

# ODE Framework

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## Chapter 5

# Namespace Documentation

### 5.1 Package age

#### Packages

- package [clock](#)
- package [event](#)
- package [gui](#)
- package [log](#)
- package [port](#)
- package [task](#)

#### Classes

- class [AGEException](#)
- class [Client](#)
- class [Util](#)

### 5.2 Package age.clock

#### Classes

- class [Alarm](#)
- class [Clock](#)
- interface [Task](#)

### 5.3 Package age.event

#### Classes

- enum [Button](#)
- class [Event](#)
- class [Events](#)
- interface [Handler](#)
- enum [Key](#)
- enum [Type](#)

## 5.4 Package age.gui

### Classes

- class [Dock](#)
- enum [Flag](#)
- class [Handling](#)
- class [Multiline](#)
- class [Rendering](#)
- class [VScroller](#)
- class [Widget](#)
- class [Widgets](#)
- class [Window](#)

## 5.5 Package age.log

### Classes

- enum [Level](#)
- class [Log](#)

## 5.6 Package age.port

### Packages

- package [jogl](#)

### Classes

- interface [Graphics](#)
- interface [Port](#)
- interface [Renderable](#)

## 5.7 Package age.port.jogl

### Classes

- class [JOGLEventListener](#)
- class [JOGLGraphics](#)
- class [JOGLPort](#)
- class [JOGLRenderListener](#)

## 5.8 Package age.task

### Classes

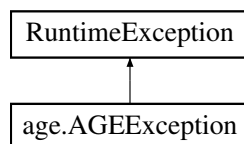
- interface [Task](#)
- class [Tasks](#)

## Chapter 6

# Class Documentation

### 6.1 age.AGEEException Class Reference

Inheritance diagram for age.AGEEException:



#### Public Member Functions

- [AGEEException](#) ()
- [AGEEException](#) (Throwable cause)
- [AGEEException](#) (String message)
- [AGEEException](#) (String message, Throwable cause)

#### Static Private Attributes

- static final long [serialVersionUID](#) = 1L

### 6.1.1 Constructor & Destructor Documentation

#### 6.1.1.1 [AGEEException\(\)](#) [1/4]

```
age.AGEEException.AGEEException ( )
```

#### 6.1.1.2 [AGEEException\(\)](#) [2/4]

```
age.AGEEException.AGEEException (
    Throwable cause )
```

### 6.1.1.3 AGEException() [3/4]

```
age.AGEException.AGEException (
    String message )
```

### 6.1.1.4 AGEException() [4/4]

```
age.AGEException.AGEException (
    String message,
    Throwable cause )
```

## 6.1.2 Member Data Documentation

### 6.1.2.1 serialVersionUID

```
final long age.AGEException.serialVersionUID = 1L [static], [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/[AGEException.java](#)

## 6.2 age.clock.Alarm Class Reference

### Public Member Functions

- void [init](#) (long nanotime)
- void [update](#) (long nanotime)

### Package Functions

- [Alarm](#) (long [nanoperiod](#), [Task](#) task)

### Private Member Functions

- void [trigger](#) (int count, float dT)

### Private Attributes

- long [nanoperiod](#)
- [Task](#) task
- long [mark](#)

## 6.2.1 Constructor & Destructor Documentation

### 6.2.1.1 Alarm()

```
age.clock.Alarm.Alarm (
    long nanoperiod,
    Task task ) [package]
```

## 6.2.2 Member Function Documentation

### 6.2.2.1 init()

```
void age.clock.Alarm.init (
    long nanotime )
```

### 6.2.2.2 trigger()

```
void age.clock.Alarm.trigger (
    int count,
    float dT ) [private]
```

### 6.2.2.3 update()

```
void age.clock.Alarm.update (
    long nanotime )
```

## 6.2.3 Member Data Documentation

### 6.2.3.1 mark

```
long age.clock.Alarm.mark [private]
```

### 6.2.3.2 nanoperiod

```
long age.clock.Alarm.nanoperiod [private]
```

### 6.2.3.3 task

```
Task age.clock.Alarm.task [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/clock/Alarm.java](#)

## 6.3 age.event.Button Enum Reference

### Public Attributes

- [NONE](#)
- [BTN1](#)
- [BTN2](#)
- [BTN3](#)
- [BTN4](#)
- [BTN5](#)
- [BTN6](#)
- [BTN7](#)
- [BTN8](#)

### 6.3.1 Member Data Documentation

#### 6.3.1.1 BTN1

`age.event.Button.BTN1`

#### 6.3.1.2 BTN2

`age.event.Button.BTN2`

#### 6.3.1.3 BTN3

`age.event.Button.BTN3`

#### 6.3.1.4 BTN4

`age.event.Button.BTN4`

#### 6.3.1.5 BTN5

`age.event.Button.BTN5`

#### 6.3.1.6 BTN6

`age.event.Button.BTN6`

#### 6.3.1.7 BTN7

`age.event.Button.BTN7`



### 6.3.1.8 BTN8

```
age.event.Button.BTN8
```

### 6.3.1.9 NONE

```
age.event.Button.NONE
```

The documentation for this enum was generated from the following file:

- [D:/GIT/repos/ODE/age/age/event/Button.java](#)

## 6.4 age.Client Class Reference

### Public Member Functions

- void [run](#) ()
- void [shutdown](#) ()

### Static Public Member Functions

- static void [main](#) (String[] args)

### Private Member Functions

- void [setup](#) ()
- void [setupGUI](#) ()
- void [toggleSysmenu](#) ()
- void [loop](#) ()
- void [render](#) (int count, long nanoperiod, float dT)
- void [update](#) (int count, long nanoperiod, float dT)

### Private Attributes

- Clock [clock](#) = new Clock()
- Events [events](#) = new Events()
- Widgets [widgets](#) = new Widgets()
- Tasks [tasks](#) = new Tasks()
- Port [port](#) = new JOGLPort()
- boolean [running](#) = false
- Widget [sysMenuFrame](#)

## 6.4.1 Member Function Documentation

### 6.4.1.1 loop()

```
void age.Client.loop ( ) [private]
```

#### 6.4.1.2 main()

```
static void age.Client.main (
    String[] args ) [static]
```

#### 6.4.1.3 render()

```
void age.Client.render (
    int count,
    long nanoperiod,
    float dT ) [private]
```

#### 6.4.1.4 run()

```
void age.Client.run ( )
```

#### 6.4.1.5 setup()

```
void age.Client.setup ( ) [private]
```

#### 6.4.1.6 setupGUI()

```
void age.Client.setupGUI ( ) [private]
```

#### 6.4.1.7 shutdown()

```
void age.Client.shutdown ( )
```

#### 6.4.1.8 toggleSysmenu()

```
void age.Client.toggleSysmenu ( ) [private]
```

#### 6.4.1.9 update()

```
void age.Client.update (
    int count,
    long nanoperiod,
    float dT ) [private]
```

### 6.4.2 Member Data Documentation

#### 6.4.2.1 clock

```
Clock age.Client.clock = new Clock() [private]
```

#### 6.4.2.2 events

```
Events age.Client.events = new Events() [private]
```

#### 6.4.2.3 port

```
Port age.Client.port = new JOGLPort() [private]
```

#### 6.4.2.4 running

```
boolean age.Client.running = false [private]
```

#### 6.4.2.5 sysMenuFrame

```
Widget age.Client.sysMenuFrame [private]
```

#### 6.4.2.6 tasks

```
Tasks age.Client.tasks = new Tasks() [private]
```

#### 6.4.2.7 widgets

```
Widgets age.Client.widgets = new Widgets() [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/[Client.java](#)

## 6.5 age.clock.Clock Class Reference

### Public Member Functions

- void [add](#) (long nanoperiod, [Task](#) task)
- void [addFPS](#) (int fps, [Task](#) task)
- void [init](#) ()
- void [update](#) ()

### Private Attributes

- final List< [Alarm](#) > [alarms](#) = new ArrayList<>()

## 6.5.1 Member Function Documentation

### 6.5.1.1 add()

```
void age.clock.Clock.add (
    long nanoperiod,
    Task task )
```

### 6.5.1.2 addFPS()

```
void age.clock.Clock.addFPS (
    int fps,
    Task task )
```

### 6.5.1.3 init()

```
void age.clock.Clock.init ( )
```

### 6.5.1.4 update()

```
void age.clock.Clock.update ( )
```

## 6.5.2 Member Data Documentation

### 6.5.2.1 alarms

```
final List<Alarm> age.clock.Clock.alarms = new ArrayList<>() [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/clock/[Clock.java](#)

## 6.6 age.gui.Dock Class Reference

### Public Member Functions

- float [top](#) ()
- float [bottom](#) ()
- float [left](#) ()
- float [right](#) ()
- void [set](#) ([Dock](#) dock)
- void [set](#) (float [left](#), float [right](#), float [top](#), float [bottom](#))

### Private Attributes

- float `left` = 0
- float `right` = 0
- float `top` = 0
- float `bottom` = 0

## 6.6.1 Member Function Documentation

### 6.6.1.1 `bottom()`

```
float age.gui.Dock.bottom ( )
```

### 6.6.1.2 `left()`

```
float age.gui.Dock.left ( )
```

### 6.6.1.3 `right()`

```
float age.gui.Dock.right ( )
```

### 6.6.1.4 `set()` [1/2]

```
void age.gui.Dock.set (
    Dock dock )
```

### 6.6.1.5 `set()` [2/2]

```
void age.gui.Dock.set (
    float left,
    float right,
    float top,
    float bottom )
```

### 6.6.1.6 `top()`

```
float age.gui.Dock.top ( )
```

## 6.6.2 Member Data Documentation

### 6.6.2.1 `bottom`

```
float age.gui.Dock.bottom = 0 [private]
```

### 6.6.2.2 left

```
float age.gui.Dock.left = 0 [private]
```

### 6.6.2.3 right

```
float age.gui.Dock.right = 0 [private]
```

### 6.6.2.4 top

```
float age.gui.Dock.top = 0 [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/Dock.java](#)

## 6.7 age.event.Event Class Reference

### Public Member Functions

- void [clear](#) ()
- [Type](#) [type](#) ()
- [Key](#) [key](#) ()
- char [character](#) ()
- [Button](#) [button](#) ()
- int [count](#) ()
- float [x](#) ()
- float [y](#) ()
- [Vector2f](#) [position](#) ()
- float [width](#) ()
- float [height](#) ()
- [Vector2f](#) [dimension](#) ()
- String [command](#) ()
- void [keyPressed](#) ([Key](#) [key](#), char [character](#))
- void [keyReleased](#) ([Key](#) [key](#), char [character](#))
- void [keyTyped](#) ([Key](#) [key](#), char [character](#))
- void [pointerEntered](#) (float [x](#), float [y](#))
- void [pointerExited](#) (float [x](#), float [y](#))
- void [pointerMoved](#) (float [x](#), float [y](#))
- void [pointerPressed](#) ([Button](#) [button](#), int [count](#), float [x](#), float [y](#))
- void [pointerClicked](#) ([Button](#) [button](#), int [count](#), float [x](#), float [y](#))
- void [pointerReleased](#) ([Button](#) [button](#), int [count](#), float [x](#), float [y](#))
- void [surfaceResized](#) (float w, float h)
- void [surfaceCloseRequest](#) ()
- void [taskCommand](#) (String [command](#))

### Package Functions

- [Event](#) ()

### Private Member Functions

- void `keyEvent` (`Type type`, `Key key`, char `character`)
- void `pointerEvent` (`Type type`, `Button button`, int `count`, float `x`, float `y`)

### Private Attributes

- `Type type` = `Type.NONE`
- `Key key` = `Key.NONE`
- char `character` = `'\0'`
- `Button button` = `Button.NONE`
- int `count` = `-1`
- `Vector2f position` = `new Vector2f()`
- `Vector2f dimension` = `new Vector2f()`
- String `command` = `null`

## 6.7.1 Constructor & Destructor Documentation

### 6.7.1.1 Event()

