

# Package ‘PersianStemmer’

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**Type** Package

**Title** Persian Stemmer for Text Analysis

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**Description** Allows users to stem Persian texts for text analysis.

**License** GPL (>= 2)

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PersianStemmer-package

*A package for stemming Persian for text analysis.*

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### Description

This package is a Persian Stemmer for Text Analysis.

### Details

Use the PerStem function.

### Author(s)

Roozbeh Safshekan <rse@mit.edu> and Rich Nielsen <rnielsen@mit.edu>

### See Also

[PerStem](#)

### Examples

```
# Load data
data(UniversityofTehran)

# Stem and transliterate the text
PerStem(UniversityofTehran,NoEnglish=TRUE, NoNumbers= TRUE,
        NoStopwords=TRUE, NoPunctuation= TRUE,
        StemVerbs = TRUE, NoPreSuffix= TRUE, Context = TRUE,
        StemBrokenPlurals=TRUE,Transliteration= TRUE)
```

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FixBrokenPlurals

*Stems Arabic broken plurals*

---

### Description

Stems Arabic broken plurals and returns singulars.

### Usage

```
FixBrokenPlurals(texts)
```

### Arguments

texts            A string with Arabic broken plurals that should be stemmed.

**Value**

FixBrokenPlurals returns a string with Arabic broken plurals stemmed.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Arabic broken plurals
x <- '\u0645\u0635\u0627\u062F\u06CC\u0642
\u0648\u0632\u0631\u0627
\u062D\u062F\u0648\u062F'

# Remove new line characters and fixe half-spaces from a string.
x <- RemNewlineHalfspace(x)

# Remove all characters that are not Latin, Persian or punctuation,
# and standardize Persian characters.
x <- RefineChars(x)

# Stem Arabic broken plurals
FixBrokenPlurals(x)
```

---

FixVerbs

*Stemms verbs*

---

**Description**

Stems verbs and returns past and present roots.

**Usage**

```
FixVerbs(texts, Context)
```

**Arguments**

texts	A Persian string in unicode.
Context	If TRUE, the function stems past-root+'he' only if other verbs with the same past-root exist in text. If FALSE, the function stems verbs without considering other words in text.

**Value**

FixVerbs returns a string with verbs stemmed.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Persian verbs
x <- '\u0646\u0648\u0634\u062A\u0647 \u0634\u062F\u0647
\u0628\u0648\u062F\u0647 \u0627\u0633\u062A - \u0646\u0648\u0634\u062A\u0645 -
\u062F\u0627\u0631\u06CC\u0645 \u0645\u06CC\u0631\u0648\u06CC\u0645 -
\u062E\u0648\u0627\u0646\u062F\u0647 \u0645\u06CC\u0634\u0648\u0646\u062F -
\u062E\u0648\u0627\u0647\u062F \u06AF\u0641\u062A -
\u0628\u0631\u062F\u0647 \u0627\u0633\u062A -
\u0645\u06CC\u06AF\u0648\u06CC\u06CC\u0645'
```

```
# Remove new line characters and fixe half-spaces from a string.
x <- RemNewlineHalfspace(x)
```

```
# Remove all characters that are not Latin, Persian or punctuation,
# and standardize Persian characters.
x <- RefineChars(x)
```

```
# Stems verbs
y <- FixVerbs(x, Context = TRUE)
z <- FixVerbs(x, Context = FALSE)
```

```
# Remove the numeric signifiers which are used in PerStem function.
gsub("0|1|2|3|4|5", "", y)
gsub("0|1|2|3|4|5", "", z)
```

PerStem

*Persian Stemmer for Text Analysis***Description**

Stems Persian texts for text analysis.

