

# JMenuMaker 1.0

## manual 0.1

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## 0. About

JMenuMaker is a free (free as in freedom) library for Java™ which always you to build flexible, full scale, menus for Swing windows, in an easy, fast and clean way with minimal amount of Java code. All with any help from a visual editor.

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# 1. Basic structure

## 1.1. Basic API structure

All classes in JMenuMaker are located in the package `se.kth.maandree.jmenumaker`. The package consists of 6 classes: JMenuMaker, JMenuSpacers, JMenuTag, JWeakSeparator, UpdateListener and Menp.

JMenuMaker comes with two public auxiliary static methods: `errprint(String)` and `errprintln(String)`. They implement the exact functionality of `System.out.print(String)` and `System.out.println(String)`, respectively, except that they in the current version filters ANSI escape sequences. They will however in the (probably) next release only filter ANSI escape sequences the user's terminal emulator does not support. These methods are used by the library for printing rendering information.

`HashMap<String, WeakReference<Component>> makeMenu(Container, String, UpdateListener, Menp)` in JMenuMaker is the method which builds the menus. It takes four arguments: the Swing window to decorate with the menu, the file containing the menu markup, the event listener and optional (skipped with `null`) instance of a Menp program (**experimental**). The method returns a hash map with the menu items' ID as keys with weak references to the menu items.

## 1.2. Configuration files

### 1.2.1. Basics of the menu markup

JMenuMaker's menu markup language, JMML, is designed to be simple, clean and confusion free. The unreleased predecessor used XML, the disadvantage with XML is that it more code is needed, making it unclear, there may be confusion with entities and groups must either begin and end in the same node of the menu tree or be named. Using SGML would however solve the grouping issue since tags may overlap each other in SGML, and GML would just be messy. JMML's syntax is designed to minimise the amount of code, maximise the clarity and be confusion free.

In JMML tabspace is handled as blankspace, and `\f`, `\r\n`, `\r` and `\n` are recognised as new breakings. **All other whitespace must be left out of the code in the current version of JMenuMaker.** A line, that does not contain a file inclusion or comment can be continue by appending with a backslash (`\`). The current version of JMML does only support UTF-8.

A comment is started by a pound character (`#`) outside a string and outside a file inclusion. The comment ends at the end of the line. The pound character must be the first character in the token, i.e. it must be the first character in the line or be preceded by a whitespace.

A file can be included by an at sign (`@`), file inclusion follows the same syntax rules as comments. **In the current version of JMenuMaker, recursive and mutually recursive inclusion is not checked, and will therefore cause the thread to freeze, and eventually cause the program or computer to run out of memory.**

A string is both started and ended by a double quote character (`"`), a double quote character inside a string is created by two double quote characters (i.e. by closing and opening a string.) **In the current version of JMML, string does not allow escaping, other than double backslash for one backslash [implemented for forward capability].**

JMML supports rich strings and bang strings. A rich string is a HTML syntax string, which supports bold, italic text &a. Rich strings actually only prepends the string with `<html>` and appends the string with `</html>`, making Swing parse it as HTML. Rich strings are created by prepending the string with a dollar sign (\$). **I the current version of JMenuMaker, a string must not be both rich and a bang string.** Bang strings are created by prepending the string with a bang [exclamation sign] (!), they will underline the banged character in the string and mnemonic it. **The current version of JMML the exclamation signs (!) cannot be escaped in bang strings.**

JMenuMaker is verbose and prints information to stderr, this can be turned off in the source code, but you can also turn it off for a file by adding the token `&quite!` when you want it not to be verbose, and adding the token `&verbose!` when you want it to be verbose. JMenuMaker ignores unrecognised tokens, so if you fork JMenuMaker you are recommended to make your own interpretation directive tokens using this syntax (starting with an ampersand [&]), forks of JMenuMaker are recommended to always ignore or only warn on unrecognised tokens string with ampersand (&).

JMML consists of two stacks, one container stack and one group stack. The group stack is pushed using the opening curly bracket character (`{`) and is popped using the closing curly bracket character (`}`); when pushing it a new button group is created, of all selectable items [such as check boxes and radio buttons] inside a group only one can be selected at any time. When click on one it is selected and the others are unselected. To temporarily disabling grouping a null group can be pushed by using the opening curly bracket character followed by a tilde (`{~`). It is popped in the same way as non-null groups. Because of this token, the closing curly bracket character (`}`) token has a synonym token, a tilde followed by the closing curly bracket character (`~}`).

The container stack puts items, such as menu items inside each other, it's essential for creating menus. An item is pushed into the container stack by adding the push token on the same line as the item is defined. The push token is the greater than sign (`>`). The stack is popped by the token consisting of a less than sign (`<`). `<` and `>` not actually brackets (nor quotes), but often handled as opening and closing brackets, respectively, in text editors. Text editors supporting JMML and bracket match should handle `>` and `<` as opening and closing brackets, respectively, i.e. reverse to the regular matching.

