| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/XMLGregorianCalendar.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/javax/xml/datatype/Duration.html)   NEXT CLASS | [**FRAMES**](http://docs.google.com/index.html?javax/xml/datatype/XMLGregorianCalendar.html)    [**NO FRAMES**](http://docs.google.com/XMLGregorianCalendar.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | FIELD | [CONSTR](#3rdcrjn) | [METHOD](#26in1rg) | DETAIL: FIELD | [CONSTR](#35nkun2) | [METHOD](#44sinio) |

## **javax.xml.datatype**

Class XMLGregorianCalendar

[java.lang.Object](http://docs.google.com/java/lang/Object.html)  
 **javax.xml.datatype.XMLGregorianCalendar**

**All Implemented Interfaces:** [Cloneable](http://docs.google.com/java/lang/Cloneable.html)

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

Representation for W3C XML Schema 1.0 date/time datatypes. Specifically, these date/time datatypes are [DatatypeConstants.DATETIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATETIME), [DatatypeConstants.TIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#TIME), [DatatypeConstants.DATE](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATE), [DatatypeConstants.GYEARMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEARMONTH), [DatatypeConstants.GMONTHDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTHDAY), [DatatypeConstants.GYEAR](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEAR), [DatatypeConstants.GMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTH), and [DatatypeConstants.GDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GDAY) defined in the XML Namespace "http://www.w3.org/2001/XMLSchema". These datatypes are normatively defined in [W3C XML Schema 1.0 Part 2, Section 3.2.7-14](http://www.w3.org/TR/xmlschema-2/#dateTime).

The table below defines the mapping between XML Schema 1.0 date/time datatype fields and this class' fields. It also summarizes the value constraints for the date and time fields defined in [W3C XML Schema 1.0 Part 2, Appendix D, *ISO 8601 Date and Time Formats*](http://www.w3.org/TR/xmlschema-2/#isoformats).

| Date/Time Datatype Field Mapping Between XML Schema 1.0 and Java Representation | | |
| --- | --- | --- |
| XML Schema 1.0  datatype  field | Related  XMLGregorianCalendar  Accessor(s) | Value Range |
| year | [getYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getYear()) + [getEon()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEon()) or  [getEonAndYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear()) | getYear() is a value between -(10^9-1) to (10^9)-1 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).  [getEon()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEon()) is high order year value in billion of years.  getEon() has values greater than or equal to (10^9) or less than or equal to -(10^9). A value of null indicates field is undefined.  Given that [XML Schema 1.0 errata](http://www.w3.org/2001/05/xmlschema-errata#e2-63) states that the year zero will be a valid lexical value in a future version of XML Schema, this class allows the year field to be set to zero. Otherwise, the year field value is handled exactly as described in the errata and [ISO-8601-1988]. Note that W3C XML Schema 1.0 validation does not allow for the year field to have a value of zero. |
| month | [getMonth()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMonth()) | 1 to 12 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) |
| day | [getDay()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getDay()) | Independent of month, max range is 1 to 31 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).  The normative value constraint stated relative to month field's value is in [W3C XML Schema 1.0 Part 2, Appendix D](http://www.w3.org/TR/xmlschema-2/#isoformats). |
| hour | [getHour()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getHour()) | 0 to 24 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). For a value of 24, the minute and second field must be zero per [XML Schema Errata](http://www.w3.org/2001/05/xmlschema-errata#e2-45). |
| minute | [getMinute()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMinute()) | 0 to 59 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) |
| second | [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()) + [getMillisecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMillisecond())/1000 or  [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()) + [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()) | [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()) from 0 to 60 or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).  *(Note: 60 only allowable for leap second.)*  [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()) allows for infinite precision over the range from 0.0 to 1.0 when the [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()) is defined.  FractionalSecond is optional and has a value of null when it is undefined.  [getMillisecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMillisecond()) is the convenience millisecond precision of value of [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()). |
| timezone | [getTimezone()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getTimezone()) | Number of minutes or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). Value range from -14 hours (-14 \* 60 minutes) to 14 hours (14 \* 60 minutes). |

All maximum value space constraints listed for the fields in the table above are checked by factory methods, @{link DatatypeFactory}, setter methods and parse methods of this class. IllegalArgumentException is thrown when a parameter's value is outside the value constraint for the field or if the composite values constitute an invalid XMLGregorianCalendar instance (for example, if the 31st of June is specified).