**Usage**

```
PerStem(dat, NoEnglish = TRUE, NoNumbers = TRUE,
NoStopwords = TRUE, NoPunctuation = TRUE,
StemVerbs = TRUE, NoPreSuffix = TRUE,
Context = TRUE, StemBrokenPlurals = TRUE,
Transliteration = TRUE)
```

**Arguments**

dat	The original data.
NoEnglish	Removes English characters.
NoNumbers	Removes numbers.
NoStopwords	Removes stopwords by using the default stopword list.
NoPunctuation	If TRUE the function removes punctuation. If FALSE, it fixes punctuation for text analysis.

StemVerbs	Performs stemming on verbs and returns past or present root of the verb.
NoPreSuffix	Performs stemming by removing prefixes and suffixes.
Context	If TRUE, the function performs stemming on a word only if its stem exists in text. If FALSE, the function performs stemming without considering other words in text.
StemBrokenPlurals	Performs stemming on Arabic broken plurals and return singulars by using the default Arabic broken plurals list.
Transliteration	Transliterates Persian unicode characters into Latin characters using a transliteration system developed by Roozbeh Safshekan and Rich Nielsen.

### Details

PerStem prepares texts in Persian for text analysis by stemming.

### Value

PerStem returns the stemmed Persian text.

### Author(s)

Roozbeh Safshekan, Richard Nielsen

### Examples

```
# Load data
data(UniversityofTehran)

# Stem and transliterate the text
PerStem(UniversityofTehran,NoEnglish=TRUE, NoNumbers= TRUE,
        NoStopwords=TRUE, NoPunctuation= TRUE,
        StemVerbs = TRUE, NoPreSuffix= TRUE, Context = TRUE,
        StemBrokenPlurals=TRUE,Transliteration= TRUE)
```

---

RefineChars	<i>Removes all characters that are not Latin, Persian or punctuation, and standardizes Persian characters.</i>
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### Description

Removes all unicode characters except Latin, Persian or General Punctuation characters and standardizes Persian characters.

### Usage

```
RefineChars(texts)
```

**Arguments**

`texts` A string from which all characters that are not Latin, Persian or punctuation should be removed, or in which Persian characters should be standardized.

**Value**

RefineChars returns a string with only Latin, standardized Persian or general punctuation characters.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Latin, Persian, Japanese, non-standardized Persian and punctuation characters.
x <- '\u062F\u0627\u0646\u0634\u06AF\u0627\u064A \u060C
\u0641\u06CC\u0632\u06CC\u0643 university
\u65E5\u672C \u0664\u0665\u0666'

# Remove new line characters and fixe half-spaces from a string.
x <- RemNewlineHalfspace(x)

# Remove all characters that are not Latin, Persian or punctuation,
# and standardize Persian characters.
RefineChars(x)
```

---

RemNewlineHalfspace *Removes new line characters and fixes half-spaces*

---

**Description**

Removes new line characters and fixes half-spaces in a string.

**Usage**

```
RemNewlineHalfspace(texts)
```

**Arguments**

`texts` A string which its new line characters and half-spaces should be removed or fixed.

**Value**

RemNewlineHalfspace returns a string with new line characters and half-spaces removed or fixed.



RemoveNumbers      *Remove numerals.*

---

**Description**

Removes numerals from a string.

**Usage**

```
RemoveNumbers(texts)
```

**Arguments**

texts              A string from which numerals should be removed.

**Value**

RemoveNumbers returns a string with numerals removed.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Persian characters and number
x <- '\u0633\u0627\u0644 \u06F1\u06F3\u06F9\u06F8'

# Remove Numbers
RemoveNumbers(x)
```

---

RemovePreSuffix      *Remove Persian prefixes and suffixes.*

---

**Description**

Removes Persian prefixes and suffixes from a unicode string using the default list of Persian prefixes and suffixes.

**Usage**

```
RemovePreSuffix(texts, Context)
```

**Arguments**

texts	A Persian string in unicode
Context	If TRUE, the function removes prefixes and suffixes of a word only if its stem exists in text. If FALSE, the function removes prefixes and suffixes without considering other words in text.

