

# pystroke

## API Documentation

January 15, 2013

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# 1 Package pystroke

## 1.1 Modules

- **behaviour** (*Section 2, p. 4*)
- **behaviour\_engine** (*Section 3, p. 5*)
- **draw\_engine** (*Section 4, p. 6*)
- **event\_engine** (*Section 5, p. 12*)
- **game** (*Section 6, p. 18*)
- **game\_engine** (*Section 7, p. 19*)
- **hud** (*Section 8, p. 26*)
- **input\_engine** (*Section 9, p. 36*)
- **locals** (*Section 10, p. 43*)
- **vector2** (*Section 11, p. 44*)
- **vex** (*Section 12, p. 49*)

## 1.2 Variables

Name	Description
<code>__package__</code>	<b>Value:</b> None

## 2 Module *pystroke.behaviour*

### 2.1 Variables

Name	Description
<code>__package__</code>	<b>Value:</b> 'pystroke'

### 2.2 Class Behaviour

Stores a modular behaviour that can be added to a game entity

**Author:** James Heslin (PROGRAM\_IX)

#### 2.2.1 Methods

<b><code>__init__(self, name)</code></b> <hr/> Creates a new Behaviour <b>Parameters</b> <b>name:</b> The name of the Behaviour ( <i>type=string</i> ) <b>Author:</b> James Heslin (PROGRAM_IX)
<b><code>process(self, entity)</code></b> <hr/> Performs the operations making up the Behaviour on the game entity <b>Parameters</b> <b>entity:</b> The game entity affected by the Behaviour ( <i>type=Vex</i> ) <b>Author:</b> James Heslin (PROGRAM_IX)

### 3 Module *pystroke.behaviour\_engine*

#### 3.1 Variables

Name	Description
<code>__package__</code>	<b>Value:</b> 'pystroke'

#### 3.2 Class *BehaviourEngine*

Processes all behaviours in `beh_dict` when `update()` is called

**Author:** James Heslin (PROGRAM\_IX)

##### 3.2.1 Methods

<code>__init__(self, beh_dict={})</code>
Construct a new <i>BehaviourEngine</i> with a list of Behaviours
<b>Parameters</b>
<code>beh_dict</code> : The list of Behaviours this <i>BehaviourEngine</i> will use ( <i>type=</i> <code>dict (Behaviour)</code> )
<b>Author:</b> James Heslin (PROGRAM_IX)

<code>update(self)</code>
Process all behaviours in <code>beh_dict</code>
<b>Author:</b> James Heslin (PROGRAM_IX)

## 4 Module `pystroke.draw_engine`

### 4.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

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Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

*continued on next page*

Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

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Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

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Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

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Name	Description
SRCALPHA	Value: 65536
SRCCOLORKEY	Value: 4096
SWSURFACE	Value: 0
SYSWMEVENT	Value: 13
TIMER_RESOLUTION	Value: 10
USEREVENT	Value: 24
UYVY_OVERLAY	Value: 1498831189
VIDEOEXPOSE	Value: 17
VIDEORESIZE	Value: 16
YUY2_OVERLAY	Value: 844715353
YV12_OVERLAY	Value: 842094169
YVYU_OVERLAY	Value: 1431918169
__package__	Value: 'pystroke'

## 4.2 Class DrawEngine

Abstracts the calls to Vex.draw() and other drawing methods

**Author:** James Heslin (PROGRAM\_IX)

### 4.2.1 Methods

<b>__init__</b> ( <i>self</i> , <i>screen</i> )
<b>draw</b> ( <i>self</i> , <i>drawables</i> ) <hr/> Presumes everything in the drawables list has a draw() method, and draws all of them to screen. <b>Parameters</b> <i>drawables</i> : The list of objects to draw (all must have a draw() method) <i>(type=list)</i> <b>Author:</b> James Heslin (PROGRAM_IX)
<b>begin_draw</b> ( <i>self</i> , <i>colour</i> ) <hr/> Clears the screen to prepare for drawing <b>Parameters</b> <i>colour</i> : The colour to fill the screen with <i>(type=pygame.Color)</i> <b>Author:</b> James Heslin (PROGRAM_IX)
<b>end_draw</b> ( <i>self</i> ) <hr/> Updates the screen after draws have finished <b>Author:</b> James Heslin (PROGRAM_IX)

## 5 Module `pystroke.event_engine`

### 5.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

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Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

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Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

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Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

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Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

*continued on next page*



Name	Description
SRCALPHA	<b>Value:</b> 65536
SRCCOLORKEY	<b>Value:</b> 4096
SWSURFACE	<b>Value:</b> 0
SYSWMEVENT	<b>Value:</b> 13
TIMER_RESOLUTION	<b>Value:</b> 10
USEREVENT	<b>Value:</b> 24
UYVY_OVERLAY	<b>Value:</b> 1498831189
VIDEOEXPOSE	<b>Value:</b> 17
VIDEORESIZE	<b>Value:</b> 16
YUY2_OVERLAY	<b>Value:</b> 844715353
YV12_OVERLAY	<b>Value:</b> 842094169
YVYU_OVERLAY	<b>Value:</b> 1431918169
__package__	<b>Value:</b> 'pystroke'

