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jminusminus

Class NBasicBlock

- [java.lang.Object](#)
- [jminusminus.NBasicBlock](#)

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```
class NBasicBlock
extends Object
```

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Representation of a block within a control flow graph.

- **Field Summary**

Fields	
Modifier and Type	Field and Description
boolean	active Is this block active?
int	bwdBranches Number of backward branches to this block.
NControlFlowGraph	cfg The control flow graph (cfg) that this block belongs to.
NBasicBlock	dom The dominator of this block.
int	fwdBranches Number of forward branches to this block.
ArrayList<Integer>	hir List of high-level (HIR) instructions in this block.

<code>int</code>	<code>id</code> Unique identifier of this block.
<code>boolean</code>	<code>isLoopHead</code> Is this block a loop head?
<code>boolean</code>	<code>isLoopTail</code> Is this block a loop tail?
<code>ArrayList<NLIRInstruction></code>	<code>lir</code> List of low-level (LIR) instructions in this block.
<code>BitSet</code>	<code>liveDef</code> All virtual registers locally defined within this block.
<code>BitSet</code>	<code>liveIn</code> All virtual registers live in the block.
<code>BitSet</code>	<code>liveOut</code> All virtual registers live outside the block.
<code>BitSet</code>	<code>liveUse</code> All virtual registers used before definition within this block.
<code>int[]</code>	<code>locals</code> The state array for this block that maps local variable index to the HIR instruction that last affected it.
<code>int</code>	<code>loopDepth</code> Depth of a loop.
<code>int</code>	<code>loopIndex</code> Index of a loop.
<code>ArrayList<NBasicBlock></code>	<code>predecessors</code> List of predecessor blocks.
<code>int</code>	<code>ref</code> Ref count of this block.
<code>ArrayList<NBasicBlock></code>	<code>successors</code> List of successor blocks.
<code>ArrayList<NTuple></code>	<code>tuples</code> List of tuples in this block.
<code>boolean</code>	<code>visited</code> Has this block been visited?

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• Constructor Summary

Constructors

Constructor and Description

`NBasicBlock`(`NControlFlowGraph` cfg, `int` id)
Construct a block given its unique identifier.

- **Method Summary**

Methods	
Modifier and Type	Method and Description
boolean	equals (NBasicBlock other) Is this block the same as the other block? Two blocks are the same if their ids are the same.
int	getFirstLIRInstId () The instruction identifier for the first LIR instruction.
NLIRInstruction	getInstruction (int id) Iterates through the lir array of this block, returning an NLIRInstruction with the specified id.
int	getLastLIRInstId () The instruction identifier for the last LIR instruction.
String	id () Return a string identifier of this block.
boolean	idIsFree (int id) Checks to see if there is an LIRInstruction with this id in the block's lir.
void	insertLIRInst (ILIRInstruction inst) Inserts an NLIRInstruction to the appropriate place in this block's lir array based on its id -- preserving order by id.
String	toString () Return a string representation of this block.
void	writeHirToStdOut (PrettyPrinter p) Write the HIR instructions in this block to STDOUT.
void	writeLirToStdOut (PrettyPrinter p) Write the LIR instructions in this block to STDOUT.
void	writeTuplesToStdOut (PrettyPrinter p) Write the tuples in this block to STDOUT.

- **Methods inherited from class java.lang.Object**

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

- **Field Detail**

- **cfg**

public NControlFlowGraph cfg

The control flow graph (cfg) that this block belongs to.

- **id**

public int id

Unique identifier of this block.

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- **tuples**

`publicArrayList<NTuple> tuples`

List of tuples in this block.

- **predecessors**

`publicArrayList<NBasicBlock> predecessors`

List of predecessor blocks.

- **successors**

`publicArrayList<NBasicBlock> successors`

List of successor blocks.

- **hir**

`publicArrayList<Integer> hir`

List of high-level (HIR) instructions in this block.

- **lir**

`publicArrayList<NLIRInstruction> lir`

List of low-level (LIR) instructions in this block.

- **locals**

`publicint[] locals`

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The state array for this block that maps local variable index to the HIR instruction that last affected it.

- **visited**

`publicboolean visited`

Has this block been visited?

- **active**

`publicboolean active`

Is this block active?

- **isLoopHead**

`publicboolean isLoopHead`

Is this block a loop head?

- **isLoopTail**

`publicboolean isLoopTail`

Is this block a loop tail?

- **loopIndex**

`publicint loopIndex`

Index of a loop.

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- **loopDepth**

public int loopDepth

Depth of a loop.

- **fwdBranches**

public int fwdBranches

Number of forward branches to this block.

- **bwdBranches**

public int bwdBranches

Number of backward branches to this block.

- **ref**

public int ref

Ref count of this block.

- **dom**

public [NBasicBlock](#) dom

The dominator of this block.

- **liveDef**

public [BitSet](#) liveDef

All virtual registers locally defined within this block.

- **liveUse**

public [BitSet](#) liveUse

All virtual registers used before definition within this block.

- **liveIn**

public [BitSet](#) liveIn

All virtual registers live in the block.

- **liveOut**

public [BitSet](#) liveOut

All virtual registers live outside the block.

- **Constructor Detail**

- **NBasicBlock**

```
public NBasicBlock(NControlFlowGraph cfg,
                  int id)
```

Construct a block given its unique identifier.

Parameters:

cfg - the cfg containing this block.

id - id of the block.

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- **Method Detail**

- **id**

```
publicStringid()
```

Return a string identifier of this block.

Returns:

string identifier of this block.

- **equals**

```
publicbooleanequals(NBasicBlockother)
```

Is this block the same as the other block? Two blocks are the same if their ids are the same.

Parameters:

other - the other block.

Returns:

true or false.

- **toString**

```
publicStringtoString()
```

Return a string representation of this block.

Overrides

toString in class Object

Returns:

string representation of this block.

- **writeTuplesToStdOut**

```
publicvoidwriteTuplesToStdOut(PrettyPrinterp)
```

Write the tuples in this block to STDOUT.

Parameters:

p - for pretty printing with indentation.

- **writeHirToStdOut**

```
publicvoidwriteHirToStdOut(PrettyPrinterp)
```

Write the HIR instructions in this block to STDOUT.

Parameters:

p - for pretty printing with indentation.

- **writeLirToStdOut**

```
publicvoidwriteLirToStdOut(PrettyPrinterp)
```

Write the LIR instructions in this block to STDOUT.

Parameters:

p - for pretty printing with indentation.

- **getFirstLIRInstId**

```
publicintgetFirstLIRInstId()
```

The instruction identifier for the first LIR instruction.

Returns:

the instruction identifier.

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- **getLastLIRInstId**

```
public int getLastLIRInstId()
```

The instruction identifier for the last LIR instruction.

Returns:

the instruction identifier.

- **getInstruction**

```
public NLIRInstruction getInstruction(int id)
```

Iterates through the lir array of this block, returning an NLIRInstruction with the specified id.

Parameters:

id - the id to look for.

Returns:

NLIRInstruction with the specified id, null if none matched.

- **idIsFree**

```
public boolean idIsFree(int id)
```

Checks to see if there is an LIRInstruction with this id in the block's lir.

Returns:

true or false.

- **insertLIRInst**

```
public void insertLIRInst(NLIRInstruction inst)
```

Inserts an NLIRInstruction to the appropriate place in this block's lir array based on its id — preserving order by id.

Parameters:

inst - the NLIRInstruction to be inserted.

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