

# Package ‘DoE.multi.response’

August 22, 2019

**Title** Construct Multi-Response Experimental Designs

**Version** 0.1.0

**Description** Construct multi-response experimental designs, such as a Unique Factor Central Composite Design (UF-CCD), given information (from screening or expert knowledge) about which factors are related to each response variable (Wilmina M. Marget & Max D. Morris, 2019 <doi:10.1080/00401706.2018.1549102>).

**Depends** R (>= 3.6), DoE.wrapper (>= 0.10)

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.1.1

**Suggests** testthat

**NeedsCompilation** no

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**Repository** CRAN

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ufactors *This function generates the unique factors for a unique factor CCD.*

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**Description**

This function generates the unique factors for a unique factor CCD.

**Usage**

```
ufactors(x)
```

**Arguments**

`x` a matrix of 0's and 1's indicating factor and response relationships. Rows represent responses; columns represent factors. A 1 represents that the factor for that column is related to the response for that row.

**Value**

numeric vector indicating unique factors

**Examples**

```
#Response 1 is related to factors 1, 2, and 3
#Response 2 is related to factors 2, 3, and 4
#Response 3 is related to factors 1, 3, and 5
#Response 4 is related to factors 1 and 4
x<-matrix(c(1,1,1,0,0,
            0,1,1,1,0,
            1,0,1,0,1,
            1,0,0,1,0), nrow = 4,byrow = TRUE)
ufactors(x)
```

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ufccd *This function generates the design matrix for a unique factor CCD.*

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**Description**

This function generates the design matrix for a unique factor CCD.

**Usage**

```
ufccd(x, ...)
```

**Arguments**

- `x` a matrix of 0's and 1's indicating factor and response relationships. Rows represent responses; columns represent factors. A 1 represents that the factor for that column is related to the response for that row.
- `...` passes other arguments through `ccd.design()` from the `DoE.wrapper` package. Does not currently support `factor.names`.

**Value**

a data.frame that is a unique factor Central Composite Design with values coded so that factorial points are 1 and -1

**Examples**

```
#Response 1 is related to factors 1, 2, and 3
#Response 2 is related to factors 2, 3, and 4
#Response 3 is related to factors 1, 3, and 5
#Response 4 is related to factors 1 and 4
x<-matrix(c(1,1,1,0,0,
            0,1,1,1,0,
            1,0,1,0,1,
            1,0,0,1,0), nrow = 4,byrow = TRUE)
ufccd(x)
```

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