## 5.2 Class EventEngine

Reads the event queue and passes events to other engines

**Author:** James Heslin (PROGRAM\_IX)

### 5.2.1 Methods

<b>__init__</b> ( <i>self</i> , <i>i_e</i> ) <hr/> Takes an InputEngine and passes all relevant events to it <b>Parameters</b> <i>i_e</i> : InputEngine to which input events should be passed ( <i>type=InputEngine</i> ) <b>Author:</b> James Heslin (PROGRAM_IX)
<b>update</b> ( <i>self</i> ) <hr/> Pulls all relevant events from the event queue and passes them to the appropriate engines <b>Author:</b> James Heslin (PROGRAM_IX)
<b>reset_input</b> ( <i>self</i> ) <hr/> Resets the InputEngine's values <b>Author:</b> James Heslin (PROGRAM_IX)
<b>print_input_states</b> ( <i>self</i> ) <hr/> Prints the states of the InputEngine <b>Author:</b> James Heslin (PROGRAM_IX)

## 6 Module `pystroke.game`

### 6.1 Functions

<b>main()</b>
Default running parameters for Game
<b>Author:</b> James Heslin (PROGRAM_IX)

### 6.2 Variables

Name	Description
<code>__package__</code>	<b>Value:</b> 'pystroke'

### 6.3 Class *Game*

Container and manager for *GameEngine* instances

**Author:** James Heslin (PROGRAM\_IX)

#### 6.3.1 Methods

<b>__init__</b> ( <i>self</i> , <i>width</i> , <i>height</i> )
Constructs a new <i>Game</i> , whose screen has the specified width and height
<b>Parameters</b>
<b>width:</b> Width of the screen ( <i>type=int</i> )
<b>height:</b> Height of the screen ( <i>type=int</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>start</b> ( <i>self</i> )
Set up the <i>GameEngine</i> and run the game
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>run</b> ( <i>self</i> )
Runs the <i>GameEngine</i> , switches to another <i>GameEngine</i> , or quits, based on returned flags from <i>GameEngine</i>
<b>Author:</b> James Heslin (PROGRAM_IX)

## 7 Module `pystroke.game_engine`

### 7.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

*continued on next page*

Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

*continued on next page*

Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

*continued on next page*

Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

*continued on next page*

Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

*continued on next page*

Name	Description
SRCALPHA	Value: 65536
SRCCOLORKEY	Value: 4096
SWSURFACE	Value: 0
SYSWMEVENT	Value: 13
TIMER_RESOLUTION	Value: 10
USEREVENT	Value: 24
UYVY_OVERLAY	Value: 1498831189
VIDEOEXPOSE	Value: 17
VIDEORESIZE	Value: 16
YUY2_OVERLAY	Value: 844715353
YV12_OVERLAY	Value: 842094169
YVYU_OVERLAY	Value: 1431918169
__package__	Value: 'pystroke'

## 7.2 Class GameEngine

Generic class to contain all logic for the basic running of the game

**Author:** James Heslin (PROGRAM\_IX)

### 7.2.1 Methods

<b>__init__</b> ( <i>self</i> , <i>screen</i> , <i>event_e</i> =EventEngine(InputEngine()), <i>fps</i> =60)
Constructs a GameEngine
<b>Parameters</b>
<b>screen:</b> The screen on which the game will be rendered - this will be passed around to other classes ( <i>type</i> =pygame.Surface)
<b>event_e:</b> The EventEngine that this will use to read events ( <i>type</i> =EventEngine)
<b>fps:</b> The number of frames to display/ticks to pass every second ( <i>type</i> =int)
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>update</b> ( <i>self</i> )
Performs per-frame logic
<b>Return Value</b>
Flag to tell Game what to do ( <i>type</i> =int)
<b>Author:</b> James Heslin (PROGRAM_IX)



**draw**(*self*)

Draws all necessary elements using the DrawEngine

**Author:** James Heslin (PROGRAM\_IX)**run**(*self*)

The main loop of the game

**Return Value**

Flag to tell Game what to do

*(type=int)***Author:** James Heslin (PROGRAM\_IX)**get\_key**(*self, key*)

Wraps the checking of key input

**Return Value**

The state of the key

*(type=boolean)*

## 8 Module `pystroke.hud`

### 8.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

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Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

*continued on next page*

Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

*continued on next page*

Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

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Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