```
age.event.Event.Event ( ) [package]
```

## 6.7.2 Member Function Documentation

### 6.7.2.1 button()

```
Button age.event.Event.button ( )
```

### 6.7.2.2 character()

```
char age.event.Event.character ( )
```

### 6.7.2.3 clear()

```
void age.event.Event.clear ( )
```

### 6.7.2.4 command()

```
String age.event.Event.command ( )
```

### 6.7.2.5 count()

```
int age.event.Event.count ( )
```

#### 6.7.2.6 dimension()

```
Vector2f age.event.Event.dimension ( )
```

#### 6.7.2.7 height()

```
float age.event.Event.height ( )
```

#### 6.7.2.8 key()

```
Key age.event.Event.key ( )
```

#### 6.7.2.9 keyEvent()

```
void age.event.Event.keyEvent (
    Type type,
    Key key,
    char character ) [private]
```

#### 6.7.2.10 keyPressed()

```
void age.event.Event.keyPressed (
    Key key,
    char character )
```

#### 6.7.2.11 keyReleased()

```
void age.event.Event.keyReleased (
    Key key,
    char character )
```

#### 6.7.2.12 keyTyped()

```
void age.event.Event.keyTyped (
    Key key,
    char character )
```

#### 6.7.2.13 pointerClicked()

```
void age.event.Event.pointerClicked (
    Button button,
    int count,
    float x,
    float y )
```



#### 6.7.2.14 pointerEntered()

```
void age.event.Event.pointerEntered (
    float x,
    float y )
```

#### 6.7.2.15 pointerEvent()

```
void age.event.Event.pointerEvent (
    Type type,
    Button button,
    int count,
    float x,
    float y ) [private]
```

#### 6.7.2.16 pointerExited()

```
void age.event.Event.pointerExited (
    float x,
    float y )
```

#### 6.7.2.17 pointerMoved()

```
void age.event.Event.pointerMoved (
    float x,
    float y )
```

#### 6.7.2.18 pointerPressed()

```
void age.event.Event.pointerPressed (
    Button button,
    int count,
    float x,
    float y )
```

#### 6.7.2.19 pointerReleased()

```
void age.event.Event.pointerReleased (
    Button button,
    int count,
    float x,
    float y )
```

#### 6.7.2.20 position()

```
Vector2f age.event.Event.position ( )
```

#### 6.7.2.21 surfaceCloseRequest()

```
void age.event.Event.surfaceCloseRequest ( )
```

#### 6.7.2.22 surfaceResized()

```
void age.event.Event.surfaceResized (
    float w,
    float h )
```

#### 6.7.2.23 taskCommand()

```
void age.event.Event.taskCommand (
    String command )
```

#### 6.7.2.24 type()

```
Type age.event.Event.type ( )
```

#### 6.7.2.25 width()

```
float age.event.Event.width ( )
```

#### 6.7.2.26 x()

```
float age.event.Event.x ( )
```

#### 6.7.2.27 y()

```
float age.event.Event.y ( )
```

### 6.7.3 Member Data Documentation

#### 6.7.3.1 button

```
Button age.event.Event.button = Button.NONE [private]
```

#### 6.7.3.2 character

```
char age.event.Event.character = '\0' [private]
```

### 6.7.3.3 command

```
String age.event.Event.command = null [private]
```

### 6.7.3.4 count

```
int age.event.Event.count = -1 [private]
```

### 6.7.3.5 dimension

```
Vector2f age.event.Event.dimension = new Vector2f() [private]
```

### 6.7.3.6 key

```
Key age.event.Event.key = Key.NONE [private]
```

### 6.7.3.7 position

```
Vector2f age.event.Event.position = new Vector2f() [private]
```

### 6.7.3.8 type

```
Type age.event.Event.type = Type.NONE [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/event/Event.java](#)

## 6.8 age.event.Events Class Reference

### Public Member Functions

- void [assign](#) (Type type, Handler handler)
- void [postKeyPressed](#) (Key key, char character)
- void [postKeyReleased](#) (Key key, char character)
- void [postKeyTyped](#) (Key key, char character)
- void [postPointerEntered](#) (float x, float y)
- void [postPointerExited](#) (float x, float y)
- void [postPointerMoved](#) (float x, float y)
- void [postPointerPressed](#) (Button button, int count, float x, float y)
- void [postPointerReleased](#) (Button button, int count, float x, float y)
- void [postPointerClicked](#) (Button button, int count, float x, float y)
- void [postSurfaceResized](#) (float w, float h)
- void [postSurfaceCloseRequest](#) ()
- void [postTaskCommand](#) (String command)
- void [update](#) ()

## Private Member Functions

- void `handle` (`Event` event)
- void `post` (`Event` event)
- `Event alloc` ()
- void `free` (`Event` event)

## Private Attributes

- final Queue< `Event` > `cache` = new LinkedList<>()
- final List< `Event` > `inbox` = new ArrayList<>()
- final List< `Event` > `outbox` = new ArrayList<>()
- final Map< `Type`, List< `Handler` > > `handlers` = new EnumMap<>(Type.class)

## 6.8.1 Member Function Documentation

### 6.8.1.1 alloc()

```
Event age.event.Events.alloc ( ) [private]
```

### 6.8.1.2 assign()

```
void age.event.Events.assign (
    Type type,
    Handler handler )
```

### 6.8.1.3 free()

```
void age.event.Events.free (
    Event event ) [private]
```

### 6.8.1.4 handle()

```
void age.event.Events.handle (
    Event event ) [private]
```

### 6.8.1.5 post()

```
void age.event.Events.post (
    Event event ) [private]
```

### 6.8.1.6 postKeyPressed()

```
void age.event.Events.postKeyPressed (
    Key key,
    char character )
```

#### 6.8.1.7 postKeyReleased()

```
void age.event.Events.postKeyReleased (
    Key key,
    char character )
```

#### 6.8.1.8 postKeyTyped()

```
void age.event.Events.postKeyTyped (
    Key key,
    char character )
```

#### 6.8.1.9 postPointerClicked()

```
void age.event.Events.postPointerClicked (
    Button button,
    int count,
    float x,
    float y )
```

#### 6.8.1.10 postPointerEntered()

```
void age.event.Events.postPointerEntered (
    float x,
    float y )
```

#### 6.8.1.11 postPointerExited()

```
void age.event.Events.postPointerExited (
    float x,
    float y )
```

#### 6.8.1.12 postPointerMoved()

```
void age.event.Events.postPointerMoved (
    float x,
    float y )
```

#### 6.8.1.13 postPointerPressed()

```
void age.event.Events.postPointerPressed (
    Button button,
    int count,
    float x,
    float y )
```

#### 6.8.1.14 postPointerReleased()

```
void age.event.Events.postPointerReleased (
    Button button,
    int count,
    float x,
    float y )
```

#### 6.8.1.15 postSurfaceCloseRequest()

```
void age.event.Events.postSurfaceCloseRequest ( )
```

#### 6.8.1.16 postSurfaceResized()

```
void age.event.Events.postSurfaceResized (
    float w,
    float h )
```

#### 6.8.1.17 postTaskCommand()

```
void age.event.Events.postTaskCommand (
    String command )
```

#### 6.8.1.18 update()

```
void age.event.Events.update ( )
```

### 6.8.2 Member Data Documentation

#### 6.8.2.1 cache

```
final Queue<Event> age.event.Events.cache = new LinkedList<>() [private]
```

#### 6.8.2.2 handlers

```
final Map<Type, List<Handler> > age.event.Events.handlers = new EnumMap<>(Type.class) [private]
```

#### 6.8.2.3 inbox

```
final List<Event> age.event.Events.inbox = new ArrayList<>() [private]
```

#### 6.8.2.4 outbox

```
final List<Event> age.event.Events.outbox = new ArrayList<>() [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/event/[Events.java](#)

## 6.9 age.gui.Flag Enum Reference

### Public Attributes

- [BOX](#)
- [FRAME](#)
- [BUTTON](#)
- [CANVAS](#)
- [TITLE](#)
- [MULTILINE](#)
- [HOVERED](#)
- [HIDDEN](#)

### 6.9.1 Member Data Documentation

#### 6.9.1.1 BOX

```
age.gui.Flag.BOX
```

#### 6.9.1.2 BUTTON

```
age.gui.Flag.BUTTON
```

#### 6.9.1.3 CANVAS

```
age.gui.Flag.CANVAS
```

#### 6.9.1.4 FRAME

```
age.gui.Flag.FRAME
```

#### 6.9.1.5 HIDDEN

```
age.gui.Flag.HIDDEN
```

### 6.9.1.6 HOVERED

```
age.gui.Flag.HOVERED
```

### 6.9.1.7 MULTILINE

```
age.gui.Flag.MULTILINE
```

### 6.9.1.8 TITLE

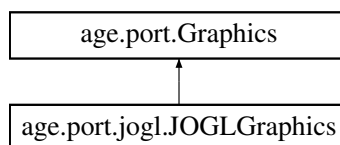
```
age.gui.Flag.TITLE
```

The documentation for this enum was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/Flag.java](#)

## 6.10 age.port.Graphics Interface Reference

Inheritance diagram for age.port.Graphics:



### Public Member Functions

- void [mode2D](#) ()
- void [pushTransformation](#) ()
- void [popTransformation](#) ()
- void [color](#) (Color4f c)
- void [color](#) (float r, float g, float b)
- void [color](#) (float r, float g, float b, float a)
- void [translate](#) (Vector2f pos)
- void [translate](#) (float x, float y)
- void [rectangle](#) (Vector2f dim, boolean hollow)
- void [rectangle](#) (Vector2f pos, Vector2f dim, boolean hollow)
- void [rectangle](#) (float x, float y, float w, float h, boolean hollow)
- void [text](#) (float x, float y, CharSequence text, String font)
- void [texture](#) (float x, float y, float w, float h, String texture)
- void [calcMultitext](#) (String [text](#), Vector2f dimension, String font, int[] buffer)
- void [calcMultitext](#) (String [text](#), float width, float height, String font, int[] buffer)



## 6.10.1 Member Function Documentation

### 6.10.1.1 calcMultitext() [1/2]

```
void age.port.Graphics.calcMultitext (
    String text,
    float width,
    float height,
    String font,
    int[] buffer )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

### 6.10.1.2 calcMultitext() [2/2]

```
void age.port.Graphics.calcMultitext (
    String text,
    Vector2f dimension,
    String font,
    int[] buffer )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

### 6.10.1.3 color() [1/3]

```
void age.port.Graphics.color (
    Color4f c )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

### 6.10.1.4 color() [2/3]

```
void age.port.Graphics.color (
    float r,
    float g,
    float b )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

### 6.10.1.5 color() [3/3]

```
void age.port.Graphics.color (
    float r,
    float g,
    float b,
    float a )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.6 mode2D()

```
void age.port.Graphics.mode2D ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.7 popTransformation()

```
void age.port.Graphics.popTransformation ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.8 pushTransformation()

```
void age.port.Graphics.pushTransformation ( )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.9 rectangle() [1/3]

```
void age.port.Graphics.rectangle (
    float x,
    float y,
    float w,
    float h,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.10 rectangle() [2/3]

```
void age.port.Graphics.rectangle (
    Vector2f dim,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.11 rectangle() [3/3]

```
void age.port.Graphics.rectangle (
    Vector2f pos,
    Vector2f dim,
    boolean hollow )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.12 text()

```
void age.port.Graphics.text (
    float x,
    float y,
    CharSequence text,
    String font )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.13 texture()

```
void age.port.Graphics.texture (
    float x,
    float y,
    float w,
    float h,
    String texture )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.14 translate() [1/2]

```
void age.port.Graphics.translate (
    float x,
    float y )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

#### 6.10.1.15 translate() [2/2]