The following operations are defined for this class:

* accessors/mutators for independent date/time fields
* conversion between this class and W3C XML Schema 1.0 lexical representation, [toString()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toString()), [DatatypeFactory.newXMLGregorianCalendar(String lexicalRepresentation)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar(java.lang.String))
* conversion between this class and [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html), [toGregorianCalendar(java.util.TimeZone timezone, java.util.Locale aLocale, XMLGregorianCalendar defaults)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toGregorianCalendar(java.util.TimeZone,%20java.util.Locale,%20javax.xml.datatype.XMLGregorianCalendar)), [DatatypeFactory](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html)
* partial order relation comparator method, [compare(XMLGregorianCalendar xmlGregorianCalendar)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#compare(javax.xml.datatype.XMLGregorianCalendar))
* [equals(Object)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#equals(java.lang.Object)) defined relative to [compare(XMLGregorianCalendar xmlGregorianCalendar)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#compare(javax.xml.datatype.XMLGregorianCalendar)).
* addition operation with [Duration](http://docs.google.com/javax/xml/datatype/Duration.html) instance as defined in  [W3C XML Schema 1.0 Part 2, Appendix E, *Adding durations to dateTimes*](http://www.w3.org/TR/xmlschema-2/#adding-durations-to-dateTimes).

**Since:** 1.5 **See Also:**[Duration](http://docs.google.com/javax/xml/datatype/Duration.html), [DatatypeFactory](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html)

| **Constructor Summary** | |
| --- | --- |
| [**XMLGregorianCalendar**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#XMLGregorianCalendar())()            Default no-arg constructor. |

| **Method Summary** | |
| --- | --- |
| abstract  void | [**add**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#add(javax.xml.datatype.Duration))([Duration](http://docs.google.com/javax/xml/datatype/Duration.html) duration)            Add duration to this instance. |
| abstract  void | [**clear**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#clear())()            Unset all fields to undefined. |
| abstract  [Object](http://docs.google.com/java/lang/Object.html) | [**clone**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#clone())()            Creates and returns a copy of this object. |
| abstract  int | [**compare**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#compare(javax.xml.datatype.XMLGregorianCalendar))([XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) xmlGregorianCalendar)            Compare two instances of W3C XML Schema 1.0 date/time datatypes according to partial order relation defined in [W3C XML Schema 1.0 Part 2, Section 3.2.7.3, *Order relation on dateTime*](http://www.w3.org/TR/xmlschema-2/#dateTime-order). |
| boolean | [**equals**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#equals(java.lang.Object))([Object](http://docs.google.com/java/lang/Object.html) obj)            Compares this calendar to the specified object. |
| abstract  int | [**getDay**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getDay())()            Return day in month or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| abstract  [BigInteger](http://docs.google.com/java/math/BigInteger.html) | [**getEon**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEon())()            Return high order component for XML Schema 1.0 dateTime datatype field for year. |
| abstract  [BigInteger](http://docs.google.com/java/math/BigInteger.html) | [**getEonAndYear**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear())()            Return XML Schema 1.0 dateTime datatype field for year. |
| abstract  [BigDecimal](http://docs.google.com/java/math/BigDecimal.html) | [**getFractionalSecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond())()            Return fractional seconds. |
| abstract  int | [**getHour**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getHour())()            Return hours or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| int | [**getMillisecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMillisecond())()            Return millisecond precision of [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()). |
| abstract  int | [**getMinute**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMinute())()            Return minutes or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| abstract  int | [**getMonth**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMonth())()            Return number of month or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| abstract  int | [**getSecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond())()            Return seconds or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| abstract  int | [**getTimezone**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getTimezone())()            Return timezone offset in minutes or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) if this optional field is not defined. |
| abstract  [TimeZone](http://docs.google.com/java/util/TimeZone.html) | [**getTimeZone**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getTimeZone(int))(int defaultZoneoffset)            Returns a java.util.TimeZone for this class. |
| abstract  [QName](http://docs.google.com/javax/xml/namespace/QName.html) | [**getXMLSchemaType**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getXMLSchemaType())()            Return the name of the XML Schema date/time type that this instance maps to. |
| abstract  int | [**getYear**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getYear())()            Return low order component for XML Schema 1.0 dateTime datatype field for year or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). |
| int | [**hashCode**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#hashCode())()            Returns a hash code consistent with the definition of the equals method. |
| abstract  boolean | [**isValid**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#isValid())()            Validate instance by getXMLSchemaType() constraints. |
| abstract  [XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) | [**normalize**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#normalize())()            Normalize this instance to UTC. |
| abstract  void | [**reset**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#reset())()            Reset this XMLGregorianCalendar to its original values. |
| abstract  void | [**setDay**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setDay(int))(int day)            Set days in month. |
| abstract  void | [**setFractionalSecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setFractionalSecond(java.math.BigDecimal))([BigDecimal](http://docs.google.com/java/math/BigDecimal.html) fractional)            Set fractional seconds. |
| abstract  void | [**setHour**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setHour(int))(int hour)            Set hours. |
| abstract  void | [**setMillisecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setMillisecond(int))(int millisecond)            Set milliseconds. |
| abstract  void | [**setMinute**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setMinute(int))(int minute)            Set minutes. |
| abstract  void | [**setMonth**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setMonth(int))(int month)            Set month. |
| abstract  void | [**setSecond**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setSecond(int))(int second)            Set seconds. |
| void | [**setTime**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int))(int hour, int minute, int second)            Set time as one unit. |
| void | [**setTime**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int,%20java.math.BigDecimal))(int hour, int minute, int second, [BigDecimal](http://docs.google.com/java/math/BigDecimal.html) fractional)            Set time as one unit, including the optional infinite precision fractional seconds. |
| void | [**setTime**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int,%20int))(int hour, int minute, int second, int millisecond)            Set time as one unit, including optional milliseconds. |
| abstract  void | [**setTimezone**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTimezone(int))(int offset)            Set the number of minutes in the timezone offset. |
| abstract  void | [**setYear**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setYear(java.math.BigInteger))([BigInteger](http://docs.google.com/java/math/BigInteger.html) year)            Set low and high order component of XSD dateTime year field. |
| abstract  void | [**setYear**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setYear(int))(int year)            Set year of XSD dateTime year field. |
| abstract  [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) | [**toGregorianCalendar**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toGregorianCalendar())()            Convert this XMLGregorianCalendar to a [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html). |
| abstract  [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) | [**toGregorianCalendar**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toGregorianCalendar(java.util.TimeZone,%20java.util.Locale,%20javax.xml.datatype.XMLGregorianCalendar))([TimeZone](http://docs.google.com/java/util/TimeZone.html) timezone, [Locale](http://docs.google.com/java/util/Locale.html) aLocale, [XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) defaults)            Convert this XMLGregorianCalendar along with provided parameters to a [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) instance. |
| [String](http://docs.google.com/java/lang/String.html) | [**toString**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toString())()            Returns a String representation of this XMLGregorianCalendar Object. |
| abstract  [String](http://docs.google.com/java/lang/String.html) | [**toXMLFormat**](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toXMLFormat())()            Return the lexical representation of this instance. |