Menu items are created by adding their caption as a string token. Menus can contain separators, they are created by a double dash token (`--`) [two regular hyphens]. These separators are hard (or strong) and will always be visible, if not explicitly set as hidden. There are also weak (or shy) separators, created by a single dash token (`-`) [one regular hyphen], they are only visible when needed, that is, when it is the lone visible item, the first visible or last visible item, in a menu, and is not preceded nor followed by a visible separator. To update the visibility of the weak separators your program must invoke `se.kth.maandree.jmenumaker.JWeakSeparator.update(JMenuBar)` with your menu bar instance as the only parameter.

JMML also support dynamic spacers, **the current version does not support fixed spacers.** A dynamic spacer is added in the topmost level, is transparent and will take most space as possible. This can be used, for example, to put menus on the left side and the right side on a menu bar. These are created by the token consisting of one blank space inside [round] brackets [`( )`].

Another nice feature in JMML is the support for other component classes than menus, **however the current version does only support predefined classes and predefined attributes, and only one predefined class.** Instances of predefined classes are created by the token `!class` where `class` is the class of the instance to create. The **only** predefined class in the current version is `slider`, which creates a `JSlider`.

The final feature are menu tags, these are used to let your program add its own menus (perhaps you want to add same bookmarks). To create a tag, add the token (*name*) where *name* is the name of the tag. Be aware the the tag names are program instance unique. For example if you want to create bookmarks you can add the tag (*bookmarks*) and then invoke `setItems(Component...)`, from your tag instance which is retrieved by invoking `se.kth.maandree.jmenumaker.JMenuTag.getInstance(String)` with the tag name as the only parameter, to set the items the tag contains. You may want to update the visibility of your weak separators after setting items in your tags. If modifying the visibility of items in a tag you should invoke `update()` from the tag instance.

Menu tags have two more features, empty indicators and alive indicators. An empty indicator is the menu item this should be visible if no item inside a tag is visible. An empty indicator can be inside the tag, you are however discouraged to add indicators from your source code, which is the only way to add an empty indicator outside its tag. The empty indicator is a normal menu item, you can however make it any class, by setting it yourself from the source code. If the empty indicator is defined from the menu markup file it is automatically set to disabled if it is not explicitly set to enabled using the attribute token *enabled*. To add an empty indicator in a tag with the name *name*, modify the tag token (*name*) to (*name ? string*) where *string* is the caption [a string] of the empty indicator. Note that attributes are defined outside the brackets, and not inside. To add an alive indicator modify the tag token to (*string ? name*) instead. Alive indicators are visible when the tag contains visible items. Alive tokens are not automatically disabled, and must be placed outside, and should contain a tag (*name*) which has the same *name*; the menu tag is defined by (*name*) and the alive indicator is defined by a separate line when the token (*string ? name*) as opposed to with empty indicators that are defined by the same token [the same line (items are always defined on the same line)].

Items can be disabled with the token *disabled* and hidden by the token *hidden*. Items can also have a unique ID, defined by a token *id=str* where *str* is a string and must therefore be surrounded by a double quote character ("). Note that this is not the case with menu tags, otherwise the empty and alive indicators should have needed another syntax. Items which have an ID is included in the returned hash map. Items can also, but not at the same time, have a unique not-ID, these are created by prepending the ID token with a tilde, in the returned hash, the ID is the defined ID with a prepending NUL character (\0). Only menu items [items not created with (!class)] can have a not-ID. Actions on items with an ID will be reported to the `UpdateListener`, if a the ID is a not-ID the ID will be the not-ID (does not include the NUL character) and the value will be inverted. Items with an ID can also have an *invoke=method* attribute which will invoke method *method* in the `Menp` instance with the ID as the only parameter.

## 1.2.2. Basics of the Menp language

`Menp`'s (MENu Processing) syntax is inspired by Lisp (LIST Processing). The advantage of the syntax is that it is very easy to parse.

In `Menp` code you define methods, the method *main* runs when the menu has been built, and any method can be invoked from your source code, your `Menp` code and by a menu defined in your menu markup file. Methods are defined at the topmost level in the code, by the method name followed by a colon (:) and its instructions inside a pair of [round] brackets.

`Menp` ignores whitespace (only blankspace, tabspace and recognised line breakings in the current version) outside strings, except for in include URLs [tabspace is handled as one blankspace] and the new line that ends a comment or include URL. `\f`, `\r` and `\n` are the recognised new line characters. A comment is started by a pound character (#) outside a string and outside a file inclusion. In the current version of `Menp` only UTF-8 is supported.