```
void age.port.Graphics.translate (
    Vector2f pos )
```

Implemented in [age.port.jogl.JOGLGraphics](#).

The documentation for this interface was generated from the following file:

- [D:/GIT/repos/ODE/age/age/port/Graphics.java](#)

## 6.11 age.event.Handler Interface Reference

### Public Member Functions

- void [handle](#) ([Event](#) event)

## 6.11.1 Member Function Documentation

### 6.11.1.1 handle()

```
void age.event.Handler.handle (
    Event event )
```

The documentation for this interface was generated from the following file:

- [D:/GIT/repos/ODE/age/age/event/Handler.java](#)

## 6.12 age.gui.Handling Class Reference

### Public Member Functions

- [Handling](#) ([Widgets](#) widgets)
- void [assign](#) ([Events](#) events)
- void [handleKeyboard](#) ([Event](#) e)
- void [handlePointer](#) ([Event](#) e)
- void [handleSurface](#) ([Event](#) e)

### Private Member Functions

- void [pressedFrameToFront](#) ([Event](#) e)
- void [buttonClickAction](#) ([Event](#) e)
- void [startFrameSizeAction](#) ([Event](#) e)
- void [startFrameDragAction](#) ([Event](#) e)
- void [updateActionState](#) ([Event](#) e, [String](#) action)
- void [updateFrameAction](#) ([Event](#) e)
- void [stopFrameAction](#) ([Event](#) e)
- [Widget](#) hovered ([Vector2f](#) pos, [Widget](#) widget)

### Private Attributes

- [Events](#) events
- final [Widgets](#) widgets
- [Widget](#) hovered = null
- [Widget](#) dragged = null
- [String](#) action = null
- final [Vector2f](#) ref = new [Vector2f](#)()
- final [Vector2f](#) tmp = new [Vector2f](#)()

## 6.12.1 Constructor & Destructor Documentation

### 6.12.1.1 Handling()

```
age.gui.Handling.Handling (
    Widgets widgets )
```

## 6.12.2 Member Function Documentation

### 6.12.2.1 assign()

```
void age.gui.Handling.assign (
    Events events )
```

### 6.12.2.2 buttonClickAction()

```
void age.gui.Handling.buttonClickAction (
    Event e ) [private]
```

### 6.12.2.3 handleKeyboard()

```
void age.gui.Handling.handleKeyboard (
    Event e )
```

### 6.12.2.4 handlePointer()

```
void age.gui.Handling.handlePointer (
    Event e )
```

### 6.12.2.5 handleSurface()

```
void age.gui.Handling.handleSurface (
    Event e )
```

### 6.12.2.6 hovered()

```
Widget age.gui.Handling.hovered (
    Vector2f pos,
    Widget widget ) [private]
```

### 6.12.2.7 pressedFrameToFront()

```
void age.gui.Handling.pressedFrameToFront (
    Event e ) [private]
```

### 6.12.2.8 startFrameDragAction()

```
void age.gui.Handling.startFrameDragAction (
    Event e ) [private]
```

#### 6.12.2.9 startFrameSizeAction()

```
void age.gui.Handling.startFrameSizeAction (
    Event e ) [private]
```

#### 6.12.2.10 stopFrameAction()

```
void age.gui.Handling.stopFrameAction (
    Event e ) [private]
```

#### 6.12.2.11 updateActionState()

```
void age.gui.Handling.updateActionState (
    Event e,
    String action ) [private]
```

#### 6.12.2.12 updateFrameAction()

```
void age.gui.Handling.updateFrameAction (
    Event e ) [private]
```

### 6.12.3 Member Data Documentation

#### 6.12.3.1 action

```
String age.gui.Handling.action = null [private]
```

#### 6.12.3.2 dragged

```
Widget age.gui.Handling.dragged = null [private]
```

#### 6.12.3.3 events

```
Events age.gui.Handling.events [private]
```

#### 6.12.3.4 hovered

```
Widget age.gui.Handling.hovered = null [private]
```

#### 6.12.3.5 ref

```
final Vector2f age.gui.Handling.ref = new Vector2f() [private]
```

### 6.12.3.6 tmp

```
final Vector2f age.gui.Handling.tmp = new Vector2f() [private]
```

### 6.12.3.7 widgets

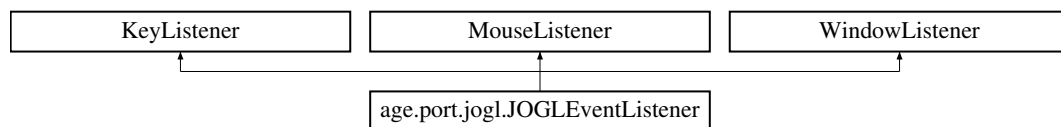
```
final Widgets age.gui.Handling.widgets [private]
```

The documentation for this class was generated from the following file:

- <D:/GIT/repos/ODE/age/age/gui/Handling.java>

## 6.13 age.port.jogl.JOGLEventListener Class Reference

Inheritance diagram for age.port.jogl.JOGLEventListener:



### Public Member Functions

- void [assign](#) (Events [events](#))
- void [mouseClicked](#) (MouseEvent [e](#))
- void [mouseEntered](#) (MouseEvent [e](#))
- void [mouseExited](#) (MouseEvent [e](#))
- void [mousePressed](#) (MouseEvent [e](#))
- void [mouseReleased](#) (MouseEvent [e](#))
- void [mouseMoved](#) (MouseEvent [e](#))
- void [mouseDragged](#) (MouseEvent [e](#))
- void [mouseWheelMoved](#) (MouseEvent [e](#))
- void [keyPressed](#) (KeyEvent [e](#))
- void [keyReleased](#) (KeyEvent [e](#))
- void [windowResized](#) (WindowEvent [e](#))
- void [windowMoved](#) (WindowEvent [e](#))
- void [windowDestroyNotify](#) (WindowEvent [e](#))
- void [windowDestroyed](#) (WindowEvent [e](#))
- void [windowGainedFocus](#) (WindowEvent [e](#))
- void [windowLostFocus](#) (WindowEvent [e](#))
- void [windowRepaint](#) (WindowUpdateEvent [e](#))

### Private Member Functions

- void [handleSurfaceCloseRequest](#) (Event [e](#))
- Button [translateButton](#) (short [button](#))
- Key [translateKey](#) (short [key](#))

## Private Attributes

- Events `events` = null

## 6.13.1 Member Function Documentation

### 6.13.1.1 `assign()`

```
void age.port.jogl.JOGLEventListener.assign (
    Events events )
```

### 6.13.1.2 `handleSurfaceCloseRequest()`

```
void age.port.jogl.JOGLEventListener.handleSurfaceCloseRequest (
    Event e ) [private]
```

### 6.13.1.3 `keyPressed()`

```
void age.port.jogl.JOGLEventListener.keyPressed (
    KeyEvent e )
```

### 6.13.1.4 `keyReleased()`

```
void age.port.jogl.JOGLEventListener.keyReleased (
    KeyEvent e )
```

### 6.13.1.5 `mouseClicked()`

```
void age.port.jogl.JOGLEventListener.mouseClicked (
    MouseEvent e )
```

### 6.13.1.6 `mouseDragged()`

```
void age.port.jogl.JOGLEventListener.mouseDragged (
    MouseEvent e )
```

### 6.13.1.7 `mouseEntered()`

```
void age.port.jogl.JOGLEventListener.mouseEntered (
    MouseEvent e )
```

### 6.13.1.8 `mouseExited()`

```
void age.port.jogl.JOGLEventListener.mouseExited (
    MouseEvent e )
```



**6.13.1.9 mouseMoved()**

```
void age.port.jogl.JOGLEventListener.mouseMoved (
    MouseEvent e )
```

**6.13.1.10 mousePressed()**

```
void age.port.jogl.JOGLEventListener.mousePressed (
    MouseEvent e )
```

**6.13.1.11 mouseReleased()**

```
void age.port.jogl.JOGLEventListener.mouseReleased (
    MouseEvent e )
```

**6.13.1.12 mouseWheelMoved()**

```
void age.port.jogl.JOGLEventListener.mouseWheelMoved (
    MouseEvent e )
```

**6.13.1.13 translateButton()**

```
Button age.port.jogl.JOGLEventListener.translateButton (
    short button ) [private]
```

**6.13.1.14 translateKey()**

```
Key age.port.jogl.JOGLEventListener.translateKey (
    short key ) [private]
```

**6.13.1.15 windowDestroyed()**

```
void age.port.jogl.JOGLEventListener.windowDestroyed (
    WindowEvent e )
```

**6.13.1.16 windowDestroyNotify()**

```
void age.port.jogl.JOGLEventListener.windowDestroyNotify (
    WindowEvent e )
```

**6.13.1.17 windowGainedFocus()**

```
void age.port.jogl.JOGLEventListener.windowGainedFocus (
    WindowEvent e )
```

#### 6.13.1.18 windowLostFocus()

```
void age.port.jogl.JOGLEventListener.windowLostFocus (
    WindowEvent e )
```

#### 6.13.1.19 windowMoved()

```
void age.port.jogl.JOGLEventListener.windowMoved (
    WindowEvent e )
```

#### 6.13.1.20 windowRepaint()

```
void age.port.jogl.JOGLEventListener.windowRepaint (
    WindowUpdateEvent e )
```

#### 6.13.1.21 windowResized()

```
void age.port.jogl.JOGLEventListener.windowResized (
    WindowEvent e )
```

### 6.13.2 Member Data Documentation

#### 6.13.2.1 events

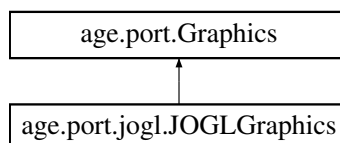
```
Events age.port.jogl.JOGLEventListener.events = null [private]
```

The documentation for this class was generated from the following file:

- <D:/GIT/repos/ODE/age/age/port/jogl/JOGLEventListener.java>

## 6.14 age.port.jogl.JOGLGraphics Class Reference

Inheritance diagram for age.port.jogl.JOGLGraphics:



## Public Member Functions

- void [assign](#) (GLAutoDrawable [drawable](#))
- void [init](#) ()
- void [clear](#) ()
- void [mode2D](#) ()
- void [mode3D](#) (float fovy, float near, float far)
- void [pushTransformation](#) ()
- void [popTransformation](#) ()
- void [translate](#) (Vector2f t)
- void [translate](#) (float x, float y)
- void [color](#) (Color4f c)
- void [color](#) (float r, float g, float b)
- void [color](#) (float r, float g, float b, float a)
- void [rectangle](#) (Vector2f dim, boolean hollow)
- void [rectangle](#) (Vector2f pos, Vector2f dim, boolean hollow)
- void [rectangle](#) (float x, float y, float w, float h, boolean hollow)
- void [text](#) (float x, float y, CharSequence text, String font)
- void [texture](#) (float x, float y, float w, float h, String texture)
- void [calcMultitext](#) (String [text](#), Vector2f dimension, String font, int[] buffer)
- void [calcMultitext](#) (String [text](#), float width, float height, String font, int[] buffer)

## Private Attributes

- GLAutoDrawable [drawable](#) = null
- GL2 [gl](#) = null
- GLU [glu](#) = null
- Map< String, Texture > [textures](#) = new HashMap<>()
- Map< String, TextRenderer > [fonts](#) = new HashMap<>()

## 6.14.1 Member Function Documentation

### 6.14.1.1 [assign\(\)](#)

```
void age.port.jogl.JOGLGraphics.assign (
    GLAutoDrawable drawable )
```

### 6.14.1.2 [calcMultitext\(\)](#) [1/2]

```
void age.port.jogl.JOGLGraphics.calcMultitext (
    String text,
    float width,
    float height,
    String font,
    int[] buffer )
```

Implements [age.port.Graphics](#).

#### 6.14.1.3 calcMultitext() [2/2]

```
void age.port.jogl.JOGLGraphics.calcMultitext (
    String text,
    Vector2f dimension,
    String font,
    int[] buffer )
```

Implements [age.port.Graphics](#).

#### 6.14.1.4 clear()