| **Methods inherited from class java.lang.**[**Object**](http://docs.google.com/java/lang/Object.html) |
| --- |
| [finalize](http://docs.google.com/java/lang/Object.html#finalize()), [getClass](http://docs.google.com/java/lang/Object.html#getClass()), [notify](http://docs.google.com/java/lang/Object.html#notify()), [notifyAll](http://docs.google.com/java/lang/Object.html#notifyAll()), [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)) |

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

### XMLGregorianCalendar

public **XMLGregorianCalendar**()

Default no-arg constructor.

Note: Always use the [DatatypeFactory](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html) to construct an instance of XMLGregorianCalendar. The constructor on this class cannot be guaranteed to produce an object with a consistent state and may be removed in the future.

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

### clear

public abstract void **clear**()

Unset all fields to undefined.

Set all int fields to [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) and reference fields to null.

### reset

public abstract void **reset**()

Reset this XMLGregorianCalendar to its original values.

XMLGregorianCalendar is reset to the same values as when it was created with [DatatypeFactory.newXMLGregorianCalendar()](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar()), [DatatypeFactory.newXMLGregorianCalendar(String lexicalRepresentation)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar(java.lang.String)), [DatatypeFactory.newXMLGregorianCalendar( BigInteger year, int month, int day, int hour, int minute, int second, BigDecimal fractionalSecond, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar(java.math.BigInteger,%20int,%20int,%20int,%20int,%20int,%20java.math.BigDecimal,%20int)), [DatatypeFactory.newXMLGregorianCalendar( int year, int month, int day, int hour, int minute, int second, int millisecond, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar(int,%20int,%20int,%20int,%20int,%20int,%20int,%20int)), [DatatypeFactory.newXMLGregorianCalendar(GregorianCalendar cal)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendar(java.util.GregorianCalendar)), [DatatypeFactory.newXMLGregorianCalendarDate( int year, int month, int day, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendarDate(int,%20int,%20int,%20int)), [DatatypeFactory.newXMLGregorianCalendarTime( int hours, int minutes, int seconds, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendarTime(int,%20int,%20int,%20int)), [DatatypeFactory.newXMLGregorianCalendarTime( int hours, int minutes, int seconds, BigDecimal fractionalSecond, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendarTime(int,%20int,%20int,%20java.math.BigDecimal,%20int)) or [DatatypeFactory.newXMLGregorianCalendarTime( int hours, int minutes, int seconds, int milliseconds, int timezone)](http://docs.google.com/javax/xml/datatype/DatatypeFactory.html#newXMLGregorianCalendarTime(int,%20int,%20int,%20int,%20int)).

