Package ‘glue’

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Python's Literal String Interpolation <https://www.python.org/dev/peps/pep-0498/> and Docstrings
<https://www.python.org/dev/peps/pep-0257/> and Julia's Triple-Quoted String Literals
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as_glue  

**Coerce object to glue**

**Description**

Coerce object to glue

**Usage**

```r
as_glue(x, ...)
```

**Arguments**

- `x`  
  object to be coerced.
- `...`  
  further arguments passed to methods.

---

glue  

**Format and interpolate a string**

**Description**

Expressions enclosed by braces will be evaluated as R code. Long strings are broken by line and concatenated together. Leading whitespace and blank lines from the first and last lines are automatically trimmed.
Usage

```r
glue_data(
  .x,
  ..., 
  .sep = "", 
  .envir = parent.frame(),
  .open = "{", 
  .close = "}", 
  .na = "NA",
  .transformer = identity_transformer, 
  .trim = TRUE
)
```

```r
glue(
  ..., 
  .sep = "", 
  .envir = parent.frame(),
  .open = "{", 
  .close = "}", 
  .na = "NA",
  .transformer = identity_transformer, 
  .trim = TRUE
)
```

Arguments

- `.x` [listish]
  An environment, list or data frame used to lookup values.

- `...` [expressions]
  Unnamed arguments are taken to be expressions string(s) to format. Multiple inputs are concatenated together before formatting. Named arguments are taken to be temporary variables available for substitution.

- `.sep` [character(1): ""]
  Separator used to separate elements.

- `.envir` [environment: parent.frame()]
  Environment to evaluate each expression in. Expressions are evaluated from left to right. If `.x` is an environment, the expressions are evaluated in that environment and `.envir` is ignored. If `NULL` is passed it is equivalent to `emptyenv()`.

- `.open` [character(1): '{']
  The opening delimiter. Doubling the full delimiter escapes it.

- `.close` [character(1): '}']
  The closing delimiter. Doubling the full delimiter escapes it.

- `.na` [character(1): 'NA']
  Value to replace NA values with. If `NULL` missing values are propagated, that is an NA result will cause NA output. Otherwise the value is replaced by the value of `.na`. 
A function taking three parameters `code`, `envir` and `data` used to transform the output of each block before during or after evaluation. For example transformers see vignette("transformers").

Whether to trim the input template with `trim()` or not.

See Also

https://www.python.org/dev/peps/pep-0498/ and https://www.python.org/dev/peps/pep-0257 upon which this is based.

Examples

```r
name <- "Fred"
age <- 50
anniversary <- as.Date("1991-10-12")
glue("My name is {name}, 
my age next year is {age + 1},
my anniversary is {format(anniversary, "%A, %B %d, %Y")}.")

# single braces can be inserted by doubling them
glue("My name is {name}, not {{name}}.")

# Named arguments can be used to assign temporary variables.
glue("My name is {name}, 
my age next year is {age + 1},
my anniversary is {format(anniversary, "%A, %B %d, %Y")}.", name = "Joe",
age = 40,
anniversary = as.Date("2001-10-12"))

# `glue()` can also be used in user defined functions
intro <- function(name, profession, country){
  glue("My name is {name}, a {profession}, from {country}")
}
intro("Shelmith", "Senior Data Analyst", "Kenya")
intro("Cate", "Data Scientist", "Kenya")

# `glue_data()` is useful in magrittr pipes
library(magrittr)
mtcars %>% glue_data("{rownames(.)} has {hp} hp")

# Or within dplyr pipelines
library(dplyr)
head(iris) %>%
  mutate(description = glue("This {Species} has a petal length of {Petal.Length}"))

# Alternative delimiters can also be used if needed
one <- "1"
glue("The value of $e^{2\pi i}$ is $<<one>>$.", .open = "<<", .close = ">>")
```
**glue_col**

*Construct strings with color*

**Description**

The `crayon` package defines a number of functions used to color terminal output. `glue_col()` and `glue_data_col()` functions provide additional syntax to make using these functions in glue strings easier.

Using the following syntax will apply the function `crayon::blue()` to the text 'foo bar'.

```
{blue foo bar}
```

If you want an expression to be evaluated, simply place that in a normal brace expression (these can be nested).

```
{blue 1 + 1 = {1 + 1}}
```

**Usage**

```
glue_col(..., .envir = parent.frame(), .na = "NA")
```

```
glue_data_col(.x, ..., .envir = parent.frame(), .na = "NA")
```

**Arguments**

...  
[expressions]  
Unnamed arguments are taken to be expressions string(s) to format. Multiple inputs are concatenated together before formatting. Named arguments are taken to be temporary variables available for substitution.

