| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/DataBuffer.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV CLASS**](http://docs.google.com/java/awt/image/CropImageFilter.html)   [**NEXT CLASS**](http://docs.google.com/java/awt/image/DataBufferByte.html) | [**FRAMES**](http://docs.google.com/index.html?java/awt/image/DataBuffer.html)    [**NO FRAMES**](http://docs.google.com/DataBuffer.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | [FIELD](#3znysh7) | [CONSTR](#2et92p0) | [METHOD](#tyjcwt) | DETAIL: [FIELD](#1t3h5sf) | [CONSTR](#1y810tw) | [METHOD](#2bn6wsx) |

## **java.awt.image**

Class DataBuffer

[java.lang.Object](http://docs.google.com/java/lang/Object.html)  
 **java.awt.image.DataBuffer**

**Direct Known Subclasses:** [DataBufferByte](http://docs.google.com/java/awt/image/DataBufferByte.html), [DataBufferDouble](http://docs.google.com/java/awt/image/DataBufferDouble.html), [DataBufferFloat](http://docs.google.com/java/awt/image/DataBufferFloat.html), [DataBufferInt](http://docs.google.com/java/awt/image/DataBufferInt.html), [DataBufferShort](http://docs.google.com/java/awt/image/DataBufferShort.html), [DataBufferUShort](http://docs.google.com/java/awt/image/DataBufferUShort.html)

public abstract class **DataBuffer**extends [Object](http://docs.google.com/java/lang/Object.html)

This class exists to wrap one or more data arrays. Each data array in the DataBuffer is referred to as a bank. Accessor methods for getting and setting elements of the DataBuffer's banks exist with and without a bank specifier. The methods without a bank specifier use the default 0th bank. The DataBuffer can optionally take an offset per bank, so that data in an existing array can be used even if the interesting data doesn't start at array location zero. Getting or setting the 0th element of a bank, uses the (0+offset)th element of the array. The size field specifies how much of the data array is available for use. Size + offset for a given bank should never be greater than the length of the associated data array. The data type of a data buffer indicates the type of the data array(s) and may also indicate additional semantics, e.g. storing unsigned 8-bit data in elements of a byte array. The data type may be TYPE\_UNDEFINED or one of the types defined below. Other types may be added in the future. Generally, an object of class DataBuffer will be cast down to one of its data type specific subclasses to access data type specific methods for improved performance. Currently, the Java 2D(tm) API image classes use TYPE\_BYTE, TYPE\_USHORT, TYPE\_INT, TYPE\_SHORT, TYPE\_FLOAT, and TYPE\_DOUBLE DataBuffers to store image data.

**See Also:**[Raster](http://docs.google.com/java/awt/image/Raster.html), [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html)

| **Field Summary** | |
| --- | --- |
| protected  int | [**banks**](http://docs.google.com/java/awt/image/DataBuffer.html#banks)            The number of banks in this DataBuffer. |
| protected  int | [**dataType**](http://docs.google.com/java/awt/image/DataBuffer.html#dataType)            The data type of this DataBuffer. |
| protected  int | [**offset**](http://docs.google.com/java/awt/image/DataBuffer.html#offset)            Offset into default (first) bank from which to get the first element. |
| protected  int[] | [**offsets**](http://docs.google.com/java/awt/image/DataBuffer.html#offsets)            Offsets into all banks. |
| protected  int | [**size**](http://docs.google.com/java/awt/image/DataBuffer.html#size)            Usable size of all banks. |
| static int | [**TYPE\_BYTE**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_BYTE)            Tag for unsigned byte data. |
| static int | [**TYPE\_DOUBLE**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_DOUBLE)            Tag for double data. |
| static int | [**TYPE\_FLOAT**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_FLOAT)            Tag for float data. |
| static int | [**TYPE\_INT**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_INT)            Tag for int data. |
| static int | [**TYPE\_SHORT**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_SHORT)            Tag for signed short data. |
| static int | [**TYPE\_UNDEFINED**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_UNDEFINED)            Tag for undefined data. |
| static int | [**TYPE\_USHORT**](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_USHORT)            Tag for unsigned short data. |