reset() is designed to allow the reuse of existing XMLGregorianCalendars thus saving resources associated with the creation of new XMLGregorianCalendars.

### setYear

public abstract void **setYear**([BigInteger](http://docs.google.com/java/math/BigInteger.html) year)

Set low and high order component of XSD dateTime year field.

Unset this field by invoking the setter with a parameter value of null.

**Parameters:**year - value constraints summarized in [year field of date/time field mapping table](#2et92p0). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if year parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setYear

public abstract void **setYear**(int year)

Set year of XSD dateTime year field.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Note: if the absolute value of the year parameter is less than 10^9, the eon component of the XSD year field is set to null by this method.

**Parameters:**year - value constraints are summarized in [year field of date/time field mapping table](#2et92p0). If year is [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED), then eon is set to null.

### setMonth

public abstract void **setMonth**(int month)

Set month.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**month - value constraints summarized in [month field of date/time field mapping table](#tyjcwt). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if month parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setDay

public abstract void **setDay**(int day)

Set days in month.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**day - value constraints summarized in [day field of date/time field mapping table](#3dy6vkm). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if day parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setTimezone

public abstract void **setTimezone**(int offset)

Set the number of minutes in the timezone offset.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**offset - value constraints summarized in  [timezone field of date/time field mapping table](#17dp8vu). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if offset parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setTime

public void **setTime**(int hour,  
 int minute,  
 int second)

Set time as one unit.

**Parameters:**hour - value constraints are summarized in [hour field of date/time field mapping table](#1t3h5sf).minute - value constraints are summarized in [minute field of date/time field mapping table](#4d34og8).second - value constraints are summarized in [second field of date/time field mapping table](#2s8eyo1). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if any parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).**See Also:**[setTime(int, int, int, BigDecimal)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int,%20java.math.BigDecimal))

### setHour

public abstract void **setHour**(int hour)

Set hours.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**hour - value constraints summarized in [hour field of date/time field mapping table](#1t3h5sf). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if hour parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setMinute

public abstract void **setMinute**(int minute)

Set minutes.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**minute - value constraints summarized in [minute field of date/time field mapping table](#4d34og8). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if minute parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setSecond

public abstract void **setSecond**(int second)

Set seconds.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**second - value constraints summarized in [second field of date/time field mapping table](#2s8eyo1). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if second parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setMillisecond

public abstract void **setMillisecond**(int millisecond)

Set milliseconds.

Unset this field by invoking the setter with a parameter value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Parameters:**millisecond - value constraints summarized in [second field of date/time field mapping table](#2s8eyo1). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if millisecond parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setFractionalSecond

public abstract void **setFractionalSecond**([BigDecimal](http://docs.google.com/java/math/BigDecimal.html) fractional)

Set fractional seconds.

Unset this field by invoking the setter with a parameter value of null.

**Parameters:**fractional - value constraints summarized in [second field of date/time field mapping table](#2s8eyo1). **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if fractional parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setTime

public void **setTime**(int hour,  
 int minute,  
 int second,  
 [BigDecimal](http://docs.google.com/java/math/BigDecimal.html) fractional)

Set time as one unit, including the optional infinite precision fractional seconds.

**Parameters:**hour - value constraints are summarized in [hour field of date/time field mapping table](#1t3h5sf).minute - value constraints are summarized in [minute field of date/time field mapping table](#4d34og8).second - value constraints are summarized in [second field of date/time field mapping table](#2s8eyo1).fractional - value of null indicates this optional field is not set. **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if any parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### setTime

public void **setTime**(int hour,  
 int minute,  
 int second,  
 int millisecond)

Set time as one unit, including optional milliseconds.