```
void age.port.jogl.JOGLGraphics.clear ( )
```

#### 6.14.1.5 color() [1/3]

```
void age.port.jogl.JOGLGraphics.color (
    Color4f c )
```

Implements [age.port.Graphics](#).

#### 6.14.1.6 color() [2/3]

```
void age.port.jogl.JOGLGraphics.color (
    float r,
    float g,
    float b )
```

Implements [age.port.Graphics](#).

#### 6.14.1.7 color() [3/3]

```
void age.port.jogl.JOGLGraphics.color (
    float r,
    float g,
    float b,
    float a )
```

Implements [age.port.Graphics](#).

#### 6.14.1.8 init()

```
void age.port.jogl.JOGLGraphics.init ( )
```

#### 6.14.1.9 mode2D()

```
void age.port.jogl.JOGLGraphics.mode2D ( )
```

Implements [age.port.Graphics](#).

**6.14.1.10 mode3D()**

```
void age.port.jogl.JOGLGraphics.mode3D (
    float fovy,
    float near,
    float far )
```

**6.14.1.11 popTransformation()**

```
void age.port.jogl.JOGLGraphics.popTransformation ( )
```

Implements [age.port.Graphics](#).

**6.14.1.12 pushTransformation()**

```
void age.port.jogl.JOGLGraphics.pushTransformation ( )
```

Implements [age.port.Graphics](#).

**6.14.1.13 rectangle() [1/3]**

```
void age.port.jogl.JOGLGraphics.rectangle (
    float x,
    float y,
    float w,
    float h,
    boolean hollow )
```

Implements [age.port.Graphics](#).

**6.14.1.14 rectangle() [2/3]**

```
void age.port.jogl.JOGLGraphics.rectangle (
    Vector2f dim,
    boolean hollow )
```

Implements [age.port.Graphics](#).

**6.14.1.15 rectangle() [3/3]**

```
void age.port.jogl.JOGLGraphics.rectangle (
    Vector2f pos,
    Vector2f dim,
    boolean hollow )
```

Implements [age.port.Graphics](#).

#### 6.14.1.16 text()

```
void age.port.jogl.JOGLGraphics.text (
    float x,
    float y,
    CharSequence text,
    String font )
```

Implements [age.port.Graphics](#).

#### 6.14.1.17 texture()

```
void age.port.jogl.JOGLGraphics.texture (
    float x,
    float y,
    float w,
    float h,
    String texture )
```

Implements [age.port.Graphics](#).

#### 6.14.1.18 translate() [1/2]

```
void age.port.jogl.JOGLGraphics.translate (
    float x,
    float y )
```

Implements [age.port.Graphics](#).

#### 6.14.1.19 translate() [2/2]

```
void age.port.jogl.JOGLGraphics.translate (
    Vector2f t )
```

Implements [age.port.Graphics](#).

### 6.14.2 Member Data Documentation

#### 6.14.2.1 drawable

```
GLAutoDrawable age.port.jogl.JOGLGraphics.drawable = null [private]
```

#### 6.14.2.2 fonts

```
Map<String, TextRenderer> age.port.jogl.JOGLGraphics.fonts = new HashMap<>() [private]
```

### 6.14.2.3 gl

```
GL2 age.port.jogl.JOGLGraphics.gl = null [private]
```

### 6.14.2.4 glu

```
GLU age.port.jogl.JOGLGraphics.glu = null [private]
```

### 6.14.2.5 textures

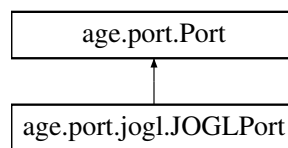
```
Map<String, Texture> age.port.jogl.JOGLGraphics.textures = new HashMap<>() [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/port/jogl/[JOGLGraphics.java](#)

## 6.15 age.port.jogl.JOGLPort Class Reference

Inheritance diagram for age.port.jogl.JOGLPort:



### Public Member Functions

- void [assign](#) (Events events)
- String [title](#) ()
- void [title](#) (String title)
- boolean [maximized](#) ()
- void [maximized](#) (boolean maximized)
- boolean [fullscreen](#) ()
- void [fullscreen](#) (boolean fullscreen)
- boolean [visible](#) ()
- void [visible](#) (boolean visible)
- float [width](#) ()
- float [height](#) ()
- void [size](#) (float [width](#), float [height](#))
- void [add](#) ([Renderable](#) renderable)
- List< [Renderable](#) > [get](#) ()
- void [create](#) ()
- void [render](#) ()

## Private Attributes

- GLWindow [window](#) = null
- JOGLEventListener [eventListener](#) = null
- JOGLRenderListener [renderListener](#) = null
- final List< [Renderable](#) > [renderables](#) = new ArrayList<>()
- final List< [Renderable](#) > [renderables\\_ro](#) = Collections.unmodifiableList([renderables](#))

## 6.15.1 Member Function Documentation

### 6.15.1.1 add()

```
void age.port.jogl.JOGLPort.add (
    Renderable renderable )
```

Implements [age.port.Port](#).

### 6.15.1.2 assign()

```
void age.port.jogl.JOGLPort.assign (
    Events events )
```

Implements [age.port.Port](#).

### 6.15.1.3 create()

```
void age.port.jogl.JOGLPort.create ( )
```

Implements [age.port.Port](#).

### 6.15.1.4 fullscreen() [1/2]

```
boolean age.port.jogl.JOGLPort.fullscreen ( )
```

Implements [age.port.Port](#).

### 6.15.1.5 fullscreen() [2/2]

```
void age.port.jogl.JOGLPort.fullscreen (
    boolean fullscreen )
```

Implements [age.port.Port](#).

### 6.15.1.6 get()

```
List< Renderable > age.port.jogl.JOGLPort.get ( )
```



### 6.15.1.7 height()

```
float age.port.jogl.JOGLPort.height ( )
```

Implements [age.port.Port](#).

### 6.15.1.8 maximized() [1/2]

```
boolean age.port.jogl.JOGLPort.maximized ( )
```

Implements [age.port.Port](#).

### 6.15.1.9 maximized() [2/2]

```
void age.port.jogl.JOGLPort.maximized (
    boolean maximized )
```

Implements [age.port.Port](#).

### 6.15.1.10 render()

```
void age.port.jogl.JOGLPort.render ( )
```

Implements [age.port.Port](#).

### 6.15.1.11 size()

```
void age.port.jogl.JOGLPort.size (
    float width,
    float height )
```

Implements [age.port.Port](#).

### 6.15.1.12 title() [1/2]

```
String age.port.jogl.JOGLPort.title ( )
```

Implements [age.port.Port](#).

### 6.15.1.13 title() [2/2]

```
void age.port.jogl.JOGLPort.title (
    String title )
```

Implements [age.port.Port](#).

**6.15.1.14 visible() [1/2]**

```
boolean age.port.jogl.JOGLPort.visible ( )
```

Implements [age.port.Port](#).

**6.15.1.15 visible() [2/2]**

```
void age.port.jogl.JOGLPort.visible (
    boolean visible )
```

Implements [age.port.Port](#).

**6.15.1.16 width()**

```
float age.port.jogl.JOGLPort.width ( )
```

Implements [age.port.Port](#).

**6.15.2 Member Data Documentation****6.15.2.1 eventListener**

```
JOGLEventListener age.port.jogl.JOGLPort.eventListener = null [private]
```

**6.15.2.2 renderables**

```
final List<Renderable> age.port.jogl.JOGLPort.renderables = new ArrayList<>() [private]
```

**6.15.2.3 renderables\_ro**

```
final List<Renderable> age.port.jogl.JOGLPort.renderables_ro = Collections.unmodifiable←
List(renderables) [private]
```

**6.15.2.4 renderListener**

```
JOGLRenderListener age.port.jogl.JOGLPort.renderListener = null [private]
```

**6.15.2.5 window**

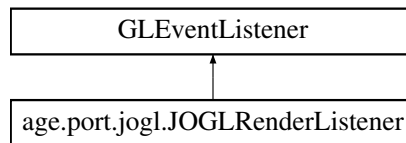
```
GLWindow age.port.jogl.JOGLPort.window = null [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/port/jogl/[JOGLPort.java](#)

## 6.16 age.port.jogl.JOGLRenderListener Class Reference

Inheritance diagram for age.port.jogl.JOGLRenderListener:



### Public Member Functions

- [JOGLRenderListener](#) ([JOGLPort](#) port)
- void [init](#) (GLAutoDrawable drawable)
- void [reshape](#) (GLAutoDrawable drawable, int x, int y, int width, int height)
- void [display](#) (GLAutoDrawable drawable)
- void [dispose](#) (GLAutoDrawable drawable)

### Private Attributes

- final [JOGLPort](#) port
- final [JOGLGraphics](#) graphics

### 6.16.1 Constructor & Destructor Documentation

#### 6.16.1.1 JOGLRenderListener()

```
age.port.jogl.JOGLRenderListener.JOGLRenderListener (
    JOGLPort port )
```

### 6.16.2 Member Function Documentation

#### 6.16.2.1 display()

```
void age.port.jogl.JOGLRenderListener.display (
    GLAutoDrawable drawable )
```

#### 6.16.2.2 dispose()

```
void age.port.jogl.JOGLRenderListener.dispose (
    GLAutoDrawable drawable )
```

#### 6.16.2.3 init()

```
void age.port.jogl.JOGLRenderListener.init (
    GLAutoDrawable drawable )
```

#### 6.16.2.4 reshape()

```
void age.port.jogl.JOGLRenderListener.reshape (
    GLAutoDrawable drawable,
    int x,
    int y,
    int width,
    int height )
```

### 6.16.3 Member Data Documentation

#### 6.16.3.1 graphics

```
final JOGLGraphics age.port.jogl.JOGLRenderListener.graphics [private]
```

#### 6.16.3.2 port

```
final JOGLPort age.port.jogl.JOGLRenderListener.port [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/port/jogl/JOGLRenderListener.java](#)

## 6.17 age.event.Key Enum Reference

### Public Attributes

- [NONE](#)
- [ESCAPE](#)
- [F1](#)
- [F2](#)
- [F3](#)
- [F4](#)
- [F5](#)
- [F6](#)
- [F7](#)
- [F8](#)
- [F9](#)
- [F10](#)
- [F11](#)
- [F12](#)
- [PRINT\\_SCREEN](#)
- [SCROLL\\_LOCK](#)
- [PAUSE](#)
- [\\_1](#)
- [\\_2](#)
- [\\_3](#)
- [\\_4](#)
- [\\_5](#)

- [\\_6](#)
- [\\_7](#)
- [\\_8](#)
- [\\_9](#)
- [\\_0](#)
- [BACK\\_SPACE](#)
- [TAB](#)
- [ENTER](#)
- [SPACE](#)
- [Q](#)
- [W](#)
- [E](#)
- [R](#)
- [T](#)
- [Z](#)
- [U](#)
- [I](#)
- [O](#)
- [P](#)
- [A](#)
- [S](#)
- [D](#)
- [F](#)
- [G](#)
- [H](#)
- [J](#)
- [K](#)
- [L](#)
- [Y](#)
- [X](#)
- [C](#)
- [V](#)
- [B](#)
- [N](#)
- [M](#)
- [PLUS](#)
- [MINUS](#)
- [CAPS\\_LOCK](#)
- [SHIFT](#)
- [CONTROL](#)
- [SYSTEM](#)
- [ALT](#)
- [MENU](#)
- [INSERT](#)
- [DELETE](#)
- [POS1](#)
- [END](#)
- [PAGE\\_UP](#)
- [PAGE\\_DOWN](#)
- [UP](#)
- [DOWN](#)
- [LEFT](#)
- [RIGHT](#)
- [NUM\\_LOCK](#)
- [DIVIDE](#)

- [MULTIPLY](#)
- [SUBTRACT](#)
- [ADD](#)
- [DECIMAL](#)
- [NP\\_7](#)
- [NP\\_8](#)
- [NP\\_9](#)
- [NP\\_4](#)
- [NP\\_5](#)
- [NP\\_6](#)
- [NP\\_1](#)
- [NP\\_2](#)
- [NP\\_3](#)
- [NP\\_0](#)

