

ODE Framework

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Class Index

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age.gui.Handling	38
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File Index

4.1 File List

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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](#)
Root Exception for AGE.
- class [Client](#)
The AGE Application Client main class.
- class [Util](#)
The AGE Utility class.

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](#)

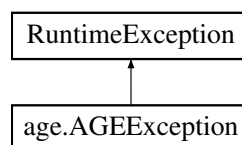
Chapter 6

Class Documentation

6.1 age.AGEEException Class Reference

Root Exception for AGE.

Inheritance diagram for age.AGEEException:



Public Member Functions

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

Static Private Attributes

- static final long [serialVersionUID](#) = 1L
Default serial version number.

6.1.1 Detailed Description

Root Exception for AGE.

The `AGEEException` is derived from `Runtime Exception` which means that no throws declarations have to be added to surrounding methods.

Exceptions of local try/catch blocks commonly are re-thrown by that Exception in order to make throws statements unnecessary.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 AGEException() [1/4]

```
age.AGEException.AGEException ( )
```

Default Constructor.

6.1.2.2 AGEException() [2/4]

```
age.AGEException.AGEException (
    Throwable cause )
```

Constructor.

Parameters

<i>cause</i>	an Exception typically to be re-thrown.
--------------	---

6.1.2.3 AGEException() [3/4]

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

Constructor.

Parameters

<i>message</i>	A text message that is printed on the stack trace in case the Exception is thrown on application level.
----------------	---

6.1.2.4 AGEException() [4/4]

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

Constructor.

Parameters

<i>message</i>	A text message that is printed on the stack trace in case the Exception is thrown on application level.
<i>cause</i>	an Exception typically to be re-thrown.

6.1.3 Member Data Documentation

6.1.3.1 serialVersionUID

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

Default serial version number.

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

The AGE Application Client main class.

Public Member Functions

- void `run` ()
Initializes and executes the Client run loop.
- void `shutdown` ()
Sets the internal Client loop run state to false, and therefore stops the client run loop.

Static Public Member Functions

- static void `main` (String[] args)
The static Client main method to create a client instance and launch the application.

Private Member Functions

- void `setup` ()
Initializes the client application and its parts.
- void `setupGUI` ()
Initializes and sets up the GUI elements.
- void `toggleSystemenu` ()
Private action method to toggle the visibility of the System Menu.
- void `toggleDesktop` ()
Private action method to toggle the visibility of the Desktop and its contents.
- void `loop` ()
The Client loop that maintains the program logic.
- void `render` (int count, long nanoperiod, float dT)
Private scheduler action to update the display contents and render the Client surface.
- void `update` (int count, long nanoperiod, float dT)
Private scheduler action to update the logic of the Client application.

Private Attributes

- Clock `clock` = new Clock()
The schedule clock.
- Events `events` = new Events()
The event system, handling and transforming input events.
- Widgets `widgets` = new Widgets()
The widget system (the GUI)
- Tasks `tasks` = new Tasks()
The task system.
- Port `port` = new JOGLPort()
The port system.
- boolean `running` = false
The run loop running indicator.
- Widget `sysMenuFrame`
- Widget `windowFrame`

6.4.1 Detailed Description

The AGE Application Client main class.

6.4.2 Member Function Documentation

6.4.2.1 loop()

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

The Client loop that maintains the program logic.

6.4.2.2 main()

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

The static Client main method to create a client instance and launch the application.

Parameters

<i>args</i>	Program arguments, unused atm.
-------------	--------------------------------

6.4.2.3 render()

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

Private scheduler action to update the display contents and render the Client surface.

Parameters

<i>count</i>	The number of (skipped) schedule frames since last call
<i>nanoperiod</i>	The duration of a schedule frame in nano seconds
<i>dT</i>	The time elapsed since last schedule call, in Seconds.

6.4.2.4 run()

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

Initializes and executes the Client run loop.

6.4.2.5 setup()

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

Initializes the client application and its parts.

6.4.2.6 setupGUI()

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

Initializes and sets up the GUI elements.

6.4.2.7 shutdown()

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

Sets the internal Client loop run state to false, and therefore stops the client run loop.

6.4.2.8 toggleDesktop()

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

Private action method to toggle the visibility of the Desktop and its contents.

6.4.2.9 toggleSysmenu()

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

Private action method to toggle the visibility of the System Menu.

6.4.2.10 update()

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

Private scheduler action to update the logic of the Client application.

Parameters

<i>count</i>	The number of (skipped) schedule frames since last call
<i>nanoperiod</i>	The duration of a schedule frame in nano seconds
<i>dT</i>	The time elapsed since last schedule call, in Seconds.

6.4.3 Member Data Documentation

6.4.3.1 clock

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

The schedule clock.

6.4.3.2 events

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

The event system, handling and transforming input events.

6.4.3.3 port

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

The port system.

Provides and encapsulates the low level machine dependent parts of the Client application.

6.4.3.4 running

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

The run loop running indicator.

6.4.3.5 sysMenuFrame

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

6.4.3.6 tasks

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

The task system.

Launches named tasks, that can be posted and queued, on a specific run loop phase.