.envir  
[environment: parent.frame()]  
Environment to evaluate each expression in. Expressions are evaluated from left to right. If .x is an environment, the expressions are evaluated in that environment and .envir is ignored. If NULL is passed it is equivalent to `emptyenv()`.

.na  
[character(1): ‘NA’]  
Value to replace NA values with. If NULL missing values are propagated, that is an NA result will cause NA output. Otherwise the value is replaced by the value of .na.

.x  
[listish]  
An environment, list or data frame used to lookup values.

**Examples**

```
if (require(crayon)) {
  glue_col("{blue foo bar}"

glue_col("{blue 1 + 1 = {1 + 1}}")
```
white_on_grey <- bgBlack $ white
glue_col("{white_on_grey
Roses are {red {colors()[[552]]}}
Violets are {blue {colors()[[26]]}}
'glue_col()' can show {red c}{yellow o}{green l}{cyan o}{blue r}{magenta s}
and {bold bold} and {underline underline} too!
})")

---

### glueCollapse

**Collapse a character vector**

**Description**

Collapses a character vector of any length into a length 1 vector.

**Usage**

```r
glueCollapse(x, sep = "", width = Inf, last = "")
```

**Arguments**

- **x**
  - The character vector to collapse.
- **sep**
  - a character string to separate the terms. Not `NA_character_`
- **width**
  - The maximum string width before truncating with `...`
- **last**
  - String used to separate the last two items if `x` has at least 2 items.

**Examples**

```r
glueCollapse(glue("1:10"))
```

# Wide values can be truncated
```r
glueCollapse(glue("1:10"), width = 5)
```

```r
glueCollapse(1:4, ", ", last = " and ")
```

#> 1, 2, 3 and 4
**glue_safe**

*Safely interpolate strings*

**Description**

`glue_safe()` and `glue_data_safe()` differ from `glue()` and `glue_data()` in that the safe versions only look up symbols from an environment use `get()` they do not execute any R code. This makes them suitable when used with untrusted input, such as inputs in a shiny application, where using the normal functions would allow an attacker to execute arbitrary code.

**Usage**

```r
glue_safe(..., .envir = parent.frame())

glue_data_safe(.x, ..., .envir = parent.frame())
```

**Arguments**

- `...` [expressions]
  Unnamed arguments are taken to be expressions string(s) to format. Multiple inputs are concatenated together before formatting. Named arguments are taken to be temporary variables available for substitution.

- `.envir` [environment: parent.frame()]
  Environment to evaluate each expression in. Expressions are evaluated from left to right. If `.x` is an environment, the expressions are evaluated in that environment and `.envir` is ignored. If NULL is passed it is equivalent to `emptyenv()`.

- `.x` [listish]
  An environment, list or data frame used to lookup values.

---

**glue_sql**

*Interpolate strings with SQL escaping*

**Description**

SQL databases often have custom quotation syntax for identifiers and strings which make writing SQL queries error prone and cumbersome to do. `glue_sql()` and `glue_data_sql()` are analogs to `glue()` and `glue_data()` which handle the SQL quoting.

**Usage**

```r
glue_sql(..., .con, .envir = parent.frame(), .na = DBI::SQL("NULL"))

glue_data_sql(.x, ..., .con, .envir = parent.frame(), .na = DBI::SQL("NULL"))
```
Arguments

- **[expressions]**: Unnamed arguments are taken to be expressions string(s) to format. Multiple inputs are concatenated together before formatting. Named arguments are taken to be temporary variables available for substitution.

- **.con [DBIConnection]**: A DBI connection object obtained from DBI::dbConnect().

- **.envir [environment::parent.frame()]**: Environment to evaluate each expression in. Expressions are evaluated from left to right. If .x is an environment, the expressions are evaluated in that environment and .envir is ignored. If NULL is passed it is equivalent to emptyenv().

- **.na [character(1): 'NA']**: Value to replace NA values with. If NULL missing values are propagated, that is an NA result will cause NA output. Otherwise the value is replaced by the value of .na.

- **.x [listish]**: An environment, list or data frame used to lookup values.

Details

They automatically quote character results, quote identifiers if the glue expression is surrounded by backticks `'` and do not quote non-characters such as numbers. If numeric data is stored in a character column (which should be quoted) pass the data to glue_sql() as a character.

Returning the result with DBI::SQL() will suppress quoting if desired for a given value.

Note parameterized queries are generally the safest and most efficient way to pass user defined values in a query, however not every database driver supports them.

If you place a * at the end of a glue expression the values will be collapsed with commas. This is useful for the SQL IN Operator for instance.

Value

A DBI::SQL() object with the given query.