## 6.17.1 Member Data Documentation

### 6.17.1.1 `_0`

`age.event.Key._0`

### 6.17.1.2 `_1`

`age.event.Key._1`

### 6.17.1.3 `_2`

`age.event.Key._2`

### 6.17.1.4 `_3`

`age.event.Key._3`

### 6.17.1.5 `_4`

`age.event.Key._4`

### 6.17.1.6 `_5`

`age.event.Key._5`

### 6.17.1.7 `_6`

`age.event.Key._6`

**6.17.1.8 \_7**

`age.event.Key._7`

**6.17.1.9 \_8**

`age.event.Key._8`

**6.17.1.10 \_9**

`age.event.Key._9`

**6.17.1.11 A**

`age.event.Key.A`

**6.17.1.12 ADD**

`age.event.Key.ADD`

**6.17.1.13 ALT**

`age.event.Key.ALT`

**6.17.1.14 B**

`age.event.Key.B`

**6.17.1.15 BACK\_SPACE**

`age.event.Key.BACK_SPACE`

**6.17.1.16 C**

`age.event.Key.C`

**6.17.1.17 CAPS\_LOCK**

`age.event.Key.CAPS_LOCK`

**6.17.1.18 CONTROL**

```
age.event.Key.CONTROL
```

**6.17.1.19 D**

```
age.event.Key.D
```

**6.17.1.20 DECIMAL**

```
age.event.Key.DECIMAL
```

**6.17.1.21 DELETE**

```
age.event.Key.DELETE
```

**6.17.1.22 DIVIDE**

```
age.event.Key.DIVIDE
```

**6.17.1.23 DOWN**

```
age.event.Key.DOWN
```

**6.17.1.24 E**

```
age.event.Key.E
```

**6.17.1.25 END**

```
age.event.Key.END
```

**6.17.1.26 ENTER**

```
age.event.Key.ENTER
```

**6.17.1.27 ESCAPE**

```
age.event.Key.ESCAPE
```



**6.17.1.28 F**

```
age.event.Key.F
```

**6.17.1.29 F1**

```
age.event.Key.F1
```

**6.17.1.30 F10**

```
age.event.Key.F10
```

**6.17.1.31 F11**

```
age.event.Key.F11
```

**6.17.1.32 F12**

```
age.event.Key.F12
```

**6.17.1.33 F2**

```
age.event.Key.F2
```

**6.17.1.34 F3**

```
age.event.Key.F3
```

**6.17.1.35 F4**

```
age.event.Key.F4
```

**6.17.1.36 F5**

```
age.event.Key.F5
```

**6.17.1.37 F6**

```
age.event.Key.F6
```

**6.17.1.38 F7**

`age.event.Key.F7`

**6.17.1.39 F8**

`age.event.Key.F8`

**6.17.1.40 F9**

`age.event.Key.F9`

**6.17.1.41 G**

`age.event.Key.G`

**6.17.1.42 H**

`age.event.Key.H`

**6.17.1.43 I**

`age.event.Key.I`

**6.17.1.44 INSERT**

`age.event.Key.INSERT`

**6.17.1.45 J**

`age.event.Key.J`

**6.17.1.46 K**

`age.event.Key.K`

**6.17.1.47 L**

`age.event.Key.L`

**6.17.1.48 LEFT**

```
age.event.Key.LEFT
```

**6.17.1.49 M**

```
age.event.Key.M
```

**6.17.1.50 MENU**

```
age.event.Key.MENU
```

**6.17.1.51 MINUS**

```
age.event.Key.MINUS
```

**6.17.1.52 MULTIPLY**

```
age.event.Key.MULTIPLY
```

**6.17.1.53 N**

```
age.event.Key.N
```

**6.17.1.54 NONE**

```
age.event.Key.NONE
```

**6.17.1.55 NP\_0**

```
age.event.Key.NP_0
```

**6.17.1.56 NP\_1**

```
age.event.Key.NP_1
```

**6.17.1.57 NP\_2**

```
age.event.Key.NP_2
```

**6.17.1.58 NP\_3**

`age.event.Key.NP_3`

**6.17.1.59 NP\_4**

`age.event.Key.NP_4`

**6.17.1.60 NP\_5**

`age.event.Key.NP_5`

**6.17.1.61 NP\_6**

`age.event.Key.NP_6`

**6.17.1.62 NP\_7**

`age.event.Key.NP_7`

**6.17.1.63 NP\_8**

`age.event.Key.NP_8`

**6.17.1.64 NP\_9**

`age.event.Key.NP_9`

**6.17.1.65 NUM\_LOCK**

`age.event.Key.NUM_LOCK`

**6.17.1.66 O**

`age.event.Key.O`

**6.17.1.67 P**

`age.event.Key.P`

**6.17.1.68 PAGE\_DOWN**

```
age.event.Key.PAGE_DOWN
```

**6.17.1.69 PAGE\_UP**

```
age.event.Key.PAGE_UP
```

**6.17.1.70 PAUSE**

```
age.event.Key.PAUSE
```

**6.17.1.71 PLUS**

```
age.event.Key.PLUS
```

**6.17.1.72 POS1**

```
age.event.Key.POS1
```

**6.17.1.73 PRINT\_SCREEN**

```
age.event.Key.PRINT_SCREEN
```

**6.17.1.74 Q**

```
age.event.Key.Q
```

**6.17.1.75 R**

```
age.event.Key.R
```

**6.17.1.76 RIGHT**

```
age.event.Key.RIGHT
```

**6.17.1.77 S**

```
age.event.Key.S
```

**6.17.1.78 SCROLL\_LOCK**

```
age.event.Key.SCROLL_LOCK
```

**6.17.1.79 SHIFT**

```
age.event.Key.SHIFT
```

**6.17.1.80 SPACE**

```
age.event.Key.SPACE
```

**6.17.1.81 SUBTRACT**

```
age.event.Key.SUBTRACT
```

**6.17.1.82 SYSTEM**

```
age.event.Key.SYSTEM
```

**6.17.1.83 T**

```
age.event.Key.T
```

**6.17.1.84 TAB**

```
age.event.Key.TAB
```

**6.17.1.85 U**

```
age.event.Key.U
```

**6.17.1.86 UP**

```
age.event.Key.UP
```

**6.17.1.87 V**

```
age.event.Key.V
```

**6.17.1.88 W**

```
age.event.Key.W
```

**6.17.1.89 X**

```
age.event.Key.X
```

**6.17.1.90 Y**

```
age.event.Key.Y
```

**6.17.1.91 Z**

```
age.event.Key.Z
```

The documentation for this enum was generated from the following file:

- [D:/GIT/repos/ODE/age/age/event/Key.java](#)

## 6.18 age.log.Level Enum Reference

### Public Attributes

- [ERROR](#)
- [WARNING](#)
- [INFO](#)
- [DEBUG](#)

### 6.18.1 Member Data Documentation

**6.18.1.1 DEBUG**

```
age.log.Level.DEBUG
```

**6.18.1.2 ERROR**

```
age.log.Level.ERROR
```

**6.18.1.3 INFO**

```
age.log.Level.INFO
```

#### 6.18.1.4 WARNING

`age.log.Level.WARNING`

The documentation for this enum was generated from the following file:

- [D:/GIT/repos/ODE/age/age/log/Level.java](#)

## 6.19 age.log.Log Class Reference

### Public Member Functions

- void [clear](#) ()
- void [enable](#) ([Level](#) ... [levels](#))
- void [disable](#) ([Level](#) ... [levels](#))
- boolean [trace](#) ()
- void [trace](#) (boolean trace)
- String [format](#) ()
- void [format](#) (String format)

### Static Public Member Functions

- static void [configure](#) (String path)
- static [Log](#) [get](#) (String instance)
- static void [log](#) ([Level](#) level, String message, Object ... params)
- static void [info](#) (String message, Object ... params)
- static void [warn](#) (String message, Object ... params)
- static void [error](#) (String message, Object ... params)
- static void [debug](#) (String message, Object ... params)
- static void [log](#) (String instance, [Level](#) level, String message, Object ... params)
- static void [info](#) (String instance, String message, Object ... params)
- static void [warn](#) (String instance, String message, Object ... params)
- static void [error](#) (String instance, String message, Object ... params)
- static void [debug](#) (String instance, String message, Object ... params)

### Private Member Functions

- [Log](#) ()
- [Log](#) ([Log](#) parent)
- void [write](#) ([Level](#) level, String message, Object ... params)

### Private Attributes

- boolean [trace](#) = false
- Set< [Level](#) > [levels](#) = null
- String [format](#) = null



### Static Private Attributes

- static final Map< String, [Log](#) > [map](#) = new HashMap<>()

## 6.19.1 Constructor & Destructor Documentation

### 6.19.1.1 Log() [1/2]

```
age.log.Log.Log ( ) [private]
```

### 6.19.1.2 Log() [2/2]

```
age.log.Log.Log (
    Log parent ) [private]
```

## 6.19.2 Member Function Documentation

### 6.19.2.1 clear()

```
void age.log.Log.clear ( )
```

### 6.19.2.2 configure()

```
static void age.log.Log.configure (
    String path ) [static]
```

### 6.19.2.3 debug() [1/2]

```
static void age.log.Log.debug (
    String instance,
    String message,
    Object ... params ) [static]
```

### 6.19.2.4 debug() [2/2]

```
static void age.log.Log.debug (
    String message,
    Object ... params ) [static]
```

### 6.19.2.5 disable()

```
void age.log.Log.disable (
    Level ... levels )
```

#### 6.19.2.6 enable()

```
void age.log.Log.enable (
    Level ... levels )
```

#### 6.19.2.7 error() [1/2]

```
static void age.log.Log.error (
    String instance,
    String message,
    Object ... params ) [static]
```

#### 6.19.2.8 error() [2/2]

```
static void age.log.Log.error (
    String message,
    Object ... params ) [static]
```

#### 6.19.2.9 format() [1/2]

```
String age.log.Log.format ( )
```

#### 6.19.2.10 format() [2/2]

```
void age.log.Log.format (
    String format )
```

#### 6.19.2.11 get()

```
static Log age.log.Log.get (
    String instance ) [static]
```

#### 6.19.2.12 info() [1/2]

```
static void age.log.Log.info (
    String instance,
    String message,
    Object ... params ) [static]
```

#### 6.19.2.13 info() [2/2]

```
static void age.log.Log.info (
    String message,
    Object ... params ) [static]
```

**6.19.2.14 log() [1/2]**

```
static void age.log.Log.log (
    Level level,
    String message,
    Object ... params ) [static]
```

**6.19.2.15 log() [2/2]**

```
static void age.log.Log.log (
    String instance,
    Level level,
    String message,
    Object ... params ) [static]
```

**6.19.2.16 trace() [1/2]**

```
boolean age.log.Log.trace ( )
```

**6.19.2.17 trace() [2/2]**

```
void age.log.Log.trace (
    boolean trace )
```

**6.19.2.18 warn() [1/2]**

```
static void age.log.Log.warn (
    String instance,
    String message,
    Object ... params ) [static]
```

**6.19.2.19 warn() [2/2]**

```
static void age.log.Log.warn (
    String message,
    Object ... params ) [static]
```

**6.19.2.20 write()**

```
void age.log.Log.write (
    Level level,
    String message,
    Object ... params ) [private]
```