**Parameters:**hour - value constraints are summarized in [hour field of date/time field mapping table](#1t3h5sf).minute - value constraints are summarized in [minute field of date/time field mapping table](#4d34og8).second - value constraints are summarized in [second field of date/time field mapping table](#2s8eyo1).millisecond - value of [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) indicates this optional field is not set. **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if any parameter is outside value constraints for the field as specified in [date/time field mapping table](#3znysh7).

### getEon

public abstract [BigInteger](http://docs.google.com/java/math/BigInteger.html) **getEon**()

Return high order component for XML Schema 1.0 dateTime datatype field for year. null if this optional part of the year field is not defined.

Value constraints for this value are summarized in [year field of date/time field mapping table](#2et92p0).

**Returns:**eon of this XMLGregorianCalendar. The value returned is an integer multiple of 10^9.**See Also:**[getYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getYear()), [getEonAndYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear())

### getYear

public abstract int **getYear**()

Return low order component for XML Schema 1.0 dateTime datatype field for year or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Value constraints for this value are summarized in [year field of date/time field mapping table](#2et92p0).

**Returns:**year of this XMLGregorianCalendar.**See Also:**[getEon()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEon()), [getEonAndYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear())

### getEonAndYear

public abstract [BigInteger](http://docs.google.com/java/math/BigInteger.html) **getEonAndYear**()

Return XML Schema 1.0 dateTime datatype field for year.

Value constraints for this value are summarized in [year field of date/time field mapping table](#2et92p0).

**Returns:**sum of eon and BigInteger.valueOf(year) when both fields are defined. When only year is defined, return it. When both eon and year are not defined, return null.**See Also:**[getEon()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEon()), [getYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getYear())

### getMonth

public abstract int **getMonth**()

Return number of month or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Value constraints for this value are summarized in [month field of date/time field mapping table](#tyjcwt).

**Returns:**year of this XMLGregorianCalendar.

### getDay

public abstract int **getDay**()

Return day in month or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Value constraints for this value are summarized in [day field of date/time field mapping table](#3dy6vkm).

**See Also:**[setDay(int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setDay(int))

### getTimezone

public abstract int **getTimezone**()

Return timezone offset in minutes or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) if this optional field is not defined.

Value constraints for this value are summarized in [timezone field of date/time field mapping table](#17dp8vu).

**See Also:**[setTimezone(int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTimezone(int))

### getHour

public abstract int **getHour**()

Return hours or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). Returns [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) if this field is not defined.

Value constraints for this value are summarized in [hour field of date/time field mapping table](#1t3h5sf).

**See Also:**[setTime(int, int, int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int))

### getMinute

public abstract int **getMinute**()

Return minutes or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Returns [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) if this field is not defined.

Value constraints for this value are summarized in [minute field of date/time field mapping table](#4d34og8).

**See Also:**[setTime(int, int, int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int))

### getSecond

public abstract int **getSecond**()

Return seconds or [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Returns [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED) if this field is not defined. When this field is not defined, the optional xs:dateTime fractional seconds field, represented by [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()) and [getMillisecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMillisecond()), must not be defined.

Value constraints for this value are summarized in [second field of date/time field mapping table](#2s8eyo1).

**Returns:**Second of this XMLGregorianCalendar.**See Also:**[getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()), [getMillisecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMillisecond()), [setTime(int, int, int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int))

### getMillisecond

public int **getMillisecond**()

Return millisecond precision of [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()).

This method represents a convenience accessor to infinite precision fractional second value returned by [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()). The returned value is the rounded down to milliseconds value of [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()). When [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()) returns null, this method must return [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

Value constraints for this value are summarized in [second field of date/time field mapping table](#2s8eyo1).

**Returns:**Millisecond of this XMLGregorianCalendar.**See Also:**[getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond()), [setTime(int, int, int)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int))

### getFractionalSecond

public abstract [BigDecimal](http://docs.google.com/java/math/BigDecimal.html) **getFractionalSecond**()

Return fractional seconds.

null is returned when this optional field is not defined.

Value constraints are detailed in [second field of date/time field mapping table](#2s8eyo1).

This optional field can only have a defined value when the xs:dateTime second field, represented by [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()), does not return [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED).