A string is both started and ended by a double quote character ("). a double quote character inside a string is created by two double quote characters (i.e. by closing and opening a string.) **In the current version of Menp, string does not allow escaping, other then double backslash for one backslash [implemented for forward capability].**

A file can be included by an at sign (@) outside a string and outside a comment. **In the current version of Menp, recursive and mutually recursive inclusion is not checked, and will there for cause the thread to freeze, and eventually cause the program or computer to run out of memory.**

An instructions is started by an opening [round] bracket, and ended with its matching closing bracket. A block instruction is created this way and include a series of bracketed instructions, optionally with an non-bracketed instructions. An instruction consists of an instruction code followed by a semicolon (;) delimited list of input.

The available instruction codes are:

>	method call	> method ; input...
<	return	
~	undeclare variable	
.	expand nested lists	
*	not	
=	equal?	= left comparand ; right comparand...
	or / union	
&	and / intersection	
^	parity	
,	if	, condition ; if true ; if false
:	assign	: variable ; value
!	set	! attribute[=value] ; items...
?	query any	? attribute[=value] ; items...
??	query all	?? attribute[=value] ; items...
???	query parity	??? attribute[=value] ; items...

Instruction parameters can be of five types: return from instruction, method parameters, variables, strings and booleans. It is possible to as parameter invoke an instruction and take its return by surrounding the instruction with [round] brackets. Variables are declared by the : instructions, to use an assigned variable, prepend the variable name with a percent sign (%). To use a parameter from the method prepend the parameter's 0-based index with a dollar sign (\$), use double dollar signed (\$\$) for all parameters. Strings are surrounded by double quote signs ("), a string represents the ID for a menu item, setting or querying a string will set or query the menu item with that ID. Finally whether are booleans, *true* and *1* represents the boolean value true, while everything else represents false.

## 2. The menu markup language

You should begin by reading “Basics of the menu markup”.

### 2.1. Other classes

#### 2.1.1. (!slider)

The token *(!slider)* creates a `JSlider`, by default it is horizontal, but by adding the attribute *vertical* you can make it vertical, this is the only immutable attribute this class have. See chapter 2.2. for attribute mutation.

Sliders with ID returns there new value when modified. To set the initial value add the attribute *value=val* where *val* is an integer and is the initial value. The same thing can be done to the minimum value, maximum value and extent with the attributes *min=val*, *max=val* and *extent=val*, respectively.  
Attribute mutation

### 2.2. Attribute mutation

In the current version if JMML only other classes [not regular menu items] can have there attributes mutated, however using Menp, the enabled status, visibility, selected status and accelerator can be mutate.

Button items, such as regular menu items can mutate attributes on items which clicked. This is done by adding the attributes *setAttribute=attributes*, *setValue=values* and *targetId=ids*. *attributes* is a semi-colon (;) delimited list of attributes name to mutate, *values* is a semi-colon (;) delimited list new values, and *ids* is a semi-colon (;) delimited list of the target items' ids', where a tilde (~) prepend an ID string to make it the not-ID. Integer values can be appended by +, -, or -- (plus sign, hyphen sign and two hyphen signs, respectively), + will increase the current value, - will decrease the current value and -- will set the value the the specified value minus the current value. Other wise the new value will be the specified.

### 2.3. Menu item attributes

All menu items must be created with a caption (the string token), if you do not want one you will still need to add an empty string.

To add a check box to a menu item add the attribute *type=check* (not selected), or *type=CHECK* (selected). It is standard not to put check boxes in groups. If want the menu item to be selectable and grouped you should use radio buttons. This is used done by adding the attribute *type=radio* (not selected) or *type=RADIO* (selected).

Abstract buttons, including menu items can be roll-overable, have a mnemonic, an accelerator or an icon. To enabled roll over add the attribute *rolloverable=true* or *rolloverable*, to disable roll-over add the attribute *rolloverable=false*. In a future release surrounding one of this attributes with and ampersand (&) (left side) and an exclamation point (!) (right side) will apply this attributes on all following lines, including the line it is added on.

Mnemonic is automatically set with bang strings, but it is also possible to set it manually. Add the attribute *mnemonic=⌘*, where ⌘ is the character (not index) to mnemonic. If the character is not a (a-z|A-Z|0-9) it is possible to use ⌘ in `VK_⌘` where `VK_⌘` is defined in `java.awt.event.KeyEvent`.

An accelerator, **can in the current version of JMML only be simple, meaning it can not be combination of sequential input**; it can be set using the *accelerator=*⌘ attribute, where ⌘ follows the same rules as with *mnemonic=*⌘, but can also be prepended by a set of modifiers. The modifiers are encapsulated in < (left side) and > (right side). The recognised modifiers are:

<i>a</i>	<i>alt</i>	<i>alternative</i>		
<i>g</i>	<i>altgr</i>	<i>altgraph</i>	<i>graph</i>	
<i>s</i>	<i>sft</i>	<i>shf</i>	<i>shft</i>	<i>shift</i>
<i>m</i>	<i>mt</i>	<i>meta</i>		
<i>c</i>	<i>ctr</i>	<i>ctrl</i>	<i>cntrl</i>	<i>control</i>
<i>r</i>	<i>rls</i>	<i>release</i>		

The ones written on the same line, above, are synonyms, and hyphens (-) and underscores (\_) can be added arbitrarily.