*continued on next page*

Name	Description
SRCALPHA	<b>Value:</b> 65536
SRCCOLORKEY	<b>Value:</b> 4096
SWSURFACE	<b>Value:</b> 0
SYSWMEVENT	<b>Value:</b> 13
TIMER_RESOLUTION	<b>Value:</b> 10
USEREVENT	<b>Value:</b> 24
UYVY_OVERLAY	<b>Value:</b> 1498831189
VIDEOEXPOSE	<b>Value:</b> 17
VIDEORESIZE	<b>Value:</b> 16
YUY2_OVERLAY	<b>Value:</b> 844715353
YV12_OVERLAY	<b>Value:</b> 842094169
YVYU_OVERLAY	<b>Value:</b> 1431918169
__package__	<b>Value:</b> 'pystroke'

## 8.2 Class HUDElement

**Known Subclasses:** pystroke.hud.HUDLine, pystroke.hud.HUDPolygon, pystroke.hud.HUDText

Generic part of a heads-up display

**Author:** James Heslin (PROGRAM\_IX)

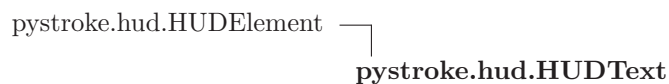
### 8.2.1 Methods

<b><code>__init__</code></b> ( <i>self</i> , <i>label</i> , <i>colour</i> )
Constructs a new HUDElement
<b>Parameters</b>
<b>label:</b> Identifier of the element ( <i>type=string</i> )
<b>colour:</b> Colour of the element ( <i>type=pygame.Colour</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

<b><code>draw</code></b> ( <i>self</i> , <i>screen</i> )
Draw the element to the screen
<b>Parameters</b>
<b>screen:</b> The surface onto which the game will be rendered ( <i>type=pygame.Surface</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

### 8.3 Class HUDText



An element of a heads-up display consisting of text

**Author:** James Heslin (PROGRAM\_IX)

#### 8.3.1 Methods

<b><code>__init__</code></b> ( <i>self, label, colour, text, pos, size, width</i> )
Constructs a new HUDElement
<b>Parameters</b>
<b>label:</b> Identifier of the text ( <i>type=string</i> )
<b>colour:</b> Colour of the text ( <i>type=pygame.Color</i> )
<b>text:</b> Text to display ( <i>type=string</i> )
<b>pos:</b> Coordinates of text start point ( <i>type=list/tuple containing two ints</i> )
Overrides: <code>pystroke.hud.HUDElement.__init__</code>
<b>Author:</b> James Heslin (PROGRAM_IX)

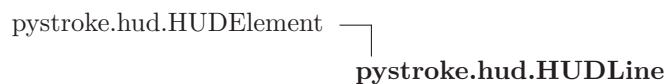
<b><code>draw</code></b> ( <i>self, screen</i> )
Render the text to the screen
<b>Parameters</b>
<b>screen:</b> The screen onto which the text should be rendered ( <i>type=pygame.Surface</i> )
Overrides: <code>pystroke.hud.HUDElement.draw</code>
<b>Author:</b> James Heslin (PROGRAM_IX)

#### 8.3.2 Class Variables

Name	Description
letters	<b>Value:</b> {'0': ((5, 15), (-5, -10), (-5, 15), (5, 15), (5, -10), (...)



## 8.4 Class HUDLine



An element of a heads-up display consisting of a line

**Author:** James Heslin (PROGRAM\_IX)

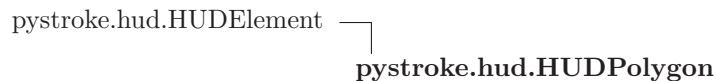
### 8.4.1 Methods

<b>__init__</b> ( <i>self, label, colour, line</i> )
Constructs a new HUDLine
<b>Parameters</b>
<b>label:</b> Identifier of the line ( <i>type=string</i> )
<b>colour:</b> Colour of the line ( <i>type=pygame.Color</i> )
<b>line:</b> Line arguments ( <i>type=list/tuple containing start position tuple (int, int), end position tuple (int, int), and width (int)</i> )
Overrides: <code>pystroke.hud.HUDElement.__init__</code>
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>draw</b> ( <i>self, screen</i> )
Render the line to the screen
<b>Parameters</b>
<b>screen:</b> The screen onto which the line should be rendered ( <i>type=pygame.Surface</i> )
Overrides: <code>pystroke.hud.HUDElement.draw</code>
<b>Author:</b> James Heslin (PROGRAM_IX)

## 8.5 Class HUDPolygon



An element of a heads-up display consisting of a polygon

**Author:** James Heslin (PROGRAM\_IX)

### 8.5.1 Methods

<b>__init__</b> ( <i>self</i> , <i>label</i> , <i>colour</i> , <i>lines</i> )
Constructs a new HUDElement
<b>Parameters</b>
<b>label:</b> Identifier of the polygon ( <i>type=string</i> )
<b>colour:</b> Colour of the polygon ( <i>type=pygame.Colour</i> )
<b>lines:</b> Lines portion of the element ( <i>type=list/tuple containing a tuple of points (each (int, int)) and an int</i> )
Overrides: pystroke.hud.HUDElement.__init__
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>draw</b> ( <i>self</i> , <i>screen</i> )
Render the polygon to the screen
<b>Parameters</b>
<b>screen:</b> The screen onto which the polygon is to be rendered ( <i>type=pygame.Surface</i> )
Overrides: pystroke.hud.HUDElement.draw
<b>Author:</b> James Heslin (PROGRAM_IX)