### 6.19.3 Member Data Documentation

#### 6.19.3.1 format

```
String age.log.Log.format = null [private]
```

#### 6.19.3.2 levels

```
Set<Level> age.log.Log.levels = null [private]
```

#### 6.19.3.3 map

```
final Map<String, Log> age.log.Log.map = new HashMap<>() [static], [private]
```

#### 6.19.3.4 trace

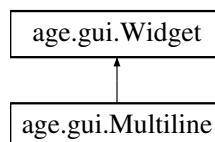
```
boolean age.log.Log.trace = false [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/log/Log.java](#)

## 6.20 age.gui.Multiline Class Reference

Inheritance diagram for age.gui.Multiline:



### Public Member Functions

- [Multiline](#) ()
- void [assign](#) (Tasks tasks)
- void [text](#) (String text)
- int [offset](#) ()
- void [up](#) ()
- void [down](#) ()
- void [offset](#) (int offset)
- int [count](#) ()
- int [page](#) ()
- int [lineHeight](#) ()
- CharSequence [line](#) (int idx)
- int[] [buffer](#) ()

## Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) ([Flag](#) ... [flags](#))
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- [Vector2f](#) [position](#) ()
- [Vector2f](#) [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) dock)
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) ([Vector2f](#) position)
- void [position](#) (float [x](#), float [y](#))
- void [positionAdd](#) ([Vector2f](#) [position](#))
- void [positionAdd](#) (float [x](#), float [y](#))
- void [dimension](#) ([Vector2f](#) dimension)
- void [dimension](#) (float [width](#), float [height](#))
- void [dimensionAdd](#) ([Vector2f](#) [dimension](#))
- void [dimensionAdd](#) (float [width](#), float [height](#))
- [Set](#)< [Flag](#) > [flags](#) ()
- void [flag](#) ([Flag](#) ... [flags](#))
- void [clear](#) ([Flag](#) ... [flags](#))
- boolean [match](#) ([Flag](#) ... [flags](#))
- [Widget](#) [parent](#) ()
- [List](#)< [Widget](#) > [children](#) ()
- void [add](#) ([Widget](#) child)
- void [add](#) (int idx, [Widget](#) child)
- void [remove](#) ()
- void [toFront](#) ()
- [String](#) [text](#) ()
- [String](#) [image](#) ()
- void [image](#) ([String](#) image)
- [String](#) [command](#) ()
- void [command](#) ([String](#) command)

## Private Member Functions

- void [create](#) ()

## Private Attributes

- int [offset](#)
- int[] [buffer](#) = new int[1024]
- [VScroller](#) [scroller](#)

## 6.20.1 Constructor & Destructor Documentation

### 6.20.1.1 Multiline()

```
age.gui.Multiline.Multiline ( )
```

## 6.20.2 Member Function Documentation

### 6.20.2.1 assign()

```
void age.gui.Multiline.assign (
    Tasks tasks )
```

### 6.20.2.2 buffer()

```
int[] age.gui.Multiline.buffer ( )
```

### 6.20.2.3 count()

```
int age.gui.Multiline.count ( )
```

### 6.20.2.4 create()

```
void age.gui.Multiline.create ( ) [private]
```

### 6.20.2.5 down()

```
void age.gui.Multiline.down ( )
```

### 6.20.2.6 line()

```
CharSequence age.gui.Multiline.line (
    int idx )
```

### 6.20.2.7 lineHeight()

```
int age.gui.Multiline.lineHeight ( )
```

### 6.20.2.8 offset() [1/2]

```
int age.gui.Multiline.offset ( )
```

### 6.20.2.9 offset() [2/2]

```
void age.gui.Multiline.offset (
    int offset )
```

### 6.20.2.10 page()

```
int age.gui.Multiline.page ( )
```

### 6.20.2.11 text()

```
void age.gui.Multiline.text (
    String text )
```

Reimplemented from [age.gui.Widget](#).

### 6.20.2.12 up()

```
void age.gui.Multiline.up ( )
```

## 6.20.3 Member Data Documentation

### 6.20.3.1 buffer

```
int [ ] age.gui.Multiline.buffer = new int[1024] [private]
```

### 6.20.3.2 offset

```
int age.gui.Multiline.offset [private]
```

### 6.20.3.3 scroller

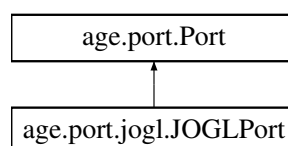
```
VScroller age.gui.Multiline.scroller [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/Multiline.java](#)

## 6.21 age.port.Port Interface Reference

Inheritance diagram for age.port.Port:



## Public Member Functions

- void [assign](#) (Events events)
- String [title](#) ()
- void [title](#) (String title)
- boolean [maximized](#) ()
- void [maximized](#) (boolean maximized)
- boolean [fullscreen](#) ()
- void [fullscreen](#) (boolean fullscreen)
- boolean [visible](#) ()
- void [visible](#) (boolean visible)
- float [width](#) ()
- float [height](#) ()
- void [size](#) (float [width](#), float [height](#))
- void [add](#) ([Renderable](#) renderable)
- void [create](#) ()
- void [render](#) ()

## 6.21.1 Member Function Documentation

### 6.21.1.1 [add\(\)](#)

```
void age.port.Port.add (  
    Renderable renderable )
```

Implemented in [age.port.jogl.JOGLPort](#).

### 6.21.1.2 [assign\(\)](#)

```
void age.port.Port.assign (  
    Events events )
```

Implemented in [age.port.jogl.JOGLPort](#).

### 6.21.1.3 [create\(\)](#)

```
void age.port.Port.create ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

### 6.21.1.4 [fullscreen\(\)](#) [1/2]

```
boolean age.port.Port.fullscreen ( )
```

Implemented in [age.port.jogl.JOGLPort](#).



**6.21.1.5 fullscreen()** [2/2]

```
void age.port.Port.fullscreen (
    boolean fullscreen )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.6 height()**

```
float age.port.Port.height ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.7 maximized()** [1/2]

```
boolean age.port.Port.maximized ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.8 maximized()** [2/2]

```
void age.port.Port.maximized (
    boolean maximized )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.9 render()**

```
void age.port.Port.render ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.10 size()**

```
void age.port.Port.size (
    float width,
    float height )
```

Implemented in [age.port.jogl.JOGLPort](#).

**6.21.1.11 title()** [1/2]

```
String age.port.Port.title ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

#### 6.21.1.12 title() [2/2]

```
void age.port.Port.title (
    String title )
```

Implemented in [age.port.jogl.JOGLPort](#).

#### 6.21.1.13 visible() [1/2]

```
boolean age.port.Port.visible ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

#### 6.21.1.14 visible() [2/2]

```
void age.port.Port.visible (
    boolean visible )
```

Implemented in [age.port.jogl.JOGLPort](#).

#### 6.21.1.15 width()

```
float age.port.Port.width ( )
```

Implemented in [age.port.jogl.JOGLPort](#).

The documentation for this interface was generated from the following file:

- D:/GIT/repos/ODE/age/age/port/[Port.java](#)

## 6.22 age.port.Renderable Interface Reference

### Public Member Functions

- void [render](#) ([Graphics](#) g)

### 6.22.1 Member Function Documentation

#### 6.22.1.1 render()

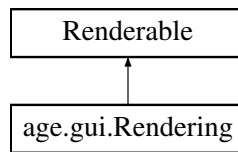
```
void age.port.Renderable.render (
    Graphics g )
```

The documentation for this interface was generated from the following file:

- D:/GIT/repos/ODE/age/age/port/[Renderable.java](#)

## 6.23 age.gui.Rendering Class Reference

Inheritance diagram for age.gui.Rendering:



### Public Member Functions

- [Rendering](#) ([Widgets](#) widgets)
- void [render](#) ([Graphics](#) g)

### Private Member Functions

- void [render](#) ([Graphics](#) g, [Widget](#) widget)
- void [renderWidget](#) ([Graphics](#) g, [Widget](#) widget)
- void [renderChildren](#) ([Graphics](#) g, List< [Widget](#) > children)

### Private Attributes

- final [Widgets](#) widgets

## 6.23.1 Constructor & Destructor Documentation

### 6.23.1.1 Rendering()

```
age.gui.Rendering.Rendering (
    Widgets widgets )
```

## 6.23.2 Member Function Documentation

### 6.23.2.1 render() [1/2]

```
void age.gui.Rendering.render (
    Graphics g )
```

### 6.23.2.2 render() [2/2]

```
void age.gui.Rendering.render (
    Graphics g,
    Widget widget ) [private]
```

### 6.23.2.3 renderChildren()

```
void age.gui.Rendering.renderChildren (
    Graphics g,
    List< Widget > children ) [private]
```

### 6.23.2.4 renderWidget()

```
void age.gui.Rendering.renderWidget (
    Graphics g,
    Widget widget ) [private]
```

## 6.23.3 Member Data Documentation

### 6.23.3.1 widgets

```
final Widgets age.gui.Rendering.widgets [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/gui/[Rendering.java](#)

## 6.24 age.clock.Task Interface Reference

### Public Member Functions

- void [run](#) (int count, long nanoperiod, float dT)

### 6.24.1 Member Function Documentation

#### 6.24.1.1 run()

```
void age.clock.Task.run (
    int count,
    long nanoperiod,
    float dT )
```

The documentation for this interface was generated from the following file:

- D:/GIT/repos/ODE/age/age/clock/[Task.java](#)

## 6.25 age.task.Task Interface Reference

### Public Member Functions

- void [perform](#) ()

## 6.25.1 Member Function Documentation

### 6.25.1.1 perform()

```
void age.task.Task.perform ( )
```

The documentation for this interface was generated from the following file:

- [D:/GIT/repos/ODE/age/age/task/Task.java](#)

## 6.26 age.task.Tasks Class Reference

### Public Member Functions

- void [assign](#) (Port [port](#))
- void [assign](#) (Client [client](#))
- void [assign](#) (Events events)
- [Tasks](#) ()
- void [put](#) (String command)
- void [assign](#) (String command, [Task](#) task)
- void [update](#) ()

### Private Member Functions

- void [handleEvent](#) (Event e)
- void [construct](#) ()
- void [perform](#) (String command)
- void [toggleFullscreen](#) ()
- void [shutdown](#) ()

### Private Attributes

- final List< String > [inbox](#) = new ArrayList<>()
- final List< String > [outbox](#) = new ArrayList<>()
- final Map< String, [Task](#) > [tasks](#) = new HashMap<>()
- Port [port](#)
- Client [client](#)

## 6.26.1 Constructor & Destructor Documentation

### 6.26.1.1 Tasks()

```
age.task.Tasks.Tasks ( )
```

## 6.26.2 Member Function Documentation

### 6.26.2.1 assign() [1/4]

```
void age.task.Tasks.assign (
    Client client )
```

### 6.26.2.2 assign() [2/4]

```
void age.task.Tasks.assign (
    Events events )
```

### 6.26.2.3 assign() [3/4]

```
void age.task.Tasks.assign (
    Port port )
```

### 6.26.2.4 assign() [4/4]

```
void age.task.Tasks.assign (
    String command,
    Task task )
```

### 6.26.2.5 construct()

```
void age.task.Tasks.construct ( ) [private]
```

### 6.26.2.6 handleEvent()

```
void age.task.Tasks.handleEvent (
    Event e ) [private]
```

### 6.26.2.7 perform()

```
void age.task.Tasks.perform (
    String command ) [private]
```

### 6.26.2.8 put()

```
void age.task.Tasks.put (
    String command )
```

### 6.26.2.9 shutdown()

```
void age.task.Tasks.shutdown ( ) [private]
```

### 6.26.2.10 toggleFullscreen()

```
void age.task.Tasks.toggleFullscreen ( ) [private]
```

### 6.26.2.11 update()

```
void age.task.Tasks.update ( )
```

## 6.26.3 Member Data Documentation

### 6.26.3.1 client

```
Client age.task.Tasks.client [private]
```

### 6.26.3.2 inbox

```
final List<String> age.task.Tasks.inbox = new ArrayList<>() [private]
```

### 6.26.3.3 outbox

```
final List<String> age.task.Tasks.outbox = new ArrayList<>() [private]
```

### 6.26.3.4 port

