

fpz egg

Floating-point Comparison With Epsilon
Extension for Chicken Scheme
Version 0.1

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1 About this egg

1.1 Version history

0.1 Initial release

1.2 Usage

Load this egg like so:

```
(require-extension fpfz)
```

1.3 Requirements

This egg requires the following extensions:

```
miscmacros
```

2 Documentation

Routines to perform floating-point operations with an error bound. These routines are not some cure-all for floating-point anomalies, but useful anyway.

2.1 Parameters

`(current-fpz-epsilon [#])` [parameter]
Sets or returns the error bound.

2.2 Predicates

The formula below are for exposition only; they are not the actual test.

`fpfz=` [macro]
`(fpfz= A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| \leq E.$

`fpfz<>` [macro]
`(fpfz<> A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| > E.$

`fpfz>` [macro]
`(fpfz> A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| > E.$

`fpfz<` [macro]
`(fpfz< A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| < E.$

`fpfz>=` [macro]
`(fpfz>= A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| \geq E.$

`fpfz<=` [macro]
`(fpfz<= A B [EPSILON (current-fpz-epsilon)])`
 $|a - b| \leq E.$

2.3 Operations

`roundn` [macro]
`(roundn N [ND])`
Nearest number within a given precision, the number of decimal digits in the fraction ND. When precision missing normal 'round' is performed.

`fpfzroundn` [macro]
`(fpfzroundn N [ND])`
Nearest number within a given precision, the number of decimal digits in the fraction ND, & epsilon. When precision missing normal 'round' is performed.

`fpzceil` [macro]

(`fpzceil` N)

Smallest integer number that is tolerably larger than the given value.

`fpzfloor` [procedure]

(`fpzfloor` N)

Smallest integer number that is tolerably smaller than the given value.

`fpmaxabs` [macro]

(`fpmaxabs` A B)

Minimum of the absolute value of the arguments.

`calculate-fpz-epsilon` [procedure]

(`calculate-fpz-epsilon` [FEPS 3.0])

Returns the system epsilon to within a factor of the real epsilon.

3 License

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