6.4.3.7 widgets

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

The widget system (the GUI)

6.4.3.8 windowFrame

```
Widget age.Client.windowFrame [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](#)
- [HANDLE](#)
- [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 HANDLE

`age.gui.Flag.HANDLE`

6.9.1.6 HIDDEN

`age.gui.Flag.HIDDEN`

6.9.1.7 HOVERED

`age.gui.Flag.HOVERED`

6.9.1.8 MULTILINE

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

6.9.1.9 TITLE

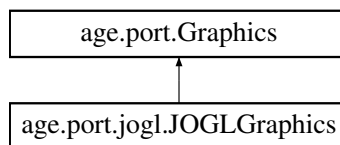
```
age.gui.Flag.TITLE
```

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 [startScrollHandleAction](#) (Event e)
- void [updateActionState](#) (Event e, String [action](#))
- void [updateDragAction](#) (Event e)
- void [stopDragAction](#) (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 startScrollHandleAction()

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

6.12.2.11 stopDragAction()

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

6.12.2.12 updateActionState()

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

6.12.2.13 updateDragAction()

```
void age.gui.Handling.updateDragAction (
    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

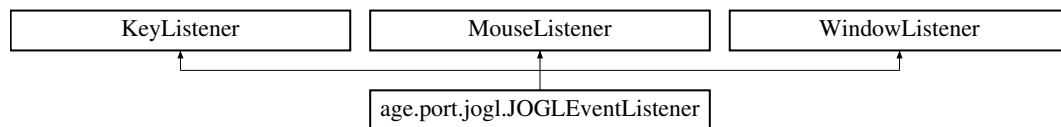
```
final Widgets age.gui.Handling.widgets [private]
```

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

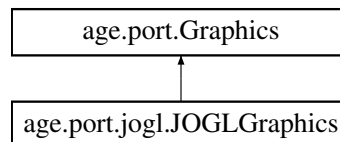
```
Events age.port.jogl.JOGLEventListener.events = null [private]
```

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

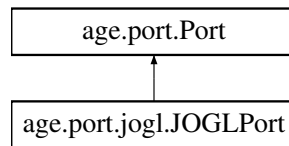
```
Map<String, Texture> age.port.jogl.JOGLGraphics.textures = new HashMap<>() [private]
```

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

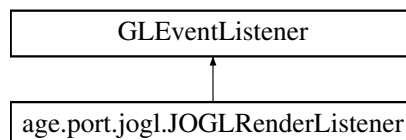
```
GLWindow age.port.jogl.JOGLPort.window = null [private]
```

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

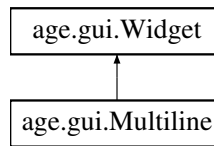
```
boolean age.log.Log.trace = false [private]
```

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](#) ()
- void [rescale](#) (float dy)
- void [update](#) ()

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 rescale()

```
void age.gui.Multiline.rescale (
    float dy )
```

6.20.2.12 text()

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

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

6.20.2.13 up()

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

6.20.2.14 update()

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

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

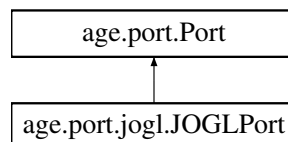
```
VScroller age.gui.Multiline.scroller [private]
```

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()

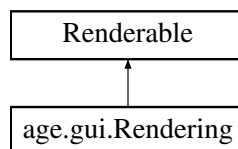
```
void age.port.Renderable.render (
    Graphics g )
```

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

The AGE Utility class.

Static Public Member Functions

- static final String [readFile](#) (String path)
Static utility method to load and return text read from a file located by path.

6.28.1 Detailed Description

The AGE Utility class.

6.28.2 Member Function Documentation

6.28.2.1 readFile()

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

Static utility method to load and return text read from a file located by path.

Parameters

<i>path</i>	The file path String of the file to be read
-------------	---

Returns

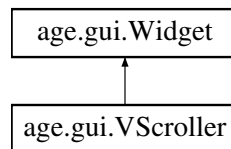
The file contents as a text String

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)
- void [set](#) (int [size](#), int [page](#), int [mark](#))
- void [value](#) (int [mark](#))
- [Widget](#) [handle](#) ()

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](#) [handle](#)
- [Widget](#) [btnDn](#)
- [UUID](#) [uuid](#) = [UUID.randomUUID\(\)](#)
- [int](#) [size](#)
- [int](#) [page](#)
- [int](#) [mark](#)

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]
```

6.29.2.3 handle()

```
Widget age.gui.VScroller.handle ( )
```

6.29.2.4 set()

```
void age.gui.VScroller.set (
    int size,
    int page,
    int mark )
```


6.29.2.5 value()

```
void age.gui.VScroller.value (
    int mark )
```

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 handle

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

6.29.3.5 mark

```
int age.gui.VScroller.mark [private]
```

6.29.3.6 page

```
int age.gui.VScroller.page [private]
```

6.29.3.7 size

```
int age.gui.VScroller.size [private]
```

6.29.3.8 uuid

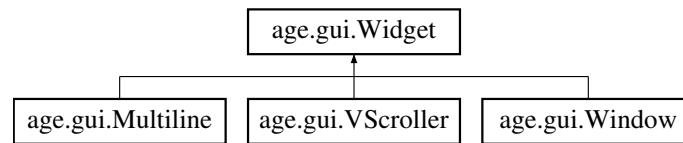
```
UUID age.gui.VScroller.uuid = UUID.randomUUID() [private]
```

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

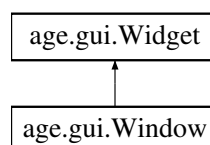
```
Widget age.gui.Widgets.root = new Widget() [private]
```

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](#)
Root Exception for AGE.

Packages

- package [age](#)

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

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

Classes

- class [age.Client](#)
The AGE Application Client main class.

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](#)
The AGE Utility class.

Packages

- package [age](#)

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