Contents

Chapter 1

Classes

1.1 intresidue – integer residue

intresidue module provides integer residue classes or $\mathbf{Z}/m\mathbf{Z}$.

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1.1.1 IntegerResidueClass – integer residue class

This class is a subclass of **CommutativeRingElement**.

Initialize (Constructor)

IntegerResidueClass(representative: *integer*, modulus: *integer*)
$\rightarrow$ ***Integer***

Create a residue class of modulus with residue representative.
modulus must be positive integer.

Operations

operator	explanation
a+b	addition.
a-b	subtraction.
a*b	multiplication.
a/b	division.
a**i,pow(a,i)	power.
-a	negation.
+a	make a copy.
a==b	equality or not.
a!=b	inequality or not.
repr(a)	return representation string.
str(a)	return string.

Methods

1.1.1.1   getRing – get ring object

getRing(self) → *IntegerResidueClassRing*

   Return a ring to which it belongs.

1.1.1.2   getResidue – get residue

getResidue(self) → *integer*

   Return the value of residue.

1.1.1.3   getModulus – get modulus

getModulus(self) → *integer*

   Return the value of modulus.

1.1.1.4   inverse – inverse element

inverse(self) → *IntegerResidueClass*

   Return the inverse element if it is invertible. Otherwise raise ValueError.

1.1.1.5   minimumAbsolute – minimum absolute representative

minimumAbsolute(self) → Integer

   Return the minimum absolute representative integer of the residue class.

1.1.1.6   minimumNonNegative – smallest non-negative representative

minimumNonNegative(self) → Integer

   Return the smallest non-negative representative element of the residue class.
†this method has an alias, named toInteger.

1.1.2 IntegerResidueClassRing – ring of integer residue

The class is for rings of integer residue classes.

This class is a subclass of **CommutativeRing**.

Initialize (Constructor)

IntegerResidueClassRing(modulus: *integer*) → *IntegerResidueClassRing*

Create an instance of IntegerResidueClassRing. The argument `modulus` $= m$ specifies an ideal $m\mathbb{Z}$.

Attribute

zero :
   It expresses The additive unit 0. (read only)

one :
   It expresses The multiplicative unit 1. (read only)

Operations

operator	explanation
`R==A`	ring equality.
`card(R)`	return cardinality. See also **compatibility** module.
`e in R`	return whether an element is in or not.
`repr(R)`	return representation string.
`str(R)`	return string.

Methods

1.1.2.1 createElement – create IntegerResidueClass object

createElement(self, seed: *integer*) → *Integer*

Return an IntegerResidueClass instance with `seed`.

1.1.2.2 isfield – field test

isfield(self) → *bool*

Return True if the modulus is prime, False if not. Since a finite domain is a field, other ring property tests are merely aliases of isfield; they are isdomain, iseuclidean, isnoetherian, ispid, isufd.

1.1.2.3 getInstance – get instance of IntegerResidueClassRing

getInstance(cls, modulus: *integer*) → *IntegerResidueClass*

Return an instance of the class of specified modulus. Since this is a class method, use it as:

    IntegerResidueClassRing.getInstance(3)

to create a $\mathbb{Z}/3\mathbb{Z}$ object, for example.