## 8.6 Class HUD

A heads-up display, which comprises various visual elements displayed on a screen to give information to a player

**Author:** James Heslin (PROGRAM\_IX)

### 8.6.1 Methods

<b>__init__</b> ( <i>self</i> )
Constructs a new HUD
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>add</b> ( <i>self</i> , <i>hud_el</i> )
Add a new element to the HUD
<b>Author:</b> James Heslin (PROGRAM_IX)

**draw**(*self*, *screen*)

Renders all elements of the HUD to the screen

**Parameters**

**screen:** The screen onto which the HUD is to be rendered  
(*type=pygame.Surface*)

**Author:** James Heslin (PROGRAM\_IX)

**get**(*self*, *label*)

Returns a HUDElement with matching label from elements, otherwise returns None

**Parameters**

**label:** The label of the HUDElement to retrieve  
(*type=string*)

**Return Value**

The HUDElement with the specified label  
(*type=HUDElement or None*)

**Author:** James Heslin (PROGRAM\_IX)

## 9 Module `pystroke.input_engine`

### 9.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

*continued on next page*

Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

*continued on next page*

Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

*continued on next page*

Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

*continued on next page*

Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

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Name	Description
SRCALPHA	<b>Value:</b> 65536
SRCCOLORKEY	<b>Value:</b> 4096
SWSURFACE	<b>Value:</b> 0
SYSWMEVENT	<b>Value:</b> 13
TIMER_RESOLUTION	<b>Value:</b> 10
USEREVENT	<b>Value:</b> 24
UYVY_OVERLAY	<b>Value:</b> 1498831189
VIDEOEXPOSE	<b>Value:</b> 17
VIDEORESIZE	<b>Value:</b> 16
YUY2_OVERLAY	<b>Value:</b> 844715353
YV12_OVERLAY	<b>Value:</b> 842094169
YVYU_OVERLAY	<b>Value:</b> 1431918169
__package__	<b>Value:</b> 'pystroke'

## 9.2 Class InputEngine

Receives input events from an EventEngine and uses them to maintain an up- to-date keyboard/mouse state

**Author:** James Heslin (PROGRAM\_IX)

### 9.2.1 Methods

<b>__init__</b> ( <i>self</i> )
Constructs a new InputEngine
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>mouse_motion</b> ( <i>self, event</i> )
Processes MOUSEMOTION events
<b>Parameters</b>
<b>event:</b> A MOUSEMOTION event
( <i>type=pygame.Event</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

<b>mouse_b_down</b> ( <i>self, event</i> )
Processes MOUSEBUTTONDOWN events
<b>Parameters</b>
<b>event:</b> A MOUSEBUTTONDOWN event
( <i>type=pygame.Event</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

**mouse\_b\_up**(*self*, *event*)

Processes MOUSEBUTTONUP events

**Parameters**

**event:** A MOUSEBUTTONUP event  
(*type=pygame.Event*)

**Author:** James Heslin (PROGRAM\_IX)**key\_down**(*self*, *event*)

Processes KEYDOWN events

**Parameters**

**event:** A KEYDOWN event  
(*type=pygame.Event*)

**Author:** James Heslin (PROGRAM\_IX)**key\_up**(*self*, *event*)

Processes KEYUP events

**Parameters**

**event:** A KEYUP event  
(*type=pygame.Event*)

**Author:** James Heslin (PROGRAM\_IX)**reset**(*self*)

Reset all the input values

**Author:** James Heslin (PROGRAM\_IX)**print\_all\_states**(*self*)

Print the states of all tracked inputs

**Author:** James Heslin (PROGRAM\_IX)

## 10 Module *pystroke.locals*

### 10.1 Variables

Name	Description
SWITCH_FLAG	<b>Value:</b> 0
QUIT_FLAG	<b>Value:</b> 1
CONTINUE_FLAG	<b>Value:</b> 2
__package__	<b>Value:</b> None

## 11 Module pystroke.vector2

### 11.1 Variables

Name	Description
<code>__package__</code>	<b>Value:</b> 'pystroke'

### 11.2 Class Vector2

A two-dimensional vector

**Author:** James Heslin (PROGRAM\_IX)

#### 11.2.1 Methods

<code>__init__(self, x=0.0, y=0.0)</code>
Constructs a new Vector2
<b>Parameters</b>
<b>x:</b> X (horizontal) co-ordinate of vector ( <i>type=double</i> )
<b>y:</b> Y (vertical) co-ordinate of vector ( <i>type=double</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

<code>__str__(self)</code>
Returns a string with the vector's co-ordinates
<b>Return Value</b>
A string containing the vector's co-ordinates ( <i>type=string</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

