

Package: matrixmodp (via r-universe)

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Title Working with Matrices over Finite Prime Fields

Version 0.2.0

Description Provides functions for row-reducing and inverting matrices with entries in many of the finite fields (those with a prime number of elements). With this package, users will be able to find the reduced row echelon form (RREF) of a matrix and calculate the inverse of a (square, invertible) matrix.

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Encoding UTF-8

RoxygenNote 7.3.1

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

URL <https://github.com/rhigginbottom/matrixmodp>,
<https://rhigginbottom.github.io/matrixmodp/>

BugReports <https://github.com/rhigginbottom/matrixmodp/issues>

NeedsCompilation no

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Repository CRAN

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Contents

inv_p	2
rref_p	2

Index	4
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inv_p	<i>Calculate the inverse of a matrix mod p</i>
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Description

inv_p() finds the inverse of a square matrix over the field F_p . The function checks for invertibility and then row-reduces the augmented matrix $[A|I]$ over F_p to find the inverse.

Usage

```
inv_p(A, p)
```

Arguments

A	A square matrix
p	A prime integer

Value

A square matrix of the same size as A

Examples

```
B <- matrix(c(5, 2, 3, 6, 5, 5, 4, 0, 2), 3, 3)
inv_p(B, 7)
C <- matrix(c(3, 0, 4, 0, 2, 1, 1, 3, 0, 3, 0, 1, 3, 0, 2, 1), 4, 4)
inv_p(C, 5)
```

rref_p	<i>Find the RREF of a matrix mod p</i>
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Description

rref_p() calculates the unique reduced-row echelon form of a matrix with entries in the finite field F_p .

Usage

```
rref_p(A, p)
```

Arguments

A	A matrix
p	A prime integer

Value

A matrix of the same size as A which is the unique reduced-row echelon form of A.

Examples

```
B <- matrix(c(3, 4, 1, 3, 2, 0), 2, 3)
rref_p(B, 5)
C <- matrix(c(0, 2, 0, 0, 0, 2, 0, 1, 1), 3, 3)
rref_p(C, 3)
```

Index

inv_p, [2](#)

rref_p, [2](#)