**Returns:**fractional seconds of this XMLGregorianCalendar.**See Also:**[getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()), [setTime(int, int, int, BigDecimal)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#setTime(int,%20int,%20int,%20java.math.BigDecimal))

### compare

public abstract int **compare**([XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) xmlGregorianCalendar)

Compare two instances of W3C XML Schema 1.0 date/time datatypes according to partial order relation defined in [W3C XML Schema 1.0 Part 2, Section 3.2.7.3, *Order relation on dateTime*](http://www.w3.org/TR/xmlschema-2/#dateTime-order).

xsd:dateTime datatype field mapping to accessors of this class are defined in [date/time field mapping table](#3znysh7).

**Parameters:**xmlGregorianCalendar - Instance of XMLGregorianCalendar to compare **Returns:**The relationship between this XMLGregorianCalendar and the specified xmlGregorianCalendar as [DatatypeConstants.LESSER](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#LESSER), [DatatypeConstants.EQUAL](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#EQUAL), [DatatypeConstants.GREATER](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GREATER) or [DatatypeConstants.INDETERMINATE](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#INDETERMINATE). **Throws:** [NullPointerException](http://docs.google.com/java/lang/NullPointerException.html) - if xmlGregorianCalendar is null.

### normalize

public abstract [XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) **normalize**()

Normalize this instance to UTC.

2000-03-04T23:00:00+03:00 normalizes to 2000-03-04T20:00:00Z

Implements W3C XML Schema Part 2, Section 3.2.7.3 (A).

**Returns:**this XMLGregorianCalendar normalized to UTC.

### equals

public boolean **equals**([Object](http://docs.google.com/java/lang/Object.html) obj)

Compares this calendar to the specified object. The result is true if and only if the argument is not null and is an XMLGregorianCalendar object that represents the same instant in time as this object.

**Overrides:**[equals](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)) in class [Object](http://docs.google.com/java/lang/Object.html) **Parameters:**obj - to compare. **Returns:**true when obj is an instance of XMLGregorianCalendar and [compare(XMLGregorianCalendar obj)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#compare(javax.xml.datatype.XMLGregorianCalendar)) returns [DatatypeConstants.EQUAL](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#EQUAL), otherwise false.**See Also:**[Object.hashCode()](http://docs.google.com/java/lang/Object.html#hashCode()), [Hashtable](http://docs.google.com/java/util/Hashtable.html)

### hashCode

public int **hashCode**()

Returns a hash code consistent with the definition of the equals method.

**Overrides:**[hashCode](http://docs.google.com/java/lang/Object.html#hashCode()) in class [Object](http://docs.google.com/java/lang/Object.html) **Returns:**hash code of this object.**See Also:**[Object.equals(java.lang.Object)](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)), [Hashtable](http://docs.google.com/java/util/Hashtable.html)

### toXMLFormat

public abstract [String](http://docs.google.com/java/lang/String.html) **toXMLFormat**()

Return the lexical representation of this instance. The format is specified in [XML Schema 1.0 Part 2, Section 3.2.[7-14].1, *Lexical Representation*".](http://www.w3.org/TR/xmlschema-2/#dateTime-order)

Specific target lexical representation format is determined by [getXMLSchemaType()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getXMLSchemaType()).

**Returns:**XML, as String, representation of this XMLGregorianCalendar **Throws:** [IllegalStateException](http://docs.google.com/java/lang/IllegalStateException.html) - if the combination of set fields does not match one of the eight defined XML Schema builtin date/time datatypes.

### getXMLSchemaType

public abstract [QName](http://docs.google.com/javax/xml/namespace/QName.html) **getXMLSchemaType**()

Return the name of the XML Schema date/time type that this instance maps to. Type is computed based on fields that are set.

| Required fields for XML Schema 1.0 Date/Time Datatypes.  *(timezone is optional for all date/time datatypes)* | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Datatype | year | month | day | hour | minute | second |
| [DatatypeConstants.DATETIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATETIME) | X | X | X | X | X | X |
| [DatatypeConstants.DATE](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATE) | X | X | X |  |  |  |
| [DatatypeConstants.TIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#TIME) |  |  |  | X | X | X |
| [DatatypeConstants.GYEARMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEARMONTH) | X | X |  |  |  |  |
| [DatatypeConstants.GMONTHDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTHDAY) |  | X | X |  |  |  |
| [DatatypeConstants.GYEAR](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEAR) | X |  |  |  |  |  |
| [DatatypeConstants.GMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTH) |  | X |  |  |  |  |
| [DatatypeConstants.GDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GDAY) |  |  | X |  |  |  |

**Returns:**One of the following class constants: [DatatypeConstants.DATETIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATETIME), [DatatypeConstants.TIME](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#TIME), [DatatypeConstants.DATE](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#DATE), [DatatypeConstants.GYEARMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEARMONTH), [DatatypeConstants.GMONTHDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTHDAY), [DatatypeConstants.GYEAR](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GYEAR), [DatatypeConstants.GMONTH](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GMONTH) or [DatatypeConstants.GDAY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#GDAY). **Throws:** [IllegalStateException](http://docs.google.com/java/lang/IllegalStateException.html) - if the combination of set fields does not match one of the eight defined XML Schema builtin date/time datatypes.