| **Constructor Summary** | |
| --- | --- |
| protected | [**DataBuffer**](http://docs.google.com/java/awt/image/DataBuffer.html#DataBuffer(int,%20int))(int dataType, int size)            Constructs a DataBuffer containing one bank of the specified data type and size. |
| protected | [**DataBuffer**](http://docs.google.com/java/awt/image/DataBuffer.html#DataBuffer(int,%20int,%20int))(int dataType, int size, int numBanks)            Constructs a DataBuffer containing the specified number of banks. |
| protected | [**DataBuffer**](http://docs.google.com/java/awt/image/DataBuffer.html#DataBuffer(int,%20int,%20int,%20int))(int dataType, int size, int numBanks, int offset)            Constructs a DataBuffer that contains the specified number of banks. |
| protected | [**DataBuffer**](http://docs.google.com/java/awt/image/DataBuffer.html#DataBuffer(int,%20int,%20int,%20int%5B%5D))(int dataType, int size, int numBanks, int[] offsets)            Constructs a DataBuffer which contains the specified number of banks. |

| **Method Summary** | |
| --- | --- |
| int | [**getDataType**](http://docs.google.com/java/awt/image/DataBuffer.html#getDataType())()            Returns the data type of this DataBuffer. |
| static int | [**getDataTypeSize**](http://docs.google.com/java/awt/image/DataBuffer.html#getDataTypeSize(int))(int type)            Returns the size (in bits) of the data type, given a datatype tag. |
| int | [**getElem**](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int))(int i)            Returns the requested data array element from the first (default) bank as an integer. |
| abstract  int | [**getElem**](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int,%20int))(int bank, int i)            Returns the requested data array element from the specified bank as an integer. |
| double | [**getElemDouble**](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int))(int i)            Returns the requested data array element from the first (default) bank as a double. |
| double | [**getElemDouble**](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int,%20int))(int bank, int i)            Returns the requested data array element from the specified bank as a double. |
| float | [**getElemFloat**](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int))(int i)            Returns the requested data array element from the first (default) bank as a float. |
| float | [**getElemFloat**](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int,%20int))(int bank, int i)            Returns the requested data array element from the specified bank as a float. |
| int | [**getNumBanks**](http://docs.google.com/java/awt/image/DataBuffer.html#getNumBanks())()            Returns the number of banks in this DataBuffer. |
| int | [**getOffset**](http://docs.google.com/java/awt/image/DataBuffer.html#getOffset())()            Returns the offset of the default bank in array elements. |
| int[] | [**getOffsets**](http://docs.google.com/java/awt/image/DataBuffer.html#getOffsets())()            Returns the offsets (in array elements) of all the banks. |
| int | [**getSize**](http://docs.google.com/java/awt/image/DataBuffer.html#getSize())()            Returns the size (in array elements) of all banks. |
| void | [**setElem**](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int))(int i, int val)            Sets the requested data array element in the first (default) bank from the given integer. |
| abstract  void | [**setElem**](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int,%20int))(int bank, int i, int val)            Sets the requested data array element in the specified bank from the given integer. |
| void | [**setElemDouble**](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20double))(int i, double val)            Sets the requested data array element in the first (default) bank from the given double. |
| void | [**setElemDouble**](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20int,%20double))(int bank, int i, double val)            Sets the requested data array element in the specified bank from the given double. |
| void | [**setElemFloat**](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20float))(int i, float val)            Sets the requested data array element in the first (default) bank from the given float. |
| void | [**setElemFloat**](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20int,%20float))(int bank, int i, float val)            Sets the requested data array element in the specified bank from the given float. |

| **Methods inherited from class java.lang.**[**Object**](http://docs.google.com/java/lang/Object.html) |
| --- |
| [clone](http://docs.google.com/java/lang/Object.html#clone()), [equals](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)), [finalize](http://docs.google.com/java/lang/Object.html#finalize()), [getClass](http://docs.google.com/java/lang/Object.html#getClass()), [hashCode](http://docs.google.com/java/lang/Object.html#hashCode()), [notify](http://docs.google.com/java/lang/Object.html#notify()), [notifyAll](http://docs.google.com/java/lang/Object.html#notifyAll()), [toString](http://docs.google.com/java/lang/Object.html#toString()), [wait](http://docs.google.com/java/lang/Object.html#wait()), [wait](http://docs.google.com/java/lang/Object.html#wait(long)), [wait](http://docs.google.com/java/lang/Object.html#wait(long,%20int)) |

| **Field Detail** |
| --- |

### TYPE\_BYTE

public static final int **TYPE\_BYTE**

Tag for unsigned byte data.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_BYTE)

### TYPE\_USHORT

public static final int **TYPE\_USHORT**

Tag for unsigned short data.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_USHORT)

### TYPE\_SHORT

public static final int **TYPE\_SHORT**

Tag for signed short data. Placeholder for future use.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_SHORT)

### TYPE\_INT

public static final int **TYPE\_INT**

Tag for int data.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_INT)

### TYPE\_FLOAT

public static final int **TYPE\_FLOAT**

Tag for float data. Placeholder for future use.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_FLOAT)

### TYPE\_DOUBLE

public static final int **TYPE\_DOUBLE**

Tag for double data. Placeholder for future use.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_DOUBLE)

### TYPE\_UNDEFINED

public static final int **TYPE\_UNDEFINED**

Tag for undefined data.