---

**from\_points**(*a*, *b*)

---

Returns a new Vector2 with the co-ordinates of the difference between the two points**Parameters**

**a:** The first point to use in constructing the new Vector2

(*type=tuple/list of two ints*)

**b:** The second point to use in constructing the new Vector2

(*type=tuple/list of two ints*)

**Return Value**

A new Vector2 constructed from the inputted points

(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)

---

**get\_magnitude**(*self*)

---

Returns the magnitude of the vector**Return Value**

The magnitude of the vector

(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

---

**normalised**(*self*)

---

Returns a normalised copy of the vector**Return Value**

Normalised copy of the vector

(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)

---

**dot\_product**(*self*, *other*)

---

Returns the dot product of the vector and the input vector**Parameters**

**other:** The vector to dot product against

(*type=Vector2*)

**Return Value**

The dot product of the vector and the input vector

(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

**cross\_product**(*self*, *other*)

Returns the cross product of the vector and the input vector

**Parameters**

**other:** The vector to cross product against  
(*type=Vector2*)

**Return Value**

The cross product of the vector and the input vector  
(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

**clamp**(*x*, *a*, *b*)

'Clamp' the value of x between a and b, i.e., return x if it is between a and b, a if x is lower than a, and b if x is larger than b

**Parameters**

**x:** The number to clamp  
(*type=double*)  
**a:** The lower bound of x's clamp  
(*type=double*)  
**b:** The upper bound of x's clamp  
(*type=double*)

**Return Value**

The clamped value of x  
(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

**radians\_between**(*self*, *other*)

Return the radians between the vector and the input vector

**Parameters**

**other:** The other vector making the angle  
(*type=Vector2*)

**Return Value**

The number of radians between the vector and the input vector  
TODO: Determine if this actually works, it's not being used  
(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

---

**get\_angle**(*self*)

---

Returns the angle this vector is pointing to**Return Value**

The angle this vector points to (in radians)

*(type=double)***Author:** James Heslin (PROGRAM\_IX)

---

**\_\_add\_\_**(*self*, *other*)

---

Add the vector to other and return the result**Parameters****other:** The vector to add*(type=Vector2)***Return Value**

The result of the vector being added to other

*(type=Vector2)***Author:** James Heslin (PROGRAM\_IX)

---

**\_\_sub\_\_**(*self*, *other*)

---

Subtract other from the vector and return the result**Parameters****other:** The vector to subtract*(type=Vector2)***Return Value**

The result of other being subtracted from the vector

*(type=Vector2)***Author:** James Heslin (PROGRAM\_IX)

---

**\_\_neg\_\_**(*self*)

---

Negate the vector and return the result**Return Value**

The negated vector

*(type=Vector2)***Author:** James Heslin (PROGRAM\_IX)

---

**\_\_mul\_\_**(*self*, *sca*)

---

Multiply the vector by other and return the result**Parameters**

**sca:** The scalar to multiply by  
(*type=double*)

**Return Value**

The result of the vector being multiplied by sca  
(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)

---

**\_\_div\_\_**(*self*, *sca*)

---

Divide the vector by sca and return the result**Parameters**

**sca:** The scalar to divide by  
(*type=double*)

**Return Value**

The result of the vector being divided by sca  
(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)



## 12 Module *pystroke.vex*

### 12.1 Variables

Name	Description
ACTIVEEVENT	Value: 1
ANYFORMAT	Value: 268435456
ASYNCBLIT	Value: 4
AUDIO_S16	Value: 32784
AUDIO_S16LSB	Value: 32784
AUDIO_S16MSB	Value: 36880
AUDIO_S16SYS	Value: 32784
AUDIO_S8	Value: 32776
AUDIO_U16	Value: 16
AUDIO_U16LSB	Value: 16
AUDIO_U16MSB	Value: 4112
AUDIO_U16SYS	Value: 16
AUDIO_U8	Value: 8
BIG_ENDIAN	Value: 4321
BLEND_ADD	Value: 1
BLEND_MAX	Value: 5
BLEND_MIN	Value: 4
BLEND_MULT	Value: 3
BLEND_RGBA_ADD	Value: 6
BLEND_RGBA_MAX	Value: 16
BLEND_RGBA_MIN	Value: 9
BLEND_RGBA_MULT	Value: 8
BLEND_RGBA_SUB	Value: 7
BLEND_RGB_ADD	Value: 1
BLEND_RGB_MAX	Value: 5
BLEND_RGB_MIN	Value: 4
BLEND_RGB_MULT	Value: 3
BLEND_RGB_SUB	Value: 2
BLEND_SUB	Value: 2
BUTTON_X1	Value: 6
BUTTON_X2	Value: 7
DOUBLEBUF	Value: 1073741824
FULLSCREEN	Value: -2147483648
GL_ACCELERATED_VISUAL	Value: 15
GL_ACCUM_ALPHA_SIZE	Value: 11
GL_ACCUM_BLUE_SIZE	Value: 10
GL_ACCUM_GREEN_SIZE	Value: 9
GL_ACCUM_RED_SIZE	Value: 8
GL_ALPHA_SIZE	Value: 3
GL_BLUE_SIZE	Value: 2
GL_BUFFER_SIZE	Value: 4
GL_DEPTH_SIZE	Value: 6
GL_DOUBLEBUFFER	Value: 5
GL_GREEN_SIZE	Value: 1