**Value**

RemovePreSuffix returns a string with Persian prefixes and suffixes removed.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Persian characters
x <- '\u0627\u0628\u0631\u0642\u062F\u0631\u062A\u0647\u0627\u06CC\u06CC
\u06A9\u062A\u0627\u0628\u0647\u0627\u06CC\u0645 \u06A9\u062A\u0627\u0628'

# Remove new line characters and fixe half-spaces from a string.
x <- RemNewlineHalfspace(x)

# Remove all characters that are not Latin, Persian or punctuation,
# and standardize Persian characters.
x <- RefineChars(x)

# Remove Prefixes and Suffixes
RemovePreSuffix(x, Context = TRUE)
RemovePreSuffix(x, Context = FALSE)
```

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RemoveStopwords	<i>Remove Persian stop-words.</i>
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**Description**

Defines a list of Persian stopwords and removes them from a string.

**Usage**

```
RemoveStopwords(texts)
```

**Arguments**

texts	A string from which Persian stopwords should be removed.
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**Value**

RemoveStopwords returns a string with Persian stopwords removed.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create Persian string with stopwords
x <- '\u0627\u0632
\u062F\u0627\u0646\u0634\u06AF\u0627\u0647
\u0622\u0645\u062F'

# Remove new line characters and fixe half-spaces from a string.
x <- RemNewlineHalfspace(x)

# Remove all characters that are not Latin, Persian or punctuation,
# and standardize Persian characters.
x <- RefineChars(x)

# Remove stopwords
RemoveStopwords(x)
```

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ReverseTransliterate *Transliterate Latin characters into Persian unicode characters*

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**Description**

Transliterates Latin characters into Persian unicode characters using a transliteration system developed by Roozbeh Safshekan and Rich Nielsen.

**Usage**

```
ReverseTransliterate(texts)
```

**Arguments**

texts            A string in Latin characters to be transliterated into Persian characters.

**Value**

ReverseTransliterate returns a string in Persian characters.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create Latin string
x <- 'danWGah thran'

# Converts Latin characters into Persian unicode characters
ReverseTransliterate(x)
```

---

RFPunctuation	<i>Remove or fix punctuation.</i>
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**Description**

Removes punctuation characters or inserts spaces before and after them so that they can be used in text analysis as separate units.

**Usage**

```
RFPunctuation(texts, NoPunctuation)
```

**Arguments**

texts	A string with punctuation which should be removed or fixed.
NoPunctuation	If TRUE, the function removes punctuation. If FALSE, the function inserts spaces before and after punctuation.

**Value**

RFPunctuation returns a string with punctuation removed or fixed for text analysis.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create string with Persian characters and punctuation
x <- '\u062F\u0627\u0646\u0634\u0627\u0647\u060C \u0627\u0647\u0631\u0627\u0646\u061F'

# Remove punctuation
RFPunctuation(x, NoPunctuation = TRUE)

# Fix punctuation
RFPunctuation(x, NoPunctuation = FALSE)
```

---

Transliterate	<i>Transliterate Persian unicode characters into Latin characters</i>
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**Description**

Transliterates Persian unicode characters into Latin characters using a transliteration system developed by Roozbeh Safshekan Rich Nielsen.

**Usage**

```
Transliterate(texts)
```

**Arguments**

texts            A string in Persian characters to be transliterated into Latin characters.

**Value**

Transliterate returns a string in Latin characters.

**Author(s)**

Safshekan, Nielsen

**Examples**

```
# Create Persian string
x <- '\u062F\u0627\u0646\u0634\u0627\u0627 \u0627\u0647 \u0627\u0631\u0627\u0646'

# Performs transliteration of Persian into Latin characters
Transliterate(x)
```

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UniversityofTehran	<i>Persian texts</i>
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**Description**

Persian text from the University of Tehran website

**Usage**

```
data("UniversityofTehran")
```

**Format**

Persian text data

**Source**

<https://ut.ac.ir/fa/page/200>

**Examples**

```
# Load data
data(UniversityofTehran)
```

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