```
Port age.task.Tasks.port [private]
```

### 6.26.3.5 tasks

```
final Map<String, Task> age.task.Tasks.tasks = new HashMap<>() [private]
```

The documentation for this class was generated from the following file:

- <D:/GIT/repos/ODE/age/age/task/Tasks.java>

## 6.27 age.event.Type Enum Reference

### Public Attributes

- [NONE](#)
- [KEY\\_PRESSED](#)
- [KEY\\_RELEASED](#)
- [KEY\\_TYPED](#)
- [POINTER\\_ENTERED](#)
- [POINTER\\_EXITED](#)
- [POINTER\\_PRESSED](#)
- [POINTER\\_RELEASED](#)
- [POINTER\\_CLICKED](#)
- [POINTER\\_MOVED](#)
- [SURFACE\\_RESIZED](#)
- [SURFACE\\_CLOSE\\_REQUEST](#)
- [TASK\\_COMMAND](#)

### 6.27.1 Member Data Documentation

#### 6.27.1.1 KEY\_PRESSED

`age.event.Type.KEY_PRESSED`

#### 6.27.1.2 KEY\_RELEASED

`age.event.Type.KEY_RELEASED`

#### 6.27.1.3 KEY\_TYPED

`age.event.Type.KEY_TYPED`

#### 6.27.1.4 NONE

`age.event.Type.NONE`

#### 6.27.1.5 POINTER\_CLICKED

`age.event.Type.POINTER_CLICKED`

#### 6.27.1.6 POINTER\_ENTERED

`age.event.Type.POINTER_ENTERED`



### 6.27.1.7 POINTER\_EXITED

`age.event.Type.POINTER_EXITED`

### 6.27.1.8 POINTER\_MOVED

`age.event.Type.POINTER_MOVED`

### 6.27.1.9 POINTER\_PRESSED

`age.event.Type.POINTER_PRESSED`

### 6.27.1.10 POINTER\_RELEASED

`age.event.Type.POINTER_RELEASED`

### 6.27.1.11 SURFACE\_CLOSE\_REQUEST

`age.event.Type.SURFACE_CLOSE_REQUEST`

### 6.27.1.12 SURFACE\_RESIZED

`age.event.Type.SURFACE_RESIZED`

### 6.27.1.13 TASK\_COMMAND

`age.event.Type.TASK_COMMAND`

The documentation for this enum was generated from the following file:

- [D:/GIT/repos/ODE/age/age/event/Type.java](#)

## 6.28 age.Util Class Reference

### Static Public Member Functions

- static final String [readFile](#) (String path)

## 6.28.1 Member Function Documentation

### 6.28.1.1 readFile()

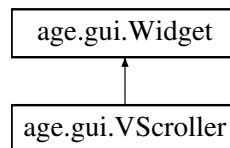
```
static final String age.Util.readFile (
    String path ) [static]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/Util.java](#)

## 6.29 age.gui.VScroller Class Reference

Inheritance diagram for age.gui.VScroller:



### Public Member Functions

- [VScroller](#) ()
- void [assign](#) (Tasks tasks, Task taskUp, Task taskDn)

### Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) (Flag ... flags)
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- Vector2f [position](#) ()
- Vector2f [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) dock)
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) (Vector2f position)
- void [position](#) (float x, float y)
- void [positionAdd](#) (Vector2f position)
- void [positionAdd](#) (float x, float y)
- void [dimension](#) (Vector2f dimension)
- void [dimension](#) (float width, float height)
- void [dimensionAdd](#) (Vector2f dimension)
- void [dimensionAdd](#) (float width, float height)
- Set< [Flag](#) > [flags](#) ()
- void [flag](#) (Flag ... flags)
- void [clear](#) (Flag ... flags)

- boolean `match` (Flag ... flags)
- `Widget parent` ()
- List< `Widget` > `children` ()
- void `add` (`Widget` child)
- void `add` (int idx, `Widget` child)
- void `remove` ()
- void `toFront` ()
- String `text` ()
- void `text` (String text)
- String `image` ()
- void `image` (String image)
- String `command` ()
- void `command` (String command)

### Private Member Functions

- void `create` ()

### Private Attributes

- `Widget btnUp`
- `Widget bar`
- `Widget btnDn`
- UUID `uuid` = UUID.randomUUID()

## 6.29.1 Constructor & Destructor Documentation

### 6.29.1.1 VScroller()

```
age.gui.VScroller.VScroller ( )
```

## 6.29.2 Member Function Documentation

### 6.29.2.1 assign()

```
void age.gui.VScroller.assign (
    Tasks tasks,
    Task taskUp,
    Task taskDn )
```

### 6.29.2.2 create()

```
void age.gui.VScroller.create ( ) [private]
```

### 6.29.3 Member Data Documentation

#### 6.29.3.1 bar

`Widget age.gui.VScroller.bar [private]`

#### 6.29.3.2 btnDn

`Widget age.gui.VScroller.btnDn [private]`

#### 6.29.3.3 btnUp

`Widget age.gui.VScroller.btnUp [private]`

#### 6.29.3.4 uuid

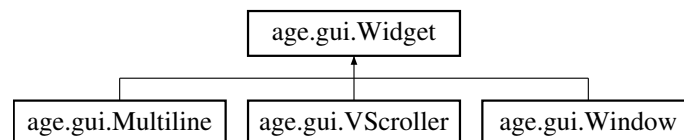
`UUID age.gui.VScroller.uuid = UUID.randomUUID() [private]`

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/VScroller.java](#)

## 6.30 age.gui.Widget Class Reference

Inheritance diagram for age.gui.Widget:



### Public Member Functions

- [Widget](#) ([Flag](#) ... [flags](#))
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- Vector2f [position](#) ()
- Vector2f [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) [dock](#))
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) (Vector2f position)
- void [position](#) (float [x](#), float [y](#))

- void `positionAdd` (Vector2f `position`)
- void `positionAdd` (float `x`, float `y`)
- void `dimension` (Vector2f `dimension`)
- void `dimension` (float `width`, float `height`)
- void `dimensionAdd` (Vector2f `dimension`)
- void `dimensionAdd` (float `width`, float `height`)
- Set< `Flag` > `flags` ()
- void `flag` (`Flag` ... `flags`)
- void `clear` (`Flag` ... `flags`)
- boolean `match` (`Flag` ... `flags`)
- `Widget` `parent` ()
- List< `Widget` > `children` ()
- void `add` (`Widget` `child`)
- void `add` (int `idx`, `Widget` `child`)
- void `remove` ()
- void `toFront` ()
- String `text` ()
- void `text` (String `text`)
- String `image` ()
- void `image` (String `image`)
- String `command` ()
- void `command` (String `command`)

### Private Member Functions

- void `resized` (float `dx`, float `dy`)
- void `parentResized` (float `dx`, float `dy`)

### Private Attributes

- final Set< `Flag` > `flags` = EnumSet.noneOf(`Flag`.class)
- final Set< `Flag` > `flags_ro` = Collections.unmodifiableSet(`flags`)
- final Vector2f `position` = new Vector2f()
- final Vector2f `dimension` = new Vector2f()
- final `Dock` `dock` = new `Dock`()
- `Widget` `parent` = null
- final List< `Widget` > `children` = new ArrayList<>(10)
- final List< `Widget` > `children_ro` = Collections.unmodifiableList(`children`)
- String `text` = null
- String `image` = null
- String `command` = null

## 6.30.1 Constructor & Destructor Documentation

### 6.30.1.1 Widget()

```
age.gui.Widget.Widget (
    Flag ... flags )
```

## 6.30.2 Member Function Documentation

### 6.30.2.1 add() [1/2]

```
void age.gui.Widget.add (
    int idx,
    Widget child )
```

### 6.30.2.2 add() [2/2]

```
void age.gui.Widget.add (
    Widget child )
```

### 6.30.2.3 children()

```
List< Widget > age.gui.Widget.children ( )
```

### 6.30.2.4 clear()

```
void age.gui.Widget.clear (
    Flag ... flags )
```

### 6.30.2.5 command() [1/2]

```
String age.gui.Widget.command ( )
```

### 6.30.2.6 command() [2/2]

```
void age.gui.Widget.command (
    String command )
```

### 6.30.2.7 dimension() [1/3]

```
Vector2f age.gui.Widget.dimension ( )
```

### 6.30.2.8 dimension() [2/3]

```
void age.gui.Widget.dimension (
    float width,
    float height )
```

**6.30.2.9 dimension()** [3/3]

```
void age.gui.Widget.dimension (
    Vector2f dimension )
```

**6.30.2.10 dimensionAdd()** [1/2]

```
void age.gui.Widget.dimensionAdd (
    float width,
    float height )
```

**6.30.2.11 dimensionAdd()** [2/2]

```
void age.gui.Widget.dimensionAdd (
    Vector2f dimension )
```

**6.30.2.12 dock()** [1/3]

```
Dock age.gui.Widget.dock ( )
```

**6.30.2.13 dock()** [2/3]

```
void age.gui.Widget.dock (
    Dock dock )
```

**6.30.2.14 dock()** [3/3]

```
void age.gui.Widget.dock (
    float top,
    float bottom,
    float left,
    float right )
```

**6.30.2.15 flag()**

```
void age.gui.Widget.flag (
    Flag ... flags )
```

**6.30.2.16 flags()**

```
Set< Flag > age.gui.Widget.flags ( )
```

**6.30.2.17 height()**

```
float age.gui.Widget.height ( )
```

**6.30.2.18 image() [1/2]**

```
String age.gui.Widget.image ( )
```

**6.30.2.19 image() [2/2]**

```
void age.gui.Widget.image (
    String image )
```

**6.30.2.20 match()**

```
boolean age.gui.Widget.match (
    Flag ... flags )
```

**6.30.2.21 parent()**

```
Widget age.gui.Widget.parent ( )
```

**6.30.2.22 parentResized()**

```
void age.gui.Widget.parentResized (
    float dx,
    float dy ) [private]
```

**6.30.2.23 position() [1/3]**

```
Vector2f age.gui.Widget.position ( )
```

**6.30.2.24 position() [2/3]**

```
void age.gui.Widget.position (
    float x,
    float y )
```

**6.30.2.25 position() [3/3]**

```
void age.gui.Widget.position (
    Vector2f position )
```

**6.30.2.26 positionAdd() [1/2]**

```
void age.gui.Widget.positionAdd (
    float x,
    float y )
```



**6.30.2.27 positionAdd()** [2/2]

```
void age.gui.Widget.positionAdd (
    Vector2f position )
```

**6.30.2.28 remove()**

```
void age.gui.Widget.remove ( )
```

**6.30.2.29 resized()**

```
void age.gui.Widget.resized (
    float dx,
    float dy ) [private]
```

**6.30.2.30 text()** [1/2]

```
String age.gui.Widget.text ( )
```

**6.30.2.31 text()** [2/2]

```
void age.gui.Widget.text (
    String text )
```

Reimplemented in [age.gui.Multiline](#).