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Name	Description
GL_MULTISAMPLEBUFFERS	Value: 13
GL_MULTISAMPLESAMPLES	Value: 14
GL_RED_SIZE	Value: 0
GL_STENCIL_SIZE	Value: 7
GL_STEREO	Value: 12
GL_SWAP_CONTROL	Value: 16
HAT_CENTERED	Value: 0
HAT_DOWN	Value: 4
HAT_LEFT	Value: 8
HAT_LEFTDOWN	Value: 12
HAT_LEFTUP	Value: 9
HAT_RIGHT	Value: 2
HAT_RIGHTDOWN	Value: 6
HAT_RIGHTUP	Value: 3
HAT_UP	Value: 1
HWACCEL	Value: 256
HWPALETTE	Value: 536870912
HWSURFACE	Value: 1
IYUV_OVERLAY	Value: 1448433993
JOYAXISMOTION	Value: 7
JOYBALLMOTION	Value: 8
JOYBUTTONDOWN	Value: 10
JOYBUTTONUP	Value: 11
JOYHATMOTION	Value: 9
KEYDOWN	Value: 2
KEYUP	Value: 3
KMOD_ALT	Value: 768
KMOD_CAPS	Value: 8192
KMOD_CTRL	Value: 192
KMOD_LALT	Value: 256
KMOD_LCTRL	Value: 64
KMOD_LMETA	Value: 1024
KMOD_LSHIFT	Value: 1
KMOD_META	Value: 3072
KMOD_MODE	Value: 16384
KMOD_NONE	Value: 0
KMOD_NUM	Value: 4096
KMOD_RALT	Value: 512
KMOD_RCTRL	Value: 128
KMOD_RMETA	Value: 2048
KMOD_RSHIFT	Value: 2
KMOD_SHIFT	Value: 3
K_0	Value: 48
K_1	Value: 49
K_2	Value: 50
K_3	Value: 51
K_4	Value: 52
K_5	Value: 53

*continued on next page*

Name	Description
K_6	Value: 54
K_7	Value: 55
K_8	Value: 56
K_9	Value: 57
K_AMPERSAND	Value: 38
K_ASTERISK	Value: 42
K_AT	Value: 64
K_BACKQUOTE	Value: 96
K_BACKSLASH	Value: 92
K_BACKSPACE	Value: 8
K_BREAK	Value: 318
K_CAPSLOCK	Value: 301
K_CARET	Value: 94
K_CLEAR	Value: 12
K_COLON	Value: 58
K_COMMA	Value: 44
K_DELETE	Value: 127
K_DOLLAR	Value: 36
K_DOWN	Value: 274
K_END	Value: 279
K_EQUALS	Value: 61
K_ESCAPE	Value: 27
K_EURO	Value: 321
K_EXCLAIM	Value: 33
K_F1	Value: 282
K_F10	Value: 291
K_F11	Value: 292
K_F12	Value: 293
K_F13	Value: 294
K_F14	Value: 295
K_F15	Value: 296
K_F2	Value: 283
K_F3	Value: 284
K_F4	Value: 285
K_F5	Value: 286
K_F6	Value: 287
K_F7	Value: 288
K_F8	Value: 289
K_F9	Value: 290
K_FIRST	Value: 0
K_GREATER	Value: 62
K_HASH	Value: 35
K_HELP	Value: 315
K_HOME	Value: 278
K_INSERT	Value: 277
K_KP0	Value: 256
K_KP1	Value: 257
K_KP2	Value: 258
K_KP3	Value: 259
K_KP4	Value: 260

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Name	Description
K_KP5	Value: 261
K_KP6	Value: 262
K_KP7	Value: 263
K_KP8	Value: 264
K_KP9	Value: 265
K_KP_DIVIDE	Value: 267
K_KP_ENTER	Value: 271
K_KP_EQUALS	Value: 272
K_KP_MINUS	Value: 269
K_KP_MULTIPLY	Value: 268
K_KP_PERIOD	Value: 266
K_KP_PLUS	Value: 270
K_LALT	Value: 308
K_LAST	Value: 323
K_LCTRL	Value: 306
K_LEFT	Value: 276
K_LEFTBRACKET	Value: 91
K_LEFTPAREN	Value: 40
K_LESS	Value: 60
K_LMETA	Value: 310
K_LSHIFT	Value: 304
K_LSUPER	Value: 311
K_MENU	Value: 319
K_MINUS	Value: 45
K_MODE	Value: 313
K_NUMLOCK	Value: 300
K_PAGEDOWN	Value: 281
K_PAGEUP	Value: 280
K_PAUSE	Value: 19
K_PERIOD	Value: 46
K_PLUS	Value: 43
K_POWER	Value: 320
K_PRINT	Value: 316
K_QUESTION	Value: 63
K_QUOTE	Value: 39
K_QUOTEDBL	Value: 34
K_RALT	Value: 307
K_RCTRL	Value: 305
K_RETURN	Value: 13
K_RIGHT	Value: 275
K_RIGHTBRACKET	Value: 93
K_RIGHTPAREN	Value: 41
K_RMETA	Value: 309
K_RSHIFT	Value: 303
K_RSUPER	Value: 312
K_SCROLLOCK	Value: 302
K_SEMICOLON	Value: 59
K_SLASH	Value: 47
K_SPACE	Value: 32
K_SYSREQ	Value: 317

