

Introduction

Introduction

pico-Céu is a tiny programming environment for visual and interactive applications such as video games. It is composed of the programming language Céu and minimalist libraries for input, graphics, network, and sound.

Graphics

Graphics

Provides graphics operations, such as for drawing pixels and images on the screen.

Configuration

GRAPHICS_SET_COLOR_NAME

Changes the color of all subsequent drawing operations.

output (Color) GRAPHICS_SET_COLOR_NAME

- Parameters:
 - **Color**: new color name

The color names are based on the *HTML Web Colors*:

https://en.wikipedia.org/wiki/Web_colors#HTML_color_names

The possible values are COLOR_WHITE, COLOR_SILVER, COLOR_GRAY, COLOR_BLACK, COLOR_RED, COLOR_MAROON, COLOR_YELLOW, COLOR_OLIVE, COLOR_LIME, COLOR_GREEN, COLOR_AQUA, COLOR_TEAL, COLOR_BLUE, COLOR_NAVY, COLOR_FUCHSIA, COLOR_PURPLE.

The default color is white.

GRAPHICS_SET_COLOR_RGB

Changes the color in RGB of all subsequent drawing operations.

output (integer, integer, integer) GRAPHICS_SET_COLOR_RGB

- Parameters:
 - **integer**: new red component
 - **integer**: new green component
 - **integer**: new blue component

The default color is white.

GRAPHICS_SET_GRID

Enables or disables a visual grid delimiting the screen pixels.

output (yesno) GRAPHICS_SET_GRID

- Parameters:
 - **yesno**: new state
 - * **yes**: enables the grid
 - * **no**: disables the grid

The ratio between the real and logical dimensions set with WINDOW_SET_SIZE must be greater than one.

GRAPHICS_SET_FONT

Changes the font for drawing and writing text.

output (text,integer) GRAPHICS_SET_FONT

- Parameters:
 - **text**: path for the .ttf font filename
 - **integer**: height of the new font in pixels

GRAPHICS_SET_WRITE_CURSOR

Changes the cursor position for writing text with GRAPHICS_WRITE and GRAPHICS_WRITELN.

output (integer,integer) GRAPHICS_SET_WRITE_CURSOR

- Parameters:
 - **integer**: new position in the x-axis
 - **integer**: new position in the y-axis

Drawing

GRAPHICS_CLEAR

Clears the screen.

output (none) GRAPHICS_CLEAR

- Parameters:
 - **none**: no parameters

The clear color is specified with GRAPHICS_SET_COLOR_NAME or GRAPHICS_SET_COLOR_RGB.

GRAPHICS_DRAW_BMP

Draws a bitmap image on the screen.

output (integer, integer, text) GRAPHICS_DRAW_BMP

- Parameters:
 - integer: position in the x-axis
 - integer: position in the y-axis
 - text: path for the .bmp image filename

GRAPHICS_DRAW_PIXEL

Draws a pixel on the screen.

output (integer, integer) GRAPHICS_DRAW_PIXEL

- Parameters:
 - integer: position in the x-axis
 - integer: position in the y-axis

The drawing color is specified with GRAPHICS_SET_COLOR_NAME or GRAPHICS_SET_COLOR_RGB.

GRAPHICS_DRAW_LINE

Draws a line on the screen.

output (integer, integer, integer, integer) GRAPHICS_DRAW_LINE;

- Parameters:
 - integer: start position in the x-axis
 - integer: start position in the y-axis
 - integer: end position in the x-axis
 - integer: end position in the y-axis

The drawing color is specified with GRAPHICS_SET_COLOR_NAME or GRAPHICS_SET_COLOR_RGB.

GRAPHICS_DRAW_RECT

Draws a rectangle on the screen.

output (integer, integer, integer, integer) GRAPHICS_DRAW_RECT

- Parameters:
 - integer: position in the x-axis
 - integer: position in the y-axis
 - integer: rectangle width
 - integer: rectangle height

The drawing color is specified with GRAPHICS_SET_COLOR_NAME or GRAPHICS_SET_COLOR_RGB.

GRAPHICS_DRAW_TEXT

Draws a text on the screen.

output (int,int,text) GRAPHICS_DRAW_TEXT;

- Parameters:
 - **integer**: position in the x-axis
 - **integer**: position in the y-axis
 - **text**: text to draw

The drawing font is specified with **GRAPHICS_SET_FONT**. The drawing color is specified with **GRAPHICS_SET_COLOR_NAME** or **GRAPHICS_SET_COLOR_RGB**.

Writing

GRAPHICS_WRITE

Writes a text on the screen.

output (text) GRAPHICS_WRITE;

- Parameters:
 - **text**: text to draw

The drawing position is first specified with **GRAPHICS_SET_WRITE_CURSOR**. The cursor advances automatically for the position after the text. The drawing font is specified with **GRAPHICS_SET_FONT**. The drawing color is specified with **GRAPHICS_SET_COLOR_NAME** or **GRAPHICS_SET_COLOR_RGB**.

GRAPHICS_WRITELN

Writes a line of text on the screen.

output (text) GRAPHICS_WRITELN;

The drawing position is first specified with **GRAPHICS_SET_WRITE_CURSOR**. The cursor advances automatically for the next line after the text, at the same initial position. The drawing font is specified with **GRAPHICS_SET_FONT**. The drawing color is specified with **GRAPHICS_SET_COLOR_NAME** or **GRAPHICS_SET_COLOR_RGB**.

Other

GRAPHICS_SCREENSHOT

Takes a screen shot.

output (text) GRAPHICS_SCREENSHOT

- Parameters:

- `text`: path for the `.bmp` image filename to generate

Input Devices

Input Devices

Provides input handling, such as for keyboard and mouse.

Keyboard

KEY_PRESS

`input (integer) KEY_PRESS`

- Occurrences:
 - whenever a keyboard key is pressed
- Payload:
 - `integer`: numeric key code

TODO: key codes

KEY_UNPRESS

`input (integer) KEY_UNPRESS`

- Occurrences:
 - whenever a keyboard key is released
- Payload:
 - `integer`: numