



Getting started with

# **ScroogeXHTML for the Java™ platform**

Version 7.0

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## Introduction

### Features

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ScroogeXHTML for the Java™ platform converts text attributes including background and highlight colors, paragraph attributes including alignment (left, right, centered, justified) and paragraph indent (left, right, first line) and simple numbered or unnumbered lists.

Unicode conversion allows international documents, including simplified and traditional Chinese, Korean and Japanese.

CSS and default font settings allow to create optimized documents.

### Limitations

---

The library supports a limited subset of the RTF standard. If you are unsure about support for a specific conversion feature, please contact us.

Some of the document elements which will not be converted are:

- Tabulators (a tab character will be replaced by a sequence of non breaking spaces)
- Non-alphabetic characters in the "Symbol" font

### Embedded images

---

The library extracts raw data of embedded images. The conversion of raw data from WMF or other not web-ready formats to a web-ready format (e. g., PNG or JPG) requires third-party libraries. Habarisoft can not give recommendations for specific graphic libraries.

### API Documentation

---

The JavaDoc API documentation is located in the installation folder /apidocs.

It is also contained in the ScroogeXHTML-7.0.0-javadoc.jar.

# Installation

## Requirements

---

ScroogeXHTML for the Java™ platform requires

- Java SE 7 or 8<sup>1</sup>
- SLF4J (logging framework)
- JDK 7 for development

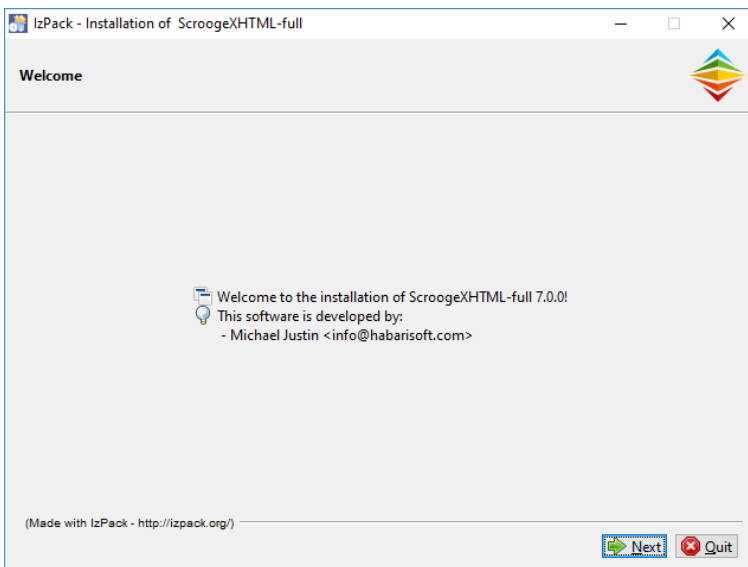
## Installation steps

---

The library installer is an executable JAR<sup>2</sup> file created with izPack<sup>3</sup> and works on Microsoft Windows™, Linux™, Solaris™ and Mac OS X™. A Java Run-time Environment is required to execute it.

To launch the installer, double-click it. The installer will guide you through the installation steps.

The installation begins with a language selection dialog.



Welcome Page

---

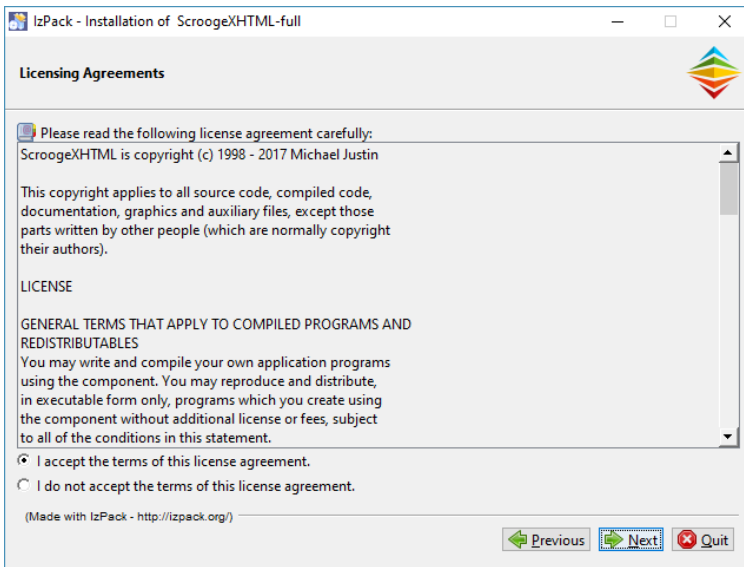
1 The library has not been tested with Java 9

2 <https://docs.oracle.com/javase/7/docs/technotes/guides/jar/jarGuide.html>

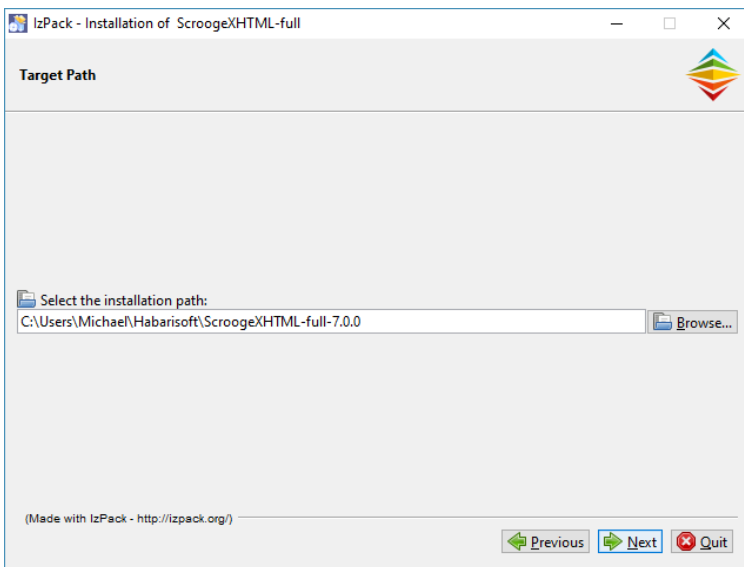
3 <http://izpack.org/>



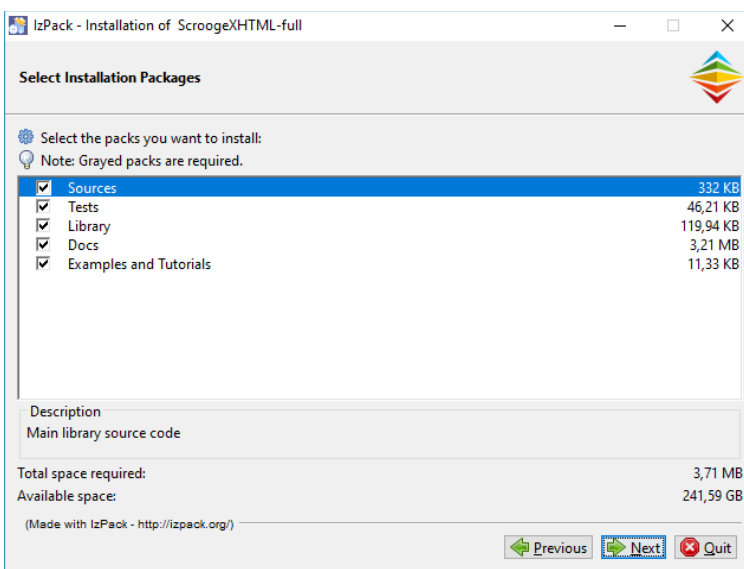
# ScroogeXHTML for the Java™ platform 7.0



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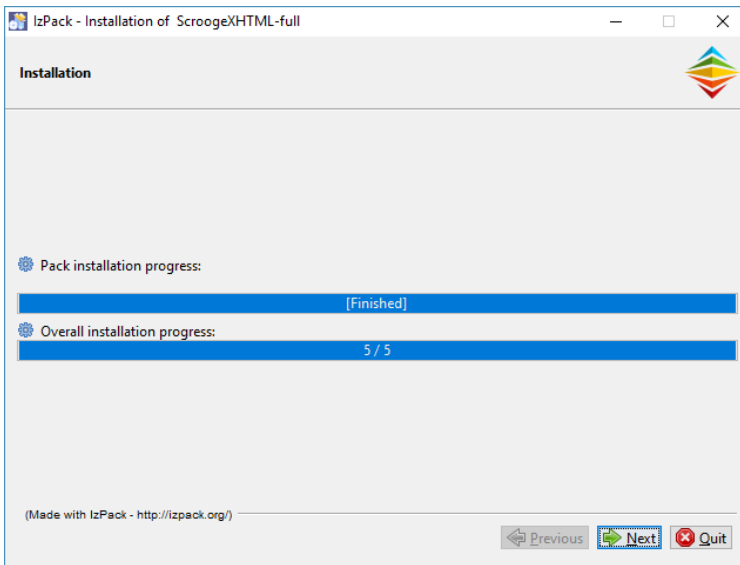


Target Path



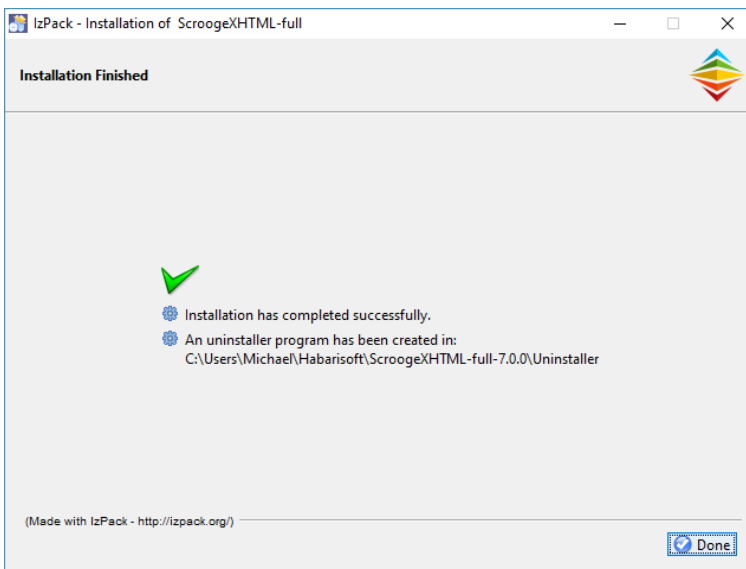
Select Installation Packages

Installation



Installation finished

Depending on your choice, an uninstaller will be installed in a sub-directory of the installation folder.



## Maven dependency

### Maven

```
<dependencies>
  ...
  <dependency>
    <groupId>com.habarisoft</groupId>
    <artifactId>ScroogeXHTML</artifactId>
    <version>7.0.0</version>
  </dependency>
  ...
</dependencies>
```

See also "[IDE integration in Maven projects](#)"

## Gradle dependency

### Gradle

```
dependencies {
    ...
    compile 'com.habarisoft:ScroogeXHTML:7.0.0'
    ...
}
```

## Directory structure

```
<inst>
|- apidocs                               JavaDoc documentation
  |- ...
|- docs                                   This document
  |- ScroogeXHTMLGettingStarted.pdf
|- src
  |- main
    |- java
      |- com
        |- habarisoft
          |- scroogexhtml                 Library source code
  |- test
    |- java
      |- com
        |- habarisoft
          |- scroogexhtml                 Test source code
        |- scroogexhtml
          |- example                       Example code
          |- tutorial                       Tutorial code
|- Uninstaller
  |- uninstaller.jar
license.txt
ScroogeXHTML-7.0.0.jar                    Precompiles library
ScroogeXHTML-7.0.0-javadoc.jar            Compressed JavaDoc
ScroogeXHTML-7.0.0-sources.jar           Compressed source code
```

## Breaking changes in version 7.0

### ConvertFootnotes default value

The default value of the `ConvertFootnotes` property is **false** now to increase the conversion speed.

**Important migration note:** if you need footnote conversion, set `ConvertFootnotes` to **true** as shown below:

#### Code example

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// footnote conversion is switched off by default in ScroogeXHTML 7.0
scrooge.setConvertFootnotes(true);

// run the conversion
...
```

### ConvertHyperlinksForBlueUnderlinedText

The property has been removed as most RTF writers emit hyperlinks encoded as **RTF HYPERLINK** fields.

### Hyperlink post processor

The detection and conversion of hyperlinks based on text attributes is still possible with a post processor. An example solution for the conversion of blue and underlined text to hyperlinks is implemented as a post processor (`ConvertUnderlinedToHyperlinks`).<sup>4</sup>

---

<sup>4</sup> The `ConvertUnderlinedToHyperlinks` class is provided as unsupported example code

**Code example**

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// add the post processor
PostProcessListener l = new ConvertUnderlinedToHyperlinks("#0000ff");
scrooge.getPostProcessListeners().add(l);

// run the conversion
...
```

## MetaDateAuto removed

The property was deprecated and has been removed in this version.

## No default post process listeners

The converter now does not add any post process listeners by default (on creation) to increase the conversion speed anymore.

The execution of post process listeners may take significant time. Adding post process listeners explicitly in client code (when needed) is more transparent than adding default listeners internally in the converter.

**Migration note:** if you upgrade from ScroogeXHTML 6.3.0 or later to 7.0, you may add the default progress listeners with this code:

**Code example**

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// no post processor are registered by default in ScroogeXHTML 7.0

// add default post processors
scrooge.addDefaultListeners();

// run the conversion
...
```

## Progress listener removed

Progress listener methods and properties have been removed to speed up the conversion and to keep the converter library size small.

## UseListTable default value

The default value of `UseListTable` is **false** now, since tests showed that many RTF writers use the list table in incorrect or inconsistent ways, which caused low quality conversion results.

In the new default configuration (list table support switched off), conversion results visually match the original document better.

For the reasons described above, the `UseListTable` property also has been **deprecated** (see below). The new way to enable list table support is shown below:

### Code example

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// list table support is switched off by default in ScroogeXHTML 7.0

// UseListTable is deprecated since 7.0
// scrooge.setUseListTable(true);

// enable RTF list table support when needed:
scrooge.setOutputProperty(ConversionKeys.SUPPORT_LIST_TABLE, "yes");
```

**Migration note:** the document size increases when list table support is turned off.

## Migration from earlier versions

---

If you migrate from version 6.6 or newer to 7.0, and wish to initialize the converter with compatible default property values, you may use this code:

```
ScroogeXHTML scrooge = new ScroogeXHTML();

scrooge.setOutputProperty(CONVERT_PARAGRAPH_BORDERS, "yes");
scrooge.setOutputProperty(SUPPORT_STAR_PN, "yes");
scrooge.setOutputProperty(SUPPORT_LIST_TABLE, "yes");
scrooge.addDefaultListeners();
scrooge.setConvertFootnotes(true);
```

## New in version 7.0

### List conversion

---

#### Activation of list table support

Starting with version 7.0, the property `UseListTable` is deprecated. To enable list table support<sup>5</sup>, set the `OutputProperty` `SUPPORT_LIST_TABLE` to "yes".

##### Code example

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// enable RTF list table support
scrooge.setOutputProperty(ConversionKeys.SUPPORT_LIST_TABLE, "yes");

// run the conversion
...
```

#### Multi-level list support

Multi-level bullet list conversion support is now available when list table support is enabled.

##### Code example

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();
// enable experimental list table support
scrooge.setOutputProperty(ConversionKeys.SUPPORT_LIST_TABLE, "yes");
// enable experimental multi-level support
scrooge.setOutputProperty(ConversionKeys.SUPPORT_MULTILEVEL, "yes");
// run the conversion
...
```

---

<sup>5</sup> List table support is an unsupported experimental feature



## Numbered lists with roman numbers

Numbered lists with roman numbers are now supported when list table support is enabled.

## Experimental feature notice

Important:

- List table support and multi-level list support are experimental features
- If you use them, be aware that not all RTF writers generate correct and consistent list code
- Experimental features may be removed or significantly changed in future releases

## Wingdings bullets

---

The library includes an example post processor which replaces Wingdings bullets with web-safe bullets.

The listener has been designed for usage with RTF generated by WPTools. Other RTF writers might need additional configuration and/or modifications of the listener.

The listener is included with source code<sup>6</sup>.

---

<sup>6</sup> The ReplaceWingdingsBullets class is provided as unsupported example code

**Code example**

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// non-web-safe bullet used by WPTools 7.2
String badBullet = "ÿ";

// web-safe bullet
char bullet = '\u2022';

// add the post processor
PostProcessListener l = new ReplaceWingdingsBullets(bullet, badBullet);
scrooge.getPostProcessListeners().add(l);

// run the conversion
...
```

## Table conversion

---

- table border (whole table border) detection improved
- (since 6.6) table cell background color

## Other improvements

---

### Paragraph alignment conversion

New property ConvertAlignment (default true)

### Paragraph border conversion

Paragraph border conversion is enabled by default. To switch it off, use CONVERT\_PARAGRAPH\_BORDERS.

**Code example**

```
scrooge.setOutputProperty(ConversionKeys.CONVERT_PARAGRAPH_BORDERS, "no");
```

### Improved support for Japanese text

The range of supported symbols for Japanese text is extended.

ScroogeXHTML for the Java™ platform 7.0

## **JDK 8 Javadoc**

Javadoc has been cleaned up to be compatible with the new JDK 8 Doclet.

## **JavaBean manifest entry**

The manifest now includes the JavaBean indicator (JavaBean: true).

## **Performance improvements**

---

- faster ConvertEmptyParagraphs method
- (since 6.7) faster initialization of DOM tree transformation
- (since 6.6) faster RGB value to HTML color conversion
- (since 6.6) faster cell merging algorithm

# Conversion options

## Overview

This table lists available conversion options, their valid values, defaults, and which area of the conversion they affect.

Key	Values	Area
SUPPORT_LIST_TABLE <sup>7</sup>	yes   <b>no</b>	Lists
SUPPORT_STAR_PN <sup>8</sup>	yes   <b>no</b>	Lists
SUPPORT_MULTILEVEL <sup>9</sup>	yes   <b>no</b>	Lists
CONVERT_HEADERS_AND_FOOTERS <sup>10</sup>	yes   <b>no</b>	Text
CONVERT_PARAGRAPH_BORDERS <sup>11</sup>	yes   <b>no</b>	Paragraphs

## SUPPORT\_LIST\_TABLE

This conversion options enables support for the RTF list table (Word 97). The list table is a section in the RTF header which stores styles for numbered and unnumbered lists. The document then refers to a specific style by its id.

This option is experimental because some RTF writers generate malformed list tables. Use with caution.

## SUPPORT\_STAR\_PN

This conversion options enables support for list formatting based on `\*\pn` RTF tokens (Word 6.0/95 RTF). This option is experimental. Use with caution.

<sup>7</sup> Experimental, introduced in version 5.3 (UseListTable property)

<sup>8</sup> Experimental, introduced in 7.0

<sup>9</sup> Experimental, introduced in 7.0

<sup>10</sup> Since 6.3.0

<sup>11</sup> Since 7.0 it is possible to disable paragraph border box conversion (introduced in version 6.5)

## **SUPPORT\_MULTILEVEL**

This conversion options enables support for multilevel numbered and unnumbered lists in conjunction with SUPPORT\_LIST\_TABLE (Word 97).

This option is experimental because some RTF writers generate malformed list tables. Use with caution.

### **Code example**

```
// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// enable experimental list table support
scrooge.setOutputProperty(ConversionKeys.SUPPORT_LIST_TABLE, "yes");

// enable experimental multi-level support
scrooge.setOutputProperty(ConversionKeys.SUPPORT_MULTILEVEL, "yes");

// run the conversion
```

## **CONVERT\_HEADERS\_AND\_FOOTERS**

This conversion options enables support for header and footer text conversion. By default header and footer will not appear in the output document.

This option is experimental. Use with caution.

## **CONVERT\_PARAGRAPH\_BORDERS**

This conversion options enables support for paragraphs which are formatted with a simple border box.

This option is experimental. Use with caution.

# Tutorial 1: simple conversion

## What it does

---

This example converts a hard-coded RTF document to a HTML5 document named 'tutorial-1.html' in the current directory.

It sets the `AddOuterHTML` property which causes generation of surrounding HTML head and body code. The converted HTML is inserted within the body of the document.

## Java code

### Code example

```
public class Tutorial1 {  
    public static final void main(String[] args) throws IOException {  
        String rtf = "{\\rtf1 {\\b bold \\i Bold Italic \\i0 Bold  
again} \\par}";  
  
        // create a converter instance  
        ScroogeXHTML scrooge = new ScroogeXHTML();  
  
        // configure conversion options  
        scrooge.setAddOuterHTML(true);  
  
        // convert RTF and write HTML to file  
        scrooge.convert(rtf, new File("tutorial-1.html"));  
    }  
}
```

Compile and run this class, and open the result document in a web browser or a text editor.

## Result HTML

### HTML

```
<!DOCTYPE html>
<html>
  <head>
    <META http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Untitled document</title>
    <meta content="ScroogeXHTML for the Java(tm) platform 7.0.0"
name="generator">
  </head>
  <body>
    <p>
      <span style="font-weight:bold;">bold </span><span style="font-
weight:bold;font-style:italic;">Bold Italic </span><span style="font-
weight:bold;">Bold again</span>
    </p>
  </body>
</html>
```

## Tutorial 2: additional HTML code

### What it does

---

This example converts a hard-coded RTF document to a HTML5 document named 'tutorial-2.html' in the current directory.

It shows how a HTML fragment generated by the converter can be embedded in other HTML code and then saved to a file.



## Java code

### Code example

```

public class Tutorial2 {

    public static final void main(String[] args) throws IOException {

        String rtf = "{\\rtf1 Hello {\\b World} from ScroogeXHTML \\par}";

        // create a converter instance
        ScroogeXHTML scrooge = new ScroogeXHTML();

        // convert RTF and store HTML in String variable
        String converted = scrooge.convert(rtf);

        // wrap with required HTML5 elements
        String html = "<!DOCTYPE html>\n"
            + "<html>\n"
            + "  <head>\n"
            + "    <title>\n"
            + "      Untitled document\n"
            + "    </title>\n"
            + "    <meta http-equiv=\"content-type\"
content=\"text/html; charset=UTF-8\">\n"
            + "  </head>\n"
            + "  <body>\n"
            + "    <p>additional paragraph before</p>\n"
            + converted
            + "    <p>additional paragraph after</p>\n"
            + "  </body>\n"
            + "</html>";

        try {
            writeHtmlFile(html);
        } catch (IOException ex) {
            Logger.getLogger(Tutorial2.class.getName()).log(Level.SEVERE,
null, ex);
        }
    }

    private static void writeHtmlFile(String html) throws IOException {
        OutputStream os = new FileOutputStream(new File("tutorial-
2.html"));
        Writer writer = new OutputStreamWriter(os,
StandardCharsets.UTF_8);
        try (BufferedWriter outWriter = new BufferedWriter(writer
)) {
            outWriter.write(html);
        }
    }
}

```

Compile and run this class, and open the result document in a web browser or a text editor.

## Result HTML

### HTML

```
<!DOCTYPE html>
<html>
  <head>
    <title>
      Untitled document
    </title>
    <meta http-equiv="content-type" content="text/html; charset=UTF-8">
  </head>
  <body>
    <p>additional paragraph before</p>
    <p>Hello <span style="font-weight:bold;">World</span> from ScroogeXHTML
  </p>
    <p>additional paragraph after</p>
  </body>
</html>
```

## Tutorial 3: fix missing http:// in hyperlinks

Tutorial 3 converts a RTF documents which contains a simple (blue and underlined formatted) hyperlink.

The hyperlink text does not begin with a valid protocol name such as `http://` and this causes a non functional hyperlink in the result HTML:

HTML

```
<p>
  <a href="example.com">example.com</a>
</p>
```

To fix this, we want to apply post processing code which modifies all `<a>` elements so that they begin with `http://`

The result should be:

HTML

```
<p>
  <a href="http://example.com">example.com</a>
</p>
```

Our solution will use the XPath expression `//a[not(contains(@href, '://'))]` to find all `<a>` elements in the document whose `href` attribute do not contain the character sequence `://"`.

For all found elements, our code then inserts `"http://"` in the value of the `href` attribute.

Notes

- this is pure demonstration code
- there is no guarantee that the result `href` value will be a valid internet address

### Source code

The following source code example shows the `PostProcessListener` implementation and its `postProcess` method. The full source code can be found in the `tutorial` package of the library.

## Code example

```

// create a converter instance
ScroogeXHTML scrooge = new ScroogeXHTML();

// we want simple HTML output for this example
scrooge.setConvertFontSize(false);
scrooge.setConvertFontName(false);

// enable hyperlink conversion
scrooge.setConvertHyperlinks(true);

// add post process listener
scrooge.getPostProcessListeners().add(new PostProcessListener() {
    @Override
    public void postProcess(PostProcessEventObject e) {
        try {
            XPathFactory xpathFactory =
XPathFactory.newInstance();
            // XPath to find hyperlink nodes.
            XPathExpression xpathExp =
xpathFactory.newXPath().compile(
                "//*[not(contains(@href, '://'))]");
            NodeList links = (NodeList)
xpathExp.evaluate(e.getDocument(), XPathConstants.NODESET);
            for (int i = 0; i < links.getLength(); i++) {
                Element a = (Element) links.item(i);
                String href = a.getAttribute("href");
                a.setAttribute("href", "http://" + href);
            }
        } catch (XPathExpressionException ex) {
            Logger.getLogger(Tutorial3.class.getName()).log(Level.SEVERE, null, ex);
        }
    }
});

// convert RTF to HTML
scrooge.setAddOuterHTML(true);
scrooge.convert(rtf, new File("tutorial-3.html"));

```

## Embedding HTML

### Usage of AddOuterHTML

---

If you convert RTF using the methods

- `void convert(String rtf)`
- `void convert(String rtf, Charset charset)`
- `String convert(final ByteArrayInputStream rtf)`

the converter by default returns only the content of the document **body element**, without enclosing it in `<html>...<body>...</body></html>` tags. This fragment can be used in a larger document.

The property `AddOuterHTML` controls whether the enclosing HTML will be generated by the converter. Use `setAddOuterHTML(true)` to switch it on.

For conversions to files, the `AddOuterHTML` property must always be set to `true`. If the property is `false`, the converter will throw a `UnsupportedOperationException`.

### Character encoding and document type

Choosing the correct charset<sup>12</sup> and document type (HTML5 or XHTML) for the result document is also important.

Always specify the result document charset whenever you save the HTML to a file, or write it to a HTTP response, to avoid encoding problems on the receiver side.

---

<sup>12</sup> <https://docs.oracle.com/javase/7/docs/api/java/nio/charset/Charset.html>

# Hypertext support

## Overview

---

### Hyperlink field detection

Many RTF documents use specific hidden fields to store the Hyperlink target and the corresponding display text.

To enable hyperlink conversion of these RTF hyperlink fields, in addition to `setConvertHyperlinks(true)` also **use** `setConvertFields(true)`.

If a hidden field does not specify a hyperlink, the converter will only insert the display text (the 'result value' of the hidden field) in the output document.

## Table conversion

### Overview

---

ScroogeXHTML for the Java™ platform supports conversion of simple RTF tables to HTML. The converter does not convert tables by default. Any tables in the RTF input document will be converted to text paragraphs.

Table conversion is activated with `setConvertTables(true)`.

Because RTF document writers can create highly complex RTF table code, conversion results may not be perfect.

# Size Optimization

## Default Font Properties

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Document size can be optimized with the usage of CSS for frequently used font properties which can be set using the `DefaultFontSize`, `DefaultFontName` and `DefaultFontColor` properties.

Setting the `IncludeDefaultFontStyle` property to true then has these effects:

- if `AddOuterHTML` is true, the HTML head section will contain a CSS definition for the default font style
- the converter will create font style attributes only for text parts which differ from the values of the `DefaultFontSize`, `DefaultFontName` and `DefaultFontColor` properties

## Example

If most text in the document uses "Arial, 14 pt, black", set the `DefaultFontSize`, `DefaultFontName` and `DefaultFontColor` properties to these values, and set `IncludeDefaultFontStyle` to true.

If the document is converted with `AddOuterHTML` to true, the HTML head section will contain the following CSS definition:

### Code example

```
<style type="text/css">
  <!-- BODY
  {font-family:Arial,sans-serif;font-size:14pt;color:#000000; }
  -->
</style>
```



## Picture Extraction

### PictureAdapter Interface

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Picture extraction is activated by assigning a `PictureAdapter` implementation and `setConvertPictures(true)`.

The library includes basic implementations of the `PictureAdapter` interface.

### MemoryPictureAdapter

`MemoryPictureAdapter` keeps all extracted picture data in memory and returns hyperlinks to HTTP picture resources, which are then inserted in the result document.

This implementation is useful for web server environments where the server returns the image data back to the client. In the most simple implementation, the server keeps the image data in memory for the duration of a client session, and returns the image data dynamically when the browser requests the image resource URLs. Of course this requires HTTP session management and sufficient memory.

#### Example for a link element:

##### Code example

```

```

The image URLs will be numbered automatically.

The class allows to set a base path with `setBase(String base)`, for example `scrooge.setBase("/images/")`, so that the result URL will be `"/images/image1.png"`.

### MemoryPictureAdapterBase64

`MemoryPictureAdapterBase64` extends `MemoryPictureAdapter` but returns Image Data URIs for pictures which do not exceed a given maximum size. For larger images, it will return the external image URL as defined by its super class.

By default, the size threshold is set to 32 kB. The threshold can be set with the `maxSize` constructor argument.

Data URIs are fully supported by most major browsers, and partially supported in Internet Explorer and Microsoft Edge.

## Code example

```
scrooge = new ScroogeXHTML();  
scrooge.setConvertPictures(true);  
PictureAdapter adapter = new MemoryPictureAdapterBase64();  
scrooge.setPictureAdapter(adapter);  
  
// run the conversion  
...
```

**Example for a Data URI link:**

## Code example

```
` elements. Example:

RTF view

```
Line 1  
Line 2  
  
Line 3
```

will look different in the HTML browser

Browser view

```
Line 1  
Line 2  
Line 3
```

You can set the `ConvertEmptyParagraphs` property to true. The result HTML then will contain `<br>` or `<br />` instead of empty `<p>` elements, and look as expected.

### How can I remove the space between lines?

HTML browsers use default paragraph styles, which will render paragraphs in RTF documents with a bigger space between lines than RTF editors. For example a RTF document which appears like this

RTF view

```
Line 1  
Line 2  
Line 3
```

will look different in the converted HTML document

#### Browser view

```
Line 1  
Line 2  
Line 3
```

### Solution:

To remove empty space between lines, define a CSS style for the paragraph element, which sets the margins to 0:

#### CSS

```
p { margin-bottom:0px;margin-top:0px; }
```

## Installation

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### IDE integration in Maven projects

#### For NetBeans IDE:

1. In Maven project open "Add dependency" dialog
2. Make up some groupId, artifactId and version and fill them, OK
3. Dependency will be added to the pom.xml and will appear under "Libraries" node of maven project
4. Right-click Lib node and "manually install artifact", fill the path to the jar

The Jar should be installed to local Maven repository with coordinates entered in step 2

#### For Maven (command line):

<http://maven.apache.org/guides/mini/guide-3rd-party-jars-local.html>

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