



libbaltcalc usage and API manual

libbaltcalc v3.1.0 (manual version 1.0)

Originally Written By:

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Table of Contents

History.....	4
Introduction.....	5
Libbaltcalc API.....	5
Functions:.....	5
btint class:.....	7
methods.....	7
Supported built-in methods:.....	8
GNU Free Documentation License.....	9

History

v1.0 initial version of manual

Introduction

libbaltcalc is the mathematics backbone of the SBTCVM project. It provides the very core mathematics operations that make everything from the assembler, to the calculator, to the virtual machine itself, work at all. In this manual, you will find the official formal documentation for this ever important component.

Libbaltcalc API

Functions:

BTTODEC(btinteger)	Convert Balanced ternary integer to decimal
DECTOBT(decinteger)	Convert Decimal integer to balanced ternary
btmul(numA, numB)	Multiply two balanced ternary integers
btadd(numA, numB)	Add two balanced ternary integers
btsb(numA, numB)	Subtract two balanced ternary integers
btdivcpu(numA, numB)	Divide two balanced ternary integers. Returns "ZDIV" upon zero division.
btdiv(numA, numB)	Divide two balanced ternary integers. Returns "Zero Division Error" upon zero division.
BTINVERT(numtoinvert)	Invert balanced ternary integer to its opposite. i.e. "-+" would invert to "+-"
progbiasand(polarset, inpA, inpB)	A "programmable" biased and gate. returns a positive if: input a (inpA) = input b (inpB) = polarity line (polarset) else it returns zero
polarityand(inpA, inpB)	A polarized and gate returns + if both input A (inpA) and input B (inpB) = + returns - if both input A (inpA) and input B (inpB) = - otherwise it returns zero
progbiasor(polarset, inpA, inpB)	A programmable biased or gate returns "+" if either or both inputs equal the polarity line (polarset) else it returns "0"
progbiasnor(polarset, inpA, inpB)	A programmable biased orn gate returns "+" if either equal the polarity line (polarset) returns "0" either if neither or both inputs equal the polarity line (polarset)

btint class:

Syntax:

<code>int1=btint("+ -")</code>	
<code>int2=btint(2)</code>	
<code>int3=btint(int2)</code>	

the btint class provides support for python's builtin integer mathematics methods, and some other methods.

methods

method	example/description	notes
<code>invert()</code>		(returns the balanced ternary inversion. i.e. -+0- becomes +-0+)
<code>dec()</code>		(explicitly returns a normal python integer)
<code>bt()</code>		(explicitly returns balanced ternary integer in string form.)
<code>copy()</code>	<code>btintC=btintA.copy()</code>	
<code>changeval(newval)</code>	<code>btintC.changeval("+ -")</code> <code>btintC.changeval(2)</code> <code>btintC.changeval(btintA)</code>	changes the internal value of a btint class instance.
<code>bttrunk(tritlen)</code>	<code>print btintA.bttrunk(12)</code>	preforms string-based ternary trit truncation and also pads resulting balanced ternary integer string with zeros. primarily useful for logic simulations.
<code>dectrunk(tritlen)</code>	<code>btintC=btintA.dectrunk(12)</code>	preforms mpi/mni limiting truncation

Supported built-in methods:

method	example/description	notes
<code>__str__</code>	i.e. <code>str(btintA)</code> , <code>print btintA</code>	(returns balanced ternary integer in string form.)
<code>__int__</code>	<code>int(btintA)</code>	(returns a normal python integer)
	(these mathematics methods return btint instances.)	
<code>__add__</code>	<code>btintC=btintA+btintB</code>	
<code>__sub__</code>	<code>btintC=btintA-btintB</code>	
<code>__truediv__</code> , <code>__div__</code> , <code>__floordiv__</code>	<code>btintC=btintA//btintB</code>	(limited to integers only as floating point operations are not yet supported)
<code>__mul__</code>	<code>btintC=btintA*btintB</code>	
<code>__abs__</code>	<code>btintC=abs(btintA)</code>	
<code>__neg__</code>	<code>btintC=-btintA</code>	
<code>__pos__</code>	<code>btintC=+btintA</code>	
<code>__invert__</code>	<code>btintC=~btintA</code>	(returns the tritwise inversion. i.e. -+0- becomes +-0+)
<code>__cmp__</code>	supports common comparison operators (i.e. <code>==</code> , <code>>=</code> , <code>></code> , <code><=</code> , <code><</code> , <code>!=</code>) if <code>btintA>=btintB</code> :	

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