

## 0.1 `model.matrix.multiple`: Design matrix for multivariate models

### Description

Use `model.matrix.multiple` after `parse.formula` to create a design matrix for multiple-equation models.

### Usage

```
model.matrix.multiple(object, data, shape = "compact", eqn = NULL, ...)
```

### Arguments

<code>object</code>	the list of formulas output from <code>parse.formula</code>
<code>data</code>	a data frame created with <code>model.frame.multiple</code>
<code>shape</code>	a character string specifying the shape of the outputted matrix. Available options are <ul style="list-style-type: none"><li>"compact" (default) the output matrix will be an <math>n \times v</math>, where <math>v</math> is the number of unique variables in all of the equations (including the intercept term)</li><li>"array" the output is an <math>n \times K \times J</math> array where <math>J</math> is the total number of equations and <math>K</math> is the total number of parameters across all the equations. If a variable is not in a certain equation, it is observed as a vector of 0s.</li><li>"stacked" the output will be a <math>2n \times K</math> matrix where <math>K</math> is the total number of parameters across all the equations.</li></ul>
<code>eqn</code>	a character string or a vector of character strings identifying the equations from which to construct the design matrix. The defaults to <code>NULL</code> , which only uses the systematic parameters (for which <code>DepVar = TRUE</code> in the appropriate <code>describe.model</code> function)
<code>...</code>	additional arguments passed to <code>model.matrix.default</code>

### Value

A design matrix or array, depending on the options chosen in `shape`, with appropriate terms attributes.

### Author(s)

Kosuke Imai <<kimai@princeton.edu>>; Gary King <<king@harvard.edu>>; Olivia Lau <<olau@fas.harvard.edu>>; Ferdinand Alimadhi <<falimadhi@iq.harvard.edu>>

## See Also

`parse.par`, `parse.formula` and the full Zelig manual at <http://gking.harvard.edu/zelig>

## Examples

```
# Let's say that the name of the model is "bivariate.probit", and
# the corresponding describe function is describe.bivariate.probit(),
# which identifies mu1 and mu2 as systematic components, and an
# ancillary parameter rho, which may be parameterized, but is estimated
# as a scalar by default. Let par be the parameter vector (including
# parameters for rho), formulae a user-specified formula, and mydata
# the user specified data frame.

# Acceptable combinations of parse.par() and model.matrix() are as follows:
## Setting up
## Not run:
data(sanction)
formulae <- cbind(import, export) ~ coop + cost + target
fml <- parse.formula(formulae, model = "bivariate.probit")
D <- model.frame(fml, data = sanction)
terms <- attr(D, "terms")

## Intuitive option
Beta <- parse.par(par, terms, shape = "vector", eqn = c("mu1", "mu2"))
X <- model.matrix(fml, data = D, shape = "stacked", eqn = c("mu1", "mu2"))
eta <- X

## Memory-efficient (compact) option (default)
Beta <- parse.par(par, terms, eqn = c("mu1", "mu2"))
X <- model.matrix(fml, data = D, eqn = c("mu1", "mu2"))
eta <- X

## Computationally-efficient (array) option
Beta <- parse.par(par, terms, shape = "vector", eqn = c("mu1", "mu2"))
X <- model.matrix(fml, data = D, shape = "array", eqn = c("mu1", "mu2"))
eta <- apply(X, 3, '
## End(Not run)
```