An icon is set using the attribute *icon=*⌘, where ⌘ is a string of the file name of the icon, meaning that it is surrounded by double quote characters ("). The path is relative to the working directory, to the markup file. It is also possible to add state conditioned icons. To set the icon displayed when the menu item (or button) is disabled use *icon@disabled=*⌘, *icon@pressed=*⌘ for when pressed, *icon@selected=*⌘ for when selected and *icon@rollover=*⌘ for when rolled over. It is also possible to add an icon for when the menu item (or button) is both disabled and selected by using either *icon@disabled&selected=*⌘ or *icon@selected&disabled=*⌘, to add an icon for when the menu item (or button) is both rolled over and selected use either *icon@rollover&selected=*⌘ or *icon@selected&rollover=*⌘.

Specifying an empty string will cause the icon loader to return null as the loaded icon, effectively removing the icon from the specified state. Note however the state conditioned icons fall back to the lower conditioned, including the standard icon (lowest) when no valid icon is specified; if you want to not have any icon at a specific state, you must specify in fully transparent icon.

## 3. Usage examples

### 3.1. *Hello World*

The simplest way to use JMenuMaker is to let it load a JMML file to your window, without logic. An example of the Java code for this is

```
import se.kth.maandree.jmenumaker.*;

import javax.swing.*;
import java.awt.*;

public class HelloWorld extends javax.swing.JFrame
{
    public static void main(final String... args) throws Exception
    {
        (new HelloWorld()).setVisible(true);
    }

    HelloWorld() throws Exception
    {
        super("HelloWorld.java");
        this.setDefaultCloseOperation(WindowConstants.DISPOSE_ON_CLOSE);
        this.setSize(new Dimension(300, 200));

        JMenuMaker.makeMenu(this, "HelloWorld.jmml", null, null);
    }
}
```

with the JMML code:

```
"Greetings" >
  "Hello World"
<
```

### 3.2. Interactive Hello World

By implementing the libraries `UpdateListener` interface we can see when a menu item is clicked. The code for this is

```
import se.kth.maandree.jmenuaker.*;

import javax.swing.*;
import java.awt.*;

public class InteractiveHelloWorld extends JFrame
    implements UpdateListener
{
    public static void main(final String... args) throws Exception
    {
        (new InteractiveHelloWorld()).setVisible(true);
    }

    InteractiveHelloWorld() throws Exception
    {
        super("InteractiveHelloWorld.java");
        this.setDefaultCloseOperation(WindowConstants.DISPOSE_ON_CLOSE);
        this.setSize(new Dimension(300, 200));

        JMenuMaker.makeMenu(this, "InteractiveHelloWorld.jmml", this, null);
    }

    public void itemClicked(final String id)
    {
        System.out.println(id);
    }

    public void valueUpdated(final String id, final String value) {}
    public void valueUpdated(final String id, final double value) {}
    public void valueUpdated(final String id, final long value) {}
    public void valueUpdated(final String id, final int value) {}
    public void valueUpdated(final String id, final boolean value) {}
}
```

with the JMML code:

```
"Greetings" >
  "Hello World"    id="HelloWorld"
<
```

*HelloWorld* will now be printed to stdout every time the menu labelled *Hello World* is clicked. The methods (overloaded) `valueUpdated` are used for booleanic, numeric and textual items. Sliders are numeric and check box and radio button items (e.g. menus) are booleanic.

## 4. Release history

**1.0    2011-(12)dec-24   16:00            Merry Christmas!**

First release

Contributors:

Mattias Andrée

Founder

## 5. Future releases

Red text in this document marks known issues.

JMML/JMenuMaker will make menus tear off-able, this is however not yet supported by Java, but the methods exists (but are not implemented). If you know you will not want your menus to be tear off-able, add the attribute *untearable* to your container stack pushing menu items, or *&notear!* before the menu items are defined. *untearable* will disable the tear off, *tearable* will explicitly enable tear off, *&notear!* will disable tear off on all following items, and *&tears!* will re-enable tear off on all following items.

Other planned features:

Colouring without rich strings / HTML

Opacity

More attributes for sliders

Error on duplicate attributes

Error on competing attributes

If you make any non-ad-hoc edits to the source code or wish for any additional feature in JMenuMaker, feel free to e-mail me at *maandree@kth.se*. Credit is earned where credit is due.

# Appendix

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