**See Also:**[Constant Field Values](http://docs.google.com/constant-values.html#java.awt.image.DataBuffer.TYPE_UNDEFINED)

### dataType

protected int **dataType**

The data type of this DataBuffer.

### banks

protected int **banks**

The number of banks in this DataBuffer.

### offset

protected int **offset**

Offset into default (first) bank from which to get the first element.

### size

protected int **size**

Usable size of all banks.

### offsets

protected int[] **offsets**

Offsets into all banks.

| **Constructor Detail** |
| --- |

### DataBuffer

protected **DataBuffer**(int dataType,  
 int size)

Constructs a DataBuffer containing one bank of the specified data type and size.

**Parameters:**dataType - the data type of this DataBuffersize - the size of the banks

### DataBuffer

protected **DataBuffer**(int dataType,  
 int size,  
 int numBanks)

Constructs a DataBuffer containing the specified number of banks. Each bank has the specified size and an offset of 0.

**Parameters:**dataType - the data type of this DataBuffersize - the size of the banksnumBanks - the number of banks in this DataBuffer

### DataBuffer

protected **DataBuffer**(int dataType,  
 int size,  
 int numBanks,  
 int offset)

Constructs a DataBuffer that contains the specified number of banks. Each bank has the specified datatype, size and offset.

**Parameters:**dataType - the data type of this DataBuffersize - the size of the banksnumBanks - the number of banks in this DataBufferoffset - the offset for each bank

### DataBuffer

protected **DataBuffer**(int dataType,  
 int size,  
 int numBanks,  
 int[] offsets)

Constructs a DataBuffer which contains the specified number of banks. Each bank has the specified datatype and size. The offset for each bank is specified by its respective entry in the offsets array.

**Parameters:**dataType - the data type of this DataBuffersize - the size of the banksnumBanks - the number of banks in this DataBufferoffsets - an array containing an offset for each bank. **Throws:** [ArrayIndexOutOfBoundsException](http://docs.google.com/java/lang/ArrayIndexOutOfBoundsException.html) - if numBanks does not equal the length of offsets

| **Method Detail** |
| --- |

### getDataTypeSize

public static int **getDataTypeSize**(int type)

Returns the size (in bits) of the data type, given a datatype tag.

**Parameters:**type - the value of one of the defined datatype tags **Returns:**the size of the data type **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if type is less than zero or greater than [TYPE\_DOUBLE](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_DOUBLE)

### getDataType

public int **getDataType**()

Returns the data type of this DataBuffer.

**Returns:**the data type of this DataBuffer.

### getSize

public int **getSize**()

Returns the size (in array elements) of all banks.

**Returns:**the size of all banks.

### getOffset

public int **getOffset**()

Returns the offset of the default bank in array elements.

**Returns:**the offset of the default bank.

### getOffsets

public int[] **getOffsets**()

Returns the offsets (in array elements) of all the banks.

**Returns:**the offsets of all banks.

### getNumBanks

public int **getNumBanks**()

Returns the number of banks in this DataBuffer.

**Returns:**the number of banks.

### getElem

public int **getElem**(int i)

Returns the requested data array element from the first (default) bank as an integer.

**Parameters:**i - the index of the requested data array element **Returns:**the data array element at the specified index.**See Also:**[setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)), [setElem(int, int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int,%20int))

### getElem

public abstract int **getElem**(int bank,  
 int i)

Returns the requested data array element from the specified bank as an integer.

**Parameters:**bank - the specified banki - the index of the requested data array element **Returns:**the data array element at the specified index from the specified bank at the specified index.**See Also:**[setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)), [setElem(int, int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int,%20int))

### setElem

public void **setElem**(int i,  
 int val)

Sets the requested data array element in the first (default) bank from the given integer.

**Parameters:**i - the specified index into the data arrayval - the data to set the element at the specified index in the data array**See Also:**[getElem(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int)), [getElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int,%20int))

### setElem

public abstract void **setElem**(int bank,  
 int i,  
 int val)

Sets the requested data array element in the specified bank from the given integer.

