

# Package ‘FMC’

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**Type** Package

**Title** Factorial Experiments with Minimum Level Changes

**Version** 1.0.0

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**Description** Generate cost effective minimally changed run sequences for symmetrical as well as asymmetrical factorial designs.

**Imports** utils, minimalRSD, stats

**License** GPL (>= 2)

**LazyData** TRUE

**RoxygenNote** 5.0.1

**NeedsCompilation** no

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FMC

*FMC: A package for constructing minimally changed run sequences in factorial experiments*

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## Description

The FMC package can be used to construct run sequences with minimum changes in factor levels. Experimenter can save time and resources by minimizing the number of changes in levels of individual factor and therefore the total number of changes. The package provides the function `minimal.factorial` and `gen.level`. This technique can be employed to any symmetric or asymmetric factorial combination.

## Details

In Design of Experiments (DOE) theory, levels of a factor can be represented as integers e.g. - 1 for low, 0 for medium and 1 for high. This representation helps in studying factors with high number of levels. The function "`gen.level()`" provides the same representation for any factor with given number of total levels. User is expected to enter a vector of total number of levels for each factor to be considered in the experiment. Function "`minimal.factorial()`" provides the required run sequences for the input vector of level totals. The output also gives the number of changes of each factor along with total number of changes in the run sequence.

## FMC functions

`gen.level`: Generate integers representing the levels of a factor.  
`minimal.factorial`: Generate minimally changed runs for asymmetric and symmetric factorial combinations..

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## References

Arpan Bhowmik, Eldho Varghese, Seema Jaggi and Cini Varghese(2016).Minimally changed run sequences in factorial experiments. Communications in Statistics - Theory and Methods, DOI: 10.1080/03610926.2016.1152490.  
Arpan Bhowmik, Eldho Varghese, Seema Jaggi and Cini Varghese (2015). Factorial Experiments with Minimum Changes in Run Sequences. Journal of the Indian Society of Agricultural Statistics. 69(3), 243-255.

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`gen.level`                      *Generate Levels*

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**Description**

Generate coded integers for given total number of levels of a factor.

**Usage**

```
gen.level(x)
```

**Arguments**

x                      An integer greater than or equal to 2.

**Value**

a vector of integers as coded levels for a factor with total number of levels as x.

**Examples**

```
# To generate 5 levels for a factor
gen.level(5)
```

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`minimal.factorial`                      *Minimally Changed Run Sequences*

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**Description**

Generate minimally changed run sequences for a given asymmetrical or symmetrical factorial design.

**Usage**

```
minimal.factorial(z)
```

**Arguments**

z                      A vector of size 2 with entries integers greater than 1.

**Value**

returns minimally changed run sequences for given factorial setting as v.

**Examples**

```
#' ## make a vector of factor levels
z <- c(2,3,4)
# To generate minimally changed run sequence
minimal.factorial(z)
```

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