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Name	Description
K_TAB	Value: 9
K_UNDERSCORE	Value: 95
K_UNKNOWN	Value: 0
K_UP	Value: 273
K_a	Value: 97
K_b	Value: 98
K_c	Value: 99
K_d	Value: 100
K_e	Value: 101
K_f	Value: 102
K_g	Value: 103
K_h	Value: 104
K_i	Value: 105
K_j	Value: 106
K_k	Value: 107
K_l	Value: 108
K_m	Value: 109
K_n	Value: 110
K_o	Value: 111
K_p	Value: 112
K_q	Value: 113
K_r	Value: 114
K_s	Value: 115
K_t	Value: 116
K_u	Value: 117
K_v	Value: 118
K_w	Value: 119
K_x	Value: 120
K_y	Value: 121
K_z	Value: 122
LIL_ENDIAN	Value: 1234
MOUSEBUTTONDOWN	Value: 5
MOUSEBUTTONUP	Value: 6
MOUSEMOTION	Value: 4
NOEVENT	Value: 0
NOFRAME	Value: 32
NUMEVENTS	Value: 32
OPENGL	Value: 2
OPENGLBLIT	Value: 10
PREALLOC	Value: 16777216
QUIT	Value: 12
RESIZABLE	Value: 16
RLEACCEL	Value: 16384
RLEACCELOK	Value: 8192
SCRAP_BMP	Value: 'image/bmp'
SCRAP_CLIPBOARD	Value: 0
SCRAP_PBM	Value: 'image/pbm'
SCRAP_PPM	Value: 'image/ppm'
SCRAP_SELECTION	Value: 1
SCRAP_TEXT	Value: 'text/plain'

*continued on next page*

Name	Description
SRCALPHA	<b>Value:</b> 65536
SRCCOLORKEY	<b>Value:</b> 4096
SWSURFACE	<b>Value:</b> 0
SYSWMEVENT	<b>Value:</b> 13
TIMER_RESOLUTION	<b>Value:</b> 10
USEREVENT	<b>Value:</b> 24
UYVY_OVERLAY	<b>Value:</b> 1498831189
VIDEOEXPOSE	<b>Value:</b> 17
VIDEORESIZE	<b>Value:</b> 16
YUY2_OVERLAY	<b>Value:</b> 844715353
YV12_OVERLAY	<b>Value:</b> 842094169
YVYU_OVERLAY	<b>Value:</b> 1431918169
__package__	<b>Value:</b> 'pystroke'

## 12.2 Class Vex

Vector sprite class (consider renaming) - consists of a list of points which are rendered relative to an x and y at draw time

**Author:** James Heslin (PROGRAM\_IX)

### 12.2.1 Methods

<code>__str__(self)</code>
Returns a string containing the x and y of the vector sprite
<b>Return Value</b>
A string containing the x and y of the vector sprite
( <i>type=string</i> )
<b>Author:</b> James Heslin (PROGRAM_IX)

---

**init\_\_**(*self*, *x*, *y*, *colour*, *points*, *width*, *scale\_x*=1, *scale\_y*=1)

---

Constructs a new Vex

**Parameters**

**x:** The X (horizontal) co-ordinate of the vector sprite  
(*type=int*)

**y:** The Y (vertical) co-ordinate of the vector sprite  
(*type=int*)

**colour:** The colour of the vector sprite  
(*type=pygame.Color*)

**points:** The points that make up the vector sprite  
(*type=list/tuple of tuples (int, int)*)

**width:** The width of the vector sprite's lines  
(*type=int*)

**scale\_x:** The horizontal multiplier of the vector sprite's size  
(*type=double*)

**scale\_y:** The vertical multiplier of the vector sprite's size  
(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)

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---

**dir\_vec**(*self*)

---

Return a copy of the vector sprite's direction vector (the first vector in its list of points), adjusted to have absolute co-ordinates

**Return Value**

A copy of the vector sprites's direction vector, with absolute co-ordinates  
(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)

---



---

**rel\_dir**(*self*)

---

Returns a copy of the relative direction vector

**Return Value**

A copy of the relative direction vector  
(*type=Vector2*)