Examples

```r
con <- DBI::dbConnect(RSQLite::SQLite(), "memory:")
iris2 <- iris
colnames(iris2) <- gsub("[.]", ",", tolower(colnames(iris)))
DBI::dbWriteTable(con, "iris", iris2)
var <- "sepal_width"
tbl <- "iris"
num <- 2
val <- "setosa"
glue_sql("SELECT `{var}`
  FROM `{tbl}`
  WHERE `{tbl}.sepal_length > {num}
      AND `{tbl}.species = {val}
  ", .con = con)
```
# If sepal_length is store on the database as a character explicitly convert
# the data to character to quote appropriately.

```r
glue_sql("$
SELECT '{var}'
FROM '{tbl}'
WHERE '{tbl}.sepal_length > {as.character(num)}
AND '{tbl}.species = {val}'
", .con = con)
```

# `glue_sql()` can be used in conjuction with parameterized queries using
# `DBI::dbBind()` to provide protection for SQL Injection attacks

```r
sql <- glue_sql("$
SELECT '{var}'
FROM '{tbl}'
WHERE '{tbl}.sepal_length > ?
", .con = con)
query <- DBI::dbSendQuery(con, sql)
DBI::dbBind(query, list(num))
DBI::dbFetch(query, n = 4)
DBI::dbClearResult(query)
```

# `glue_sql()` can be used to build up more complex queries with
# interchangeable sub queries. It returns `DBI::SQL()` objects which are
# properly protected from quoting.

```r
sub_query <- glue_sql("$
SELECT *
FROM '{tbl}'
", .con = con)
```

```r
glue_sql("$
SELECT s.{var}
FROM ("sub_query") AS s
", .con = con)
```

# If you want to input multiple values for use in SQL IN statements put `*`
# at the end of the value and the values will be collapsed and quoted appropriately.

```r
glue_sql("SELECT * FROM '{tbl}' WHERE sepal_length IN ({vals*})",
vals = 1:5, .con = con)
```

```r
glue_sql("SELECT * FROM '{tbl}' WHERE species IN ({vals*})",
vals = c("setosa", "versicolor"), .con = con)
```

# If you need to reference a variables from multiple tables use `DBI::Id()`.
# Here we create a new table of nicknames, join the two tables together and
# select columns from both tables. Using `DBI::Id()` and the special
iris_db <- "iris"
nicknames_db <- "nicknames"

nicknames <- data.frame(
  species = c("setosa", "versicolor", "virginica"),
  nickname = c("Beachhead Iris", "Harlequin Blueflag", "Virginia Iris"),
  stringsAsFactors = FALSE
)
DBI::dbWriteTable(con, nicknames_db, nicknames)

cols <- list(
  DBI::Id(table = iris_db, column = "sepal_length"),
  DBI::Id(table = iris_db, column = "sepal_width"),
  DBI::Id(table = nicknames_db, column = "nickname")
)

iris_species <- DBI::Id(table = iris_db, column = "species")
nicknames_species <- DBI::Id(table = nicknames_db, column = "species")

query <- glue_sql("SELECT {cols}* FROM {iris_db} JOIN {nicknames_db} ON {iris_species}={nicknames_species}, .con = con");
query

DBI::dbGetQuery(con, query, n = 5)
DBI::dbDisconnect(con)

identity_transformer  Parse and Evaluate R code

Description
This is a simple wrapper around eval(parse()), used as the default transformer.

Usage
identity_transformer(text, envir)

Arguments
text  Text (typically) R code to parse and evaluate.
envir  environment to evaluate the code in
See Also

vignette("transformers","glue") for documentation on creating custom glue transformers and some common use cases.

---

### Quoting operators

**Description**

These functions make it easy to quote each individual element and are useful in conjunction with glue_collapse().

**Usage**

```r
single_quote(x)

double_quote(x)

backtick(x)
```

**Arguments**

- `x`: A character to quote.

**Examples**

```r
x <- 1:5
glue('Values of x: {glue_collapse(backtick(x), sep = "", last = " and ")}')
```

---

### Trim a character vector

**Description**

This trims a character vector according to the trimming rules used by glue. These follow similar rules to Python Docstrings, with the following features.

- Leading and trailing whitespace from the first and last lines is removed.
- A uniform amount of indentation is stripped from the second line on, equal to the minimum indentation of all non-blank lines after the first.
- Lines can be continued across newlines by using \\

**Usage**

```r
trim(x)
```
Arguments

x  A character vector to trim.

Examples

```r
glue("  
A formatted string  
Can have multiple lines  
  with additional indentation preserved  
")

```
```
  \ntrailing or leading newlines can be added explicitly\n  
")

```
```
  A formatted string  
  can also be on a  
  single line  
")
```
```
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