**6.30.2.32 toFront()**

```
void age.gui.Widget.toFront ( )
```

**6.30.2.33 width()**

```
float age.gui.Widget.width ( )
```

**6.30.2.34 x()**

```
float age.gui.Widget.x ( )
```

**6.30.2.35 y()**

```
float age.gui.Widget.y ( )
```

### 6.30.3 Member Data Documentation

#### 6.30.3.1 children

```
final List<Widget> age.gui.Widget.children = new ArrayList<>(10) [private]
```

#### 6.30.3.2 children\_ro

```
final List<Widget> age.gui.Widget.children_ro = Collections.unmodifiableList(children) [private]
```

#### 6.30.3.3 command

```
String age.gui.Widget.command = null [private]
```

#### 6.30.3.4 dimension

```
final Vector2f age.gui.Widget.dimension = new Vector2f() [private]
```

#### 6.30.3.5 dock

```
final Dock age.gui.Widget.dock = new Dock() [private]
```

#### 6.30.3.6 flags

```
final Set<Flag> age.gui.Widget.flags = EnumSet.noneOf(Flag.class) [private]
```

#### 6.30.3.7 flags\_ro

```
final Set<Flag> age.gui.Widget.flags_ro = Collections.unmodifiableSet(flags) [private]
```

#### 6.30.3.8 image

```
String age.gui.Widget.image = null [private]
```

#### 6.30.3.9 parent

```
Widget age.gui.Widget.parent = null [private]
```

#### 6.30.3.10 position

```
final Vector2f age.gui.Widget.position = new Vector2f() [private]
```

### 6.30.3.11 text

```
String age.gui.Widget.text = null [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/Widget.java](#)

## 6.31 age.gui.Widgets Class Reference

### Public Member Functions

- [Widgets](#) ()
- void [assign](#) (Port port)
- void [assign](#) (Events events)
- [Widget root](#) ()

### Private Attributes

- [Widget root](#) = new [Widget](#)()
- [Handling handling](#) = new [Handling](#)(this)
- [Rendering rendering](#) = new [Rendering](#)(this)

## 6.31.1 Constructor & Destructor Documentation

### 6.31.1.1 Widgets()

```
age.gui.Widgets.Widgets ( )
```

## 6.31.2 Member Function Documentation

### 6.31.2.1 assign() [1/2]

```
void age.gui.Widgets.assign (
    Events events )
```

### 6.31.2.2 assign() [2/2]

```
void age.gui.Widgets.assign (
    Port port )
```

### 6.31.2.3 root()

```
Widget age.gui.Widgets.root ( )
```

### 6.31.3 Member Data Documentation

#### 6.31.3.1 handling

```
Handling age.gui.Widgets.handling = new Handling(this) [private]
```

#### 6.31.3.2 rendering

```
Rendering age.gui.Widgets.rendering = new Rendering(this) [private]
```

#### 6.31.3.3 root

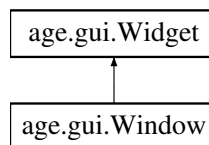
```
Widget age.gui.Widgets.root = new Widget() [private]
```

The documentation for this class was generated from the following file:

- [D:/GIT/repos/ODE/age/age/gui/Widgets.java](#)

## 6.32 age.gui.Window Class Reference

Inheritance diagram for age.gui.Window:



### Public Member Functions

- [Window](#) (Flag ... flags)
- String [title](#) ()
- void [title](#) (String title)
- [Widget](#) [getPage](#) ()

## Public Member Functions inherited from [age.gui.Widget](#)

- [Widget](#) ([Flag](#) ... [flags](#))
- float [x](#) ()
- float [y](#) ()
- float [width](#) ()
- float [height](#) ()
- [Vector2f](#) [position](#) ()
- [Vector2f](#) [dimension](#) ()
- [Dock](#) [dock](#) ()
- void [dock](#) ([Dock](#) dock)
- void [dock](#) (float top, float bottom, float left, float right)
- void [position](#) ([Vector2f](#) position)
- void [position](#) (float [x](#), float [y](#))
- void [positionAdd](#) ([Vector2f](#) [position](#))
- void [positionAdd](#) (float [x](#), float [y](#))
- void [dimension](#) ([Vector2f](#) dimension)
- void [dimension](#) (float [width](#), float [height](#))
- void [dimensionAdd](#) ([Vector2f](#) [dimension](#))
- void [dimensionAdd](#) (float [width](#), float [height](#))
- [Set](#)< [Flag](#) > [flags](#) ()
- void [flag](#) ([Flag](#) ... [flags](#))
- void [clear](#) ([Flag](#) ... [flags](#))
- boolean [match](#) ([Flag](#) ... [flags](#))
- [Widget](#) [parent](#) ()
- [List](#)< [Widget](#) > [children](#) ()
- void [add](#) ([Widget](#) child)
- void [add](#) (int idx, [Widget](#) child)
- void [remove](#) ()
- void [toFront](#) ()
- [String](#) [text](#) ()
- void [text](#) ([String](#) text)
- [String](#) [image](#) ()
- void [image](#) ([String](#) image)
- [String](#) [command](#) ()
- void [command](#) ([String](#) command)

## Private Member Functions

- void [construct](#) ()

## Private Attributes

- [Widget](#) [title](#) = new [Widget](#)()
- [Widget](#) [size](#) = new [Widget](#)()
- [Widget](#) [close](#) = new [Widget](#)()
- [Widget](#) [page](#) = new [Widget](#)()

## 6.32.1 Constructor & Destructor Documentation

### 6.32.1.1 Window()

```
age.gui.Window.Window (
    Flag ... flags )
```

## 6.32.2 Member Function Documentation

### 6.32.2.1 construct()

```
void age.gui.Window.construct ( ) [private]
```

### 6.32.2.2 getPage()

```
Widget age.gui.Window.getPage ( )
```

### 6.32.2.3 title() [1/2]

```
String age.gui.Window.title ( )
```

### 6.32.2.4 title() [2/2]

```
void age.gui.Window.title (
    String title )
```

## 6.32.3 Member Data Documentation

### 6.32.3.1 close

```
Widget age.gui.Window.close = new Widget() [private]
```

### 6.32.3.2 page

```
Widget age.gui.Window.page = new Widget() [private]
```

### 6.32.3.3 size

```
Widget age.gui.Window.size = new Widget() [private]
```

### 6.32.3.4 title

```
Widget age.gui.Window.title = new Widget() [private]
```

The documentation for this class was generated from the following file:

- D:/GIT/repos/ODE/age/age/gui/[Window.java](#)

## Chapter 7

# File Documentation

### 7.1 D:/GIT/repos/ODE/age/age/AGEException.java File Reference

#### Classes

- class [age.AGEException](#)

#### Packages

- package [age](#)

### 7.2 D:/GIT/repos/ODE/age/age/Client.java File Reference

```
import age.port.Port;
```

#### Classes

- class [age.Client](#)

#### Packages

- package [age](#)

### 7.3 D:/GIT/repos/ODE/age/age/clock/Alarm.java File Reference

#### Classes

- class [age.clock.Alarm](#)

### Packages

- package [age.clock](#)

## 7.4 D:/GIT/repos/ODE/age/age/clock/Clock.java File Reference

```
import java.util.ArrayList;
```

### Classes

- class [age.clock.Clock](#)

### Packages

- package [age.clock](#)

## 7.5 D:/GIT/repos/ODE/age/age/clock/Task.java File Reference

### Classes

- interface [age.clock.Task](#)

### Packages

- package [age.clock](#)

## 7.6 D:/GIT/repos/ODE/age/age/task/Task.java File Reference

### Classes

- interface [age.task.Task](#)

### Packages

- package [age.task](#)

## 7.7 D:/GIT/repos/ODE/age/age/event/Button.java File Reference

### Classes

- enum [age.event.Button](#)



**Packages**

- package [age.event](#)

## 7.8 D:/GIT/repos/ODE/age/age/event/Event.java File Reference

```
import javax.vecmath.Vector2f;
```

**Classes**

- class [age.event.Event](#)

**Packages**

- package [age.event](#)

## 7.9 D:/GIT/repos/ODE/age/age/event/Events.java File Reference

```
import java.util.ArrayList;
```

**Classes**

- class [age.event.Events](#)

**Packages**

- package [age.event](#)

## 7.10 D:/GIT/repos/ODE/age/age/event/Handler.java File Reference

**Classes**

- interface [age.event.Handler](#)

**Packages**

- package [age.event](#)

## 7.11 D:/GIT/repos/ODE/age/age/event/Key.java File Reference

### Classes

- enum [age.event.Key](#)

### Packages

- package [age.event](#)

## 7.12 D:/GIT/repos/ODE/age/age/event/Type.java File Reference

### Classes

- enum [age.event.Type](#)

### Packages

- package [age.event](#)

## 7.13 D:/GIT/repos/ODE/age/age/gui/Dock.java File Reference

### Classes

- class [age.gui.Dock](#)

### Packages

- package [age.gui](#)

## 7.14 D:/GIT/repos/ODE/age/age/gui/Flag.java File Reference

### Classes

- enum [age.gui.Flag](#)

### Packages

- package [age.gui](#)

## 7.15 D:/GIT/repos/ODE/age/age/gui/Handling.java File Reference

```
import java.util.ArrayList;
```

### Classes

- class [age.gui.Handling](#)

### Packages

- package [age.gui](#)

## 7.16 D:/GIT/repos/ODE/age/age/gui/Multiline.java File Reference

```
import age.task.Tasks;
```

### Classes

- class [age.gui.Multiline](#)

### Packages

- package [age.gui](#)

## 7.17 D:/GIT/repos/ODE/age/age/gui/Rendering.java File Reference

```
import java.util.List;
```

### Classes

- class [age.gui.Rendering](#)

### Packages

- package [age.gui](#)

## 7.18 D:/GIT/repos/ODE/age/age/gui/VScroller.java File Reference

```
import java.util.UUID;
```

**Classes**

- class [age.gui.VScroller](#)

**Packages**

- package [age.gui](#)

## 7.19 D:/GIT/repos/ODE/age/age/gui/Widget.java File Reference

```
import java.util.ArrayList;
```

**Classes**

- class [age.gui.Widget](#)

**Packages**

- package [age.gui](#)

## 7.20 D:/GIT/repos/ODE/age/age/gui/Widgets.java File Reference

```
import age.event.Events;
```

**Classes**

- class [age.gui.Widgets](#)

**Packages**

- package [age.gui](#)

## 7.21 D:/GIT/repos/ODE/age/age/gui/Window.java File Reference

**Classes**

- class [age.gui.Window](#)

**Packages**

- package [age.gui](#)

## 7.22 D:/GIT/repos/ODE/age/age/log/Level.java File Reference

### Classes

- enum [age.log.Level](#)

### Packages

- package [age.log](#)

## 7.23 D:/GIT/repos/ODE/age/age/log/Log.java File Reference

```
import java.io.File;
```

### Classes

- class [age.log.Log](#)

### Packages

- package [age.log](#)

## 7.24 D:/GIT/repos/ODE/age/age/port/Graphics.java File Reference

```
import javax.vecmath.Color4f;
```

### Classes

- interface [age.port.Graphics](#)

### Packages

- package [age.port](#)

## 7.25 D:/GIT/repos/ODE/age/age/port/jogl/JOGLEventListener.java File Reference

```
import com.jogamp.newt.Window;
```

### Classes

- class [age.port.jogl.JOGLEventListener](#)

### Packages

- package [age.port.jogl](#)

## 7.26 D:/GIT/repos/ODE/age/age/port/jogl/JOGLGraphics.java File Reference

```
import com.jogamp.opengl.GL2;
```

### Classes

- class [age.port.jogl.JOGLGraphics](#)

### Packages

- package [age.port.jogl](#)

## 7.27 D:/GIT/repos/ODE/age/age/port/jogl/JOGLPort.java File Reference

```
import java.util.ArrayList;
```

### Classes

- class [age.port.jogl.JOGLPort](#)

### Packages

- package [age.port.jogl](#)

## 7.28 D:/GIT/repos/ODE/age/age/port/jogl/JOGLRenderListener.java File Reference

```
import com.jogamp.opengl.GLAutoDrawable;
```

**Classes**

- class [age.port.jogl.JOGLRenderListener](#)

**Packages**

- package [age.port.jogl](#)

## 7.29 D:/GIT/repos/ODE/age/age/port/Port.java File Reference

```
import age.event.Events;
```

**Classes**

- interface [age.port.Port](#)

**Packages**

- package [age.port](#)

## 7.30 D:/GIT/repos/ODE/age/age/port/Renderable.java File Reference

**Classes**

- interface [age.port.Renderable](#)

**Packages**

- package [age.port](#)

## 7.31 D:/GIT/repos/ODE/age/age/task/Tasks.java File Reference

```
import java.util.ArrayList;
```

**Classes**

- class [age.task.Tasks](#)

**Packages**

- package [age.task](#)

## 7.32 D:/GIT/repos/ODE/age/age/Util.java File Reference

```
import java.io.BufferedReader;
```

### Classes

- class [age.Util](#)

### Packages

- package [age](#)



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