, maxCodeLen = 4, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The variable word is the name to be encoded. The variable maxCodeLen is the limit on how long the returned name code should be. The default is 4.

The phonex algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z," "Ä," "Ö," "Ü," and "ß." Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "ç," may be permissible in the current locale but are unknown to phonex. For inputs outside of its known range, the output is undefined and NA is returned and a warning this thrown. If clean is FALSE, phonex attempts to process the strings. The default is TRUE.

Value

the Phonex encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

A.J. Lait and Brian Randell. "An assessment of name matching algorithms." Technical Report Series-University of Newcastle Upon Tyne Computing Science (1996).

See Also

Other phonics: caverphone(), cologne(), lein(), metaphone(), mra_encode(), nysiis(), onca(), phonics(), rogerroot(), soundex(), statcan()

Examples

```
phonex("William")
phonex(c("Peter", "Peady"))
phonex("Stevenson", maxCodeLen = 8)
```

---

phonics *Phonetic Spelling Algorithms*

Description

The phonics package for R is designed to provide a variety of phonetic indexing algorithms in common and not-so-common use today. The algorithms generally reduce a string to a symbolic representation approximating the sound made by pronouncing the string. They can be used to match names, strings, and as a proxy for assorted string distance algorithms. The algorithm reduces a string to a symbolic representation approximating the sound. It can be used to match names, strings, and as a proxy for assorted string distance algorithms.

Usage

```
phonics(word, method, clean = TRUE)
```

Arguments

word	string or vector of strings to encode
method	vector of method names to use
clean	if TRUE, return NA for unknown alphabetical characters

Details

The phonics package for R is designed to provide a variety of phonetic indexing algorithms in common and not-so-common use today. The algorithms generally reduce a string to a symbolic representation approximating the sound made by pronouncing the string. They can be used to match names, strings, and as a proxy for assorted string distance algorithms. The algorithm reduces a string to a symbolic representation approximating the sound. It can be used to match names, strings, and as a proxy for assorted string distance algorithms.

The variable word is a character string or a vector of character strings to be encoded.

Different phonetic algorithm are only defined for inputs over the limited alphabets, Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. For inputs outside of its known range, the output is undefined and NA is returned and a warning this thrown. If clean is FALSE, phonics attempts to process the strings. The default is TRUE.

The method parameter should be a character vector containing one or more methods that should be used. The available list of methods is "caverphone", "caverphone.modified", "cologne", "lein", "metaphone", "nysiis", "nysiis.modified", "onca", "onca.modified", "onca.refined", "onca.modified.refined", "phonex", "rogerroot", "soundex", "soundex.refined", and "statcan".

Value

Returns a data frame containing the phonetic spellings of the input for each method applied.

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

See Also

Other phonics: caverphone(), cologne(), lein(), metaphone(), mra_encode(), nysiis(), onca(), phonex(), rogerroot(), soundex(), statcan()

Examples

```
phonics(c("Peter", "Peady"), c("soundex", "soundex.refined"))
```

`rogerroot` *Roger Root Name Coding Procedure*

Description

Provides the Roger Root name coding system

Usage

```
rogerroot(word, maxCodeLen = 5, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The `rogerroot` function phentically encodes the given string using the Roger Root algorithm. The variable `word` is a string or vector of strings to encode.

The variable `maxCodeLen` is the limit on how long the returned code should be. The default is 5.

The `rogerroot` algorithm is only defined for inputs over the standard English alphabet, *i.e.*, "A-Z.". Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `rogerroot`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `rogerroot` attempts to process the strings. The default is `TRUE`.

Value

the Roger Root encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Robert L. Taft, *Name search techniques*, Bureau of Systems Development, Albany, New York, 1970.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `soundex()`, `statcan()`

Examples

```
rogerroot("William")
rogerroot(c("Peter", "Peady"))
rogerroot("Stevenson")
```

---

soundex *Soundex*

Description

The Soundex phonetic algorithms

Usage

```
soundex(word, maxCodeLen = 4L, clean = TRUE)

refinedSoundex(word, maxCodeLen = 10L, clean = TRUE)
```

Arguments

word	string or vector of strings to encode
maxCodeLen	maximum length of the resulting encodings, in characters
clean	if TRUE, return NA for unknown alphabetical characters

Details

The function soundex phonentically encodes the given string using the soundex algorithm. The function refinedSoundex uses Apache's refined soundex algorithm. Both implementations are loosely based on the Apache Commons Java editons.

The variable maxCodeLen is the limit on how long the returned soundex should be.

The soundex and revisedSoundex algorithms are only defined for inputs over the standard English alphabet, *i.e.*, "A-Z." Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to soundex and revisedSoundex. For inputs outside of its known range, the output is undefined and NA is returned and a warning this thrown. If clean is FALSE, soundex and revisedSoundex attempts to process the strings. The default is TRUE.

Value

soundex encoded character vector

Caveats

The soundex and refinedSoundex algorithms are only defined for inputs over the standard English alphabet, *i.e.*, "A-Z." For inputs outside this range, the output is undefined.

References

Charles P. Bourne and Donald F. Ford, "A study of methods for systematically abbreviating English words and names," *Journal of the ACM*, vol. 8, no. 4 (1961), p. 538-552.

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Howard B. Newcombe, James M. Kennedy, "Record linkage: making maximum use of the discriminating power of identifying information," *Communications of the ACM*, vol. 5, no. 11 (1962), p. 563-566.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `statcan()`

Examples

```
soundex("wheel")
soundex(c("school", "benji"))
```

`statcan` *Statistics Canada Name Coding*

Description

The modified Statistics Canada name coding procedure

Usage

```
statcan(word, maxCodeLen = 4, clean = TRUE)
```

Arguments

`word`	string or vector of strings to encode
`maxCodeLen`	maximum length of the resulting encodings, in characters
`clean`	if `TRUE`, return `NA` for unknown alphabetical characters

Details

The variable `word` is the name to be encoded. The variable `maxCodeLen` is the limit on how long the returned name code should be. The default is 4.

The `statcan` algorithm is only defined for inputs over the standard French alphabet. Non-alphabetical characters are removed from the string in a locale-dependent fashion. This strips spaces, hyphens, and numbers. Other letters, such as "Ü," may be permissible in the current locale but are unknown to `statcan`. For inputs outside of its known range, the output is undefined and `NA` is returned and a `warning` this thrown. If `clean` is `FALSE`, `statcan` attempts to process the strings. The default is `TRUE`.

Value

the Statistics Canada encoded character vector

References

James P. Howard, II, "Phonetic Spelling Algorithm Implementations for R," *Journal of Statistical Software*, vol. 25, no. 8, (2020), p. 1–21, <10.18637/jss.v095.i08>.

Billy T. Lynch and William L. Arends. "Selection of surname coding procedure for the SRS record linkage system." United States Department of Agriculture, Sample Survey Research Branch, Research Division, Washington, 1977.

See Also

Other phonics: `caverphone()`, `cologne()`, `lein()`, `metaphone()`, `mra_encode()`, `nysiis()`, `onca()`, `phonex()`, `phonics()`, `rogerroot()`, `soundex()`

Examples

```
statcan("William")
statcan(c("Peter", "Peady"))
statcan("Stevenson", maxCodeLen = 8)
```

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