# Package: lsReg (via r-universe)

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**Type** Package

**Title** Performs Large Scale Regressions

**Version** 1.0.0

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**Maintainer** John Morrison <jmorr@usc.edu>

**Description** Routines to perform large scale regression. Linear, logistic, and Poisson regressions are supported. Large scale regression efficiently fits models where a small number of covariates are changing and the subjects have complete data. A genome wide association study would be an example.

**Depends** R (>= 3.5.0)

**License** GPL-3

**Encoding** UTF-8

**Suggests** testthat (>= 3.0.0), knitr, rmarkdown, statmod

**VignetteBuilder** knitr

**RoxygenNote** 7.3.3

**LinkingTo** Rcpp, RcppArmadillo

**Imports** Rcpp, methods

**Config/testthat/edition** 3

**NeedsCompilation** yes

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**Repository** https://cran.r-universe.dev

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**RemoteUrl** https://github.com/cran/lsReg

**RemoteRef** HEAD

**RemoteSha** f15a96ec39f3cbb324bab581a75ec1409246cd9c

# Contents



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addcovar *Run a large-scale regression test*

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## Description

Computes a hypothesis test statistic for one or more new covariates `xr` using memory pre-allocated by `lsReg`.

## Usage

```
addcovar(lsregmem, xr)
```

## Arguments

| | |
|---|---|
| `lsregmem` | An object of class `lsregmem` as returned by `lsReg`. |
| `xr` | Numeric matrix of additional covariates to test. Number of columns must match the `colstoadd` value used in `lsReg`. |

## Value

Invisibly returns the exit code (0 on success, nonzero on error). After a successful call, results are stored in the `lsregmem` object:

`lsregmem$testvalue` The test statistic. For `"lrt"` this is a chi-square statistic (p-values via `pchisq`). For all other test types this is a z-score (p-values via `pnorm`).

`lsregmem$fitdata$betab` The parameter estimate(s) for `xr`. Not meaningful for `"score"` or `"robustscore"`, which do not fit the full model.

## Examples

```
datafile <- system.file("extdata", "simulated_data.rds", package = "lsReg")
dat <- readRDS(datafile)
basemdl <- glm(ylin ~ x1 + x2, data = dat, family = gaussian)
mem <- lsReg(basemdl, colstoadd = 1, testtype = "wald")
addcovar(mem, as.matrix(dat[, "z5", drop = FALSE]))
mem$fitdata$betab[1]  # parameter estimate for z5
mem$testvalue[1, 1]   # Wald z-score for z5
```

lsReg *Allocate memory for large-scale regression*

## Description

Prepares and caches data structures from a fitted base GLM for use in repeated large-scale hypothesis tests via addcovar.

## Usage

```
lsReg(basemdl, colstoadd, testtype)
```

## Arguments

| | |
|---|---|
| basemdl | Base model of the form y ~ xl, fitted with glm. Must be of family gaussian, binomial, or poisson. |
| colstoadd | Number of columns in xr. The full model tested will be y ~ xl + xr. |
| testtype | Character string specifying the test type. One of "lrt" (default), "score", "robustscore", "wald", or "robustwald". |

## Value

An object of class lsregmem containing pre-allocated matrices and cached quantities from the base model, for use with addcovar.

## Examples

```
datafile <- system.file("extdata", "simulated_data.rds", package = "lsReg")
dat <- readRDS(datafile)
basemdl <- glm(ylin ~ x1 + x2, data = dat, family = gaussian)
mem <- lsReg(basemdl, colstoadd = 1, testtype = "wald")
```

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