### toString

public [String](http://docs.google.com/java/lang/String.html) **toString**()

Returns a String representation of this XMLGregorianCalendar Object.

The result is a lexical representation generated by [toXMLFormat()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toXMLFormat()).

**Overrides:**[toString](http://docs.google.com/java/lang/Object.html#toString()) in class [Object](http://docs.google.com/java/lang/Object.html) **Returns:**A non-null valid String representation of this XMLGregorianCalendar. **Throws:** [IllegalStateException](http://docs.google.com/java/lang/IllegalStateException.html) - if the combination of set fields does not match one of the eight defined XML Schema builtin date/time datatypes.**See Also:**[toXMLFormat()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toXMLFormat())

### isValid

public abstract boolean **isValid**()

Validate instance by getXMLSchemaType() constraints.

**Returns:**true if data values are valid.

### add

public abstract void **add**([Duration](http://docs.google.com/javax/xml/datatype/Duration.html) duration)

Add duration to this instance.

The computation is specified in [XML Schema 1.0 Part 2, Appendix E, *Adding durations to dateTimes*>](http://www.w3.org/TR/xmlschema-2/#adding-durations-to-dateTimes). [date/time field mapping table](#3znysh7) defines the mapping from XML Schema 1.0 dateTime fields to this class' representation of those fields.

**Parameters:**duration - Duration to add to this XMLGregorianCalendar. **Throws:** [NullPointerException](http://docs.google.com/java/lang/NullPointerException.html) - when duration parameter is null.

### toGregorianCalendar

public abstract [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) **toGregorianCalendar**()

Convert this XMLGregorianCalendar to a [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html).

When this instance has an undefined field, this conversion relies on the java.util.GregorianCalendar default for its corresponding field. A notable difference between XML Schema 1.0 date/time datatypes and java.util.GregorianCalendar is that Timezone value is optional for date/time datatypes and it is a required field for java.util.GregorianCalendar. See javadoc for java.util.TimeZone.getDefault() on how the default is determined. To explicitly specify the TimeZone instance, see [toGregorianCalendar(TimeZone, Locale, XMLGregorianCalendar)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toGregorianCalendar(java.util.TimeZone,%20java.util.Locale,%20javax.xml.datatype.XMLGregorianCalendar)).

| Field by Field Conversion from this class to java.util.GregorianCalendar | |
| --- | --- |
| java.util.GregorianCalendar field | javax.xml.datatype.XMLGregorianCalendar field |
| ERA | [getEonAndYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear()).signum() < 0 ? GregorianCalendar.BC : GregorianCalendar.AD |
| YEAR | [getEonAndYear()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getEonAndYear()).abs().intValue()*\** |
| MONTH | [getMonth()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMonth()) - [DatatypeConstants.JANUARY](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#JANUARY) + [Calendar.JANUARY](http://docs.google.com/java/util/Calendar.html#JANUARY) |
| DAY\_OF\_MONTH | [getDay()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getDay()) |
| HOUR\_OF\_DAY | [getHour()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getHour()) |
| MINUTE | [getMinute()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getMinute()) |
| SECOND | [getSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getSecond()) |
| MILLISECOND | get millisecond order from [getFractionalSecond()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getFractionalSecond())*\** |
| GregorianCalendar.setTimeZone(TimeZone) | [getTimezone()](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#getTimezone()) formatted into Custom timezone id |

*\** designates possible loss of precision during the conversion due to source datatype having higher precision than target datatype.

To ensure consistency in conversion implementations, the new GregorianCalendar should be instantiated in following manner.