**Parameters:**bank - the specified banki - the specified index into the data arrayval - the data to set the element in the specified bank at the specified index in the data array**See Also:**[getElem(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int)), [getElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int,%20int))

### getElemFloat

public float **getElemFloat**(int i)

Returns the requested data array element from the first (default) bank as a float. The implementation in this class is to cast getElem(i) to a float. Subclasses may override this method if another implementation is needed.

**Parameters:**i - the index of the requested data array element **Returns:**a float value representing the data array element at the specified index.**See Also:**[setElemFloat(int, float)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20float)), [setElemFloat(int, int, float)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20int,%20float))

### getElemFloat

public float **getElemFloat**(int bank,  
 int i)

Returns the requested data array element from the specified bank as a float. The implementation in this class is to cast [getElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int,%20int)) to a float. Subclasses can override this method if another implementation is needed.

**Parameters:**bank - the specified banki - the index of the requested data array element **Returns:**a float value representing the data array element from the specified bank at the specified index.**See Also:**[setElemFloat(int, float)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20float)), [setElemFloat(int, int, float)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemFloat(int,%20int,%20float))

### setElemFloat

public void **setElemFloat**(int i,  
 float val)

Sets the requested data array element in the first (default) bank from the given float. The implementation in this class is to cast val to an int and call [setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)). Subclasses can override this method if another implementation is needed.

**Parameters:**i - the specified indexval - the value to set the element at the specified index in the data array**See Also:**[getElemFloat(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int)), [getElemFloat(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int,%20int))

### setElemFloat

public void **setElemFloat**(int bank,  
 int i,  
 float val)

Sets the requested data array element in the specified bank from the given float. The implementation in this class is to cast val to an int and call [setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)). Subclasses can override this method if another implementation is needed.

**Parameters:**bank - the specified banki - the specified indexval - the value to set the element in the specified bank at the specified index in the data array**See Also:**[getElemFloat(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int)), [getElemFloat(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemFloat(int,%20int))

### getElemDouble

public double **getElemDouble**(int i)

Returns the requested data array element from the first (default) bank as a double. The implementation in this class is to cast [getElem(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElem(int)) to a double. Subclasses can override this method if another implementation is needed.

**Parameters:**i - the specified index **Returns:**a double value representing the element at the specified index in the data array.**See Also:**[setElemDouble(int, double)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20double)), [setElemDouble(int, int, double)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20int,%20double))

### getElemDouble

public double **getElemDouble**(int bank,  
 int i)

Returns the requested data array element from the specified bank as a double. The implementation in this class is to cast getElem(bank, i) to a double. Subclasses may override this method if another implementation is needed.

**Parameters:**bank - the specified banki - the specified index **Returns:**a double value representing the element from the specified bank at the specified index in the data array.**See Also:**[setElemDouble(int, double)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20double)), [setElemDouble(int, int, double)](http://docs.google.com/java/awt/image/DataBuffer.html#setElemDouble(int,%20int,%20double))

### setElemDouble

public void **setElemDouble**(int i,  
 double val)

Sets the requested data array element in the first (default) bank from the given double. The implementation in this class is to cast val to an int and call [setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)). Subclasses can override this method if another implementation is needed.

**Parameters:**i - the specified indexval - the value to set the element at the specified index in the data array**See Also:**[getElemDouble(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int)), [getElemDouble(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int,%20int))

### setElemDouble

public void **setElemDouble**(int bank,  
 int i,  
 double val)

Sets the requested data array element in the specified bank from the given double. The implementation in this class is to cast val to an int and call [setElem(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#setElem(int,%20int)). Subclasses can override this method if another implementation is needed.

**Parameters:**bank - the specified banki - the specified indexval - the value to set the element in the specified bank at the specified index of the data array**See Also:**[getElemDouble(int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int)), [getElemDouble(int, int)](http://docs.google.com/java/awt/image/DataBuffer.html#getElemDouble(int,%20int))

| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/DataBuffer.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| SUMMARY: NESTED | [FIELD](#3znysh7) | [CONSTR](#2et92p0) | [METHOD](#tyjcwt) | DETAIL: [FIELD](#1t3h5sf) | [CONSTR](#1y810tw) | [METHOD](#2bn6wsx) |

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For further API reference and developer documentation, see [Java SE Developer Documentation](http://docs.google.com/webnotes/devdocs-vs-specs.html). That documentation contains more detailed, developer-targeted descriptions, with conceptual overviews, definitions of terms, workarounds, and working code examples.

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