---



---

**draw**(*self*, *surface*)

---

Renders the vector sprite to the surface specified

**Parameters**

**surface:** The surface onto which the vector sprite is to be rendered  
(*type=pygame.Surface*)

**Author:** James Heslin (PROGRAM\_IX)

---

**update**(*self*, *surface*)

Updates the vector sprite with respect to the specified surface

**Parameters**

**surface:** The surface to update the vector sprite against  
(*type*=*pygame.Surface*)

**Author:** James Heslin (PROGRAM\_IX)

**distance\_to**(*self*, *p*)

Returns the distance between the centre of the vector sprite and the specified point

**Parameters**

**p:** The point to compare to the vector sprite  
(*type*=*Vector2*)

**Return Value**

The distance between the centre of the vector sprite and the specified point  
(*type*=*double*)

**Author:** James Heslin (PROGRAM\_IX)

**vector\_between**(*self*, *p*)

Returns the vector between the vector sprite and the specified point

**Parameters**

**p:** The point to compare to the vector sprite  
(*type*=*Vector2*)

**Return Value**

The vector between the vector sprite and the specified point  
(*type*=*Vector2*)

**Author:** James Heslin (PROGRAM\_IX)

**angle\_to\_face\_point**(*self*, *p*)

Return the rotation angle (in radians) required for the vector sprite to face a specified point (face: the vector sprite's direction vector is pointing towards the point)

**Parameters**

**p:** The point to face  
(*type*=*Vector2*)

**Return Value**

The rotation angle (in radians) required for the vector sprite to face p  
(*type*=*double*)

**Author:** James Heslin (PROGRAM\_IX)



**rotate\_to\_face\_point**(*self*, *p*)

Rotate the vex to face a specified point

**Parameters**

**p:** The point to face  
(*type=Vector2*)

**Author:** James Heslin (PROGRAM\_IX)**rotate\_by\_radians**(*self*, *a*)

Rotate the shape by a given number of radians

**Parameters**

**a:** The number of radians to rotate the vector sprite by  
(*type=double*)

**Author:** James Heslin (PROGRAM\_IX)**move\_abs**(*self*, *x*, *y*, *surface*)

Move the vector sprite in the X/Y plane without leaving the bounds of the specified surface  
- performs vector calculation to make sure diagonal movement is not faster than cardinal

**Parameters**

**x:** The X (horizontal) movement amount  
(*type=double*)

**y:** The Y (vertical) movement amount  
(*type=double*)

**surface:** The surface to use to restrict the movement of the vector sprite  
(*type=pygame.Surface*)

**Author:** James Heslin (PROGRAM\_IX)**move\_rel**(*self*, *x*, *y*, *surface*)

Move the vector sprite in the X/Y plane without leaving the bounds of the specified surface  
- assumes all inputs have already been calculated to restrict movement speed

**Parameters**

**x:** The X (horizontal) movement amount  
(*type=double*)

**y:** The Y (vertical) movement amount  
(*type=double*)

**surface:** The surface to use to restrict the movement of the vector sprite  
(*type=pygame.Surface*)

**Author:** James Heslin (PROGRAM\_IX)

**get\_relative\_points\_tuple(self)**

Returns a list of 2D points as tuples, relative to vector sprite position, respective of scale

**Return Value**

A list of tuples representing the points in the vector sprite, with co-ordinates relative to the vector sprite's position, respective of scale

*(type=list of tuples (int, int))*

**Author:** James Heslin (PROGRAM\_IX)

**get\_absolute\_points\_tuple(self)**

Returns a list of 2D points as tuples, relative to origin, respective of scale

**Return Value**

A list of tuples representing the points in the vector sprite, with co-ordinates relative to the origin, respective of scale

*(type=list of tuples (int, int))*

**Author:** James Heslin (PROGRAM\_IX)

**get\_relative\_points\_vector2(self)**

Returns a list of Vector2 objects representing 2D points, relative to vector sprite position, respective of scale

**Return Value**

A list of Vector2 objects representing the points in the vector sprite, with co-ordinates relative to the vector sprite's position, respective of scale

*(type=list of Vector2 objects)*

**Author:** James Heslin (PROGRAM\_IX)

**get\_absolute\_points\_vector2(self)**

Returns a list of Vector2 objects representing 2D points, relative to origin, respective of scale

**Return Value**

A list of Vector2 objects representing the points in the vector sprite, with co-ordinates relative to the origin, respective of scale

*(type=list of Vector2 objects)*

**Author:** James Heslin (PROGRAM\_IX)

**point\_inside**(*self*, *v*)

Determines roughly if a given point is inside the vector sprite, can be used for crude collision detection

**Parameters**

**v:** The point to check  
(*type=Vector2*)

**Return Value**

True if the point is inside the vector sprite, False otherwise  
(*type=boolean*)

**Author:** James Heslin (PROGRAM\_IX)

### 12.2.2 Class Variables

Name	Description
radius	<b>Value:</b> 20

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