* Using timeZone value as defined above, create a new java.util.GregorianCalendar(timeZone,Locale.getDefault()).
* Initialize all GregorianCalendar fields by calling [Calendar.clear()](http://docs.google.com/java/util/Calendar.html#clear()).
* Obtain a pure Gregorian Calendar by invoking GregorianCalendar.setGregorianChange( new Date(Long.MIN\_VALUE)).
* Its fields ERA, YEAR, MONTH, DAY\_OF\_MONTH, HOUR\_OF\_DAY, MINUTE, SECOND and MILLISECOND are set using the method Calendar.set(int,int)

**See Also:**[toGregorianCalendar(java.util.TimeZone, java.util.Locale, XMLGregorianCalendar)](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html#toGregorianCalendar(java.util.TimeZone,%20java.util.Locale,%20javax.xml.datatype.XMLGregorianCalendar))

### toGregorianCalendar

public abstract [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) **toGregorianCalendar**([TimeZone](http://docs.google.com/java/util/TimeZone.html) timezone,  
 [Locale](http://docs.google.com/java/util/Locale.html) aLocale,  
 [XMLGregorianCalendar](http://docs.google.com/javax/xml/datatype/XMLGregorianCalendar.html) defaults)

Convert this XMLGregorianCalendar along with provided parameters to a [GregorianCalendar](http://docs.google.com/java/util/GregorianCalendar.html) instance.

Since XML Schema 1.0 date/time datetypes has no concept of timezone ids or daylight savings timezone ids, this conversion operation allows the user to explicitly specify one with timezone parameter.

To compute the return value's TimeZone field,

* when parameter timeZone is non-null, it is the timezone field.
* else when this.getTimezone() != FIELD\_UNDEFINED, create a java.util.TimeZone with a custom timezone id using the this.getTimezone().
* else when defaults.getTimezone() != FIELD\_UNDEFINED, create a java.util.TimeZone with a custom timezone id using defaults.getTimezone().
* else use the GregorianCalendar default timezone value for the host is defined as specified by java.util.TimeZone.getDefault().

To ensure consistency in conversion implementations, the new GregorianCalendar should be instantiated in following manner.

* + Create a new java.util.GregorianCalendar(TimeZone, Locale) with TimeZone set as specified above and the Locale parameter.
  + Initialize all GregorianCalendar fields by calling [Calendar.clear()](http://docs.google.com/java/util/Calendar.html#clear())
  + Obtain a pure Gregorian Calendar by invoking GregorianCalendar.setGregorianChange( new Date(Long.MIN\_VALUE)).
  + Its fields ERA, YEAR, MONTH, DAY\_OF\_MONTH, HOUR\_OF\_DAY, MINUTE, SECOND and MILLISECOND are set using the method Calendar.set(int,int)

**Parameters:**timezone - provide Timezone. null is a legal value.aLocale - provide explicit Locale. Use default GregorianCalendar locale if value is null.defaults - provide default field values to use when corresponding field for this instance is FIELD\_UNDEFINED or null. If defaultsis null or a field within the specified defaults is undefined, just use java.util.GregorianCalendar defaults. **Returns:**a java.util.GregorianCalendar conversion of this instance.

### getTimeZone

public abstract [TimeZone](http://docs.google.com/java/util/TimeZone.html) **getTimeZone**(int defaultZoneoffset)

Returns a java.util.TimeZone for this class.

If timezone field is defined for this instance, returns TimeZone initialized with custom timezone id of zoneoffset. If timezone field is undefined, try the defaultZoneoffset that was passed in. If defaultZoneoffset is FIELD\_UNDEFINED, return default timezone for this host. (Same default as java.util.GregorianCalendar).

**Parameters:**defaultZoneoffset - default zoneoffset if this zoneoffset is [DatatypeConstants.FIELD\_UNDEFINED](http://docs.google.com/javax/xml/datatype/DatatypeConstants.html#FIELD_UNDEFINED). **Returns:**TimeZone for this.

### clone

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

Creates and returns a copy of this object.

**Overrides:**[clone](http://docs.google.com/java/lang/Object.html#clone()) in class [Object](http://docs.google.com/java/lang/Object.html) **Returns:**copy of this Object**See Also:**[Cloneable](http://docs.google.com/java/lang/Cloneable.html)

| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/XMLGregorianCalendar.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/javax/xml/datatype/Duration.html)   NEXT CLASS | [**FRAMES**](http://docs.google.com/index.html?javax/xml/datatype/XMLGregorianCalendar.html)    [**NO FRAMES**](http://docs.google.com/XMLGregorianCalendar.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | FIELD | [CONSTR](#3rdcrjn) | [METHOD](#26in1rg) | DETAIL: FIELD | [CONSTR](#35nkun2) | [METHOD](#44sinio) |

[Submit a bug or feature](http://bugs.sun.com/services/bugreport/index.jsp)

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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