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jminusminus

## Class CLInstruction

- [java.lang.Object](#)
  - [jminusminus.CLInstruction](#)
- Direct Known Subclasses:
  - [CLArithmeticInstruction](#), [CLArrayInstruction](#), [CLBitInstruction](#), [CLComparisonInstruction](#), [CLConversionInstruction](#), [CLFieldInstruction](#), [CLFlowControlInstruction](#), [CLLoadStoreInstruction](#), [CLMethodInstruction](#), [CLMiscInstruction](#), [CLObjectInstruction](#), [CLStackInstruction](#)

```
abstract class CLInstruction
extends Object
```

Representation of a JVM instruction. It stores the opcode and mnemonic of an instruction, its operand count (DYNAMIC if the instruction has variable number operands), pc (location counter), stack units (words produced - words consumed from the operand stack), and local variable index (IRRELEVANT if the instruction does not operate on local variables).

- **Field Summary**

Fields	
Modifier and Type	Field and Description

static	<b><a href="#">instructionInfo</a></b>
<b><a href="#">CLInsInfo</a></b> [ ]	For each JVM instruction, this array stores its opcode, mnemonic, number of operands (DYNAMIC for instructions with variable attribute count), local variable index (IRRELEVANT where not applicable), stack units, and instruction category.
protected	<b><a href="#">localVariableIndex</a></b>

int	Index of the local variable that this instruction refers to; applies only to instructions that operate on local variables.
protected String	<b>mnemonic</b> Mnemonic for this instruction.
protected int	<b>opcode</b> Opcode for this instruction.
protected int	<b>operandCount</b> Number of operands for this instruction; determined statically for all instructions except TABLESWITCH and LOOKUPSWITCH.
protected int	<b>pc</b> Location counter; index of this instruction within the code array of a method.
protected int	<b>stackUnits</b> Stack units; words produced - words consumed from the operand stack by this instruction.

- **Constructor Summary**

Constructors

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**CLInstruction()**

- **Method Summary**

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Modifier and Type	Method and Description
protected int	<b>byteAt</b> (int i, int byteNum) Return the byte from i at position byteNum.
static boolean	<b>isValid</b> (int opcode) Return true if the opcode is valid; false otherwise.
int	<b>localVariableIndex</b> () Return the local variable index for this instruction.
String	<b>mnemonic</b> () Return the mnemonic for this instruction.
int	<b>opcode</b> () Return the opcode for this instruction.
int	<b>operandCount</b> () Return the number of operands for this instruction.
int	<b>pc</b> () Return the pc for this instruction.
int	<b>stackUnits</b> ()

Return the stack units for this instruction.

```
abstract  
ArrayList<Integer>
```

```
toBytes()
```

Return the bytecode for this instruction.

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

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

- **Field Detail**

- **opcode**

`protected int opcode`

Opcode for this instruction.

- **mnemonic**

`protected String mnemonic`

Mnemonic for this instruction.

- **operandCount**

`protected int operandCount`

Number of operands for this instruction; determined statically for all instructions except TABLESWITCH and LOOKUPSWITCH.

- **pc**

`protected int pc`

Location counter; index of this instruction within the code array of a method.

- **stackUnits**

`protected int stackUnits`

Stack units; words produced - words consumed from the operand stack by this instruction.

- **localVariableIndex**

`protected int localVariableIndex`

Index of the local variable that this instruction refers to; applies only to instructions that operate on local variables.

- **instructionInfo**

`public static final CLInsInfo[] instructionInfo`

For each JVM instruction, this array stores its opcode, mnemonic, number of operands (DYNAMIC for instructions with variable attribute count), local variable index (IRRELEVANT where not applicable), stack units, and instruction category. For example, for IMUL, these parameters are IMUL, "imul", 0, IRRELEVANT, -1, ARITHMETIC1.

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- **Constructor Detail**

- **CLInstruction**

`CLInstruction()`

- **Method Detail**

- **isValid**

`public static boolean isValid(int opcode)`

Return true if the opcode is valid; false otherwise.

**Parameters:**

opcode - instruction opcode.

**Returns:**

true or false.

- **opcode**

`public int opcode()`

Return the opcode for this instruction.

**Returns:**

the opcode.

- **mnemonic**

`public String mnemonic()`

Return the mnemonic for this instruction.

**Returns:**

the mnemonic.

- **operandCount**

`public int operandCount()`

Return the number of operands for this instruction.

**Returns:**

number of operands.

- **pc**

`public int pc()`

Return the pc for this instruction.

**Returns:**

the pc.

- **stackUnits**

`public int stackUnits()`

Return the stack units for this instruction.

**Returns:**

the stack units.

- **localVariableIndex**

`public int localVariableIndex()`

Return the local variable index for this instruction.

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**Returns:**

the local variable index.

- **toBytes**

```
public abstract ArrayList<Integer>toBytes()
```

Return the bytecode for this instruction.

**Returns:**

bytecode.

- **byteAt**

```
protected int byteAt(int i,  
int byteNum)
```

Return the byte from i at position byteNum.

**Parameters:**

i - number whose individual byte is required.

byteNum - the byte to return; 1 (lower) - 4 (higher) instructions.

**Returns:**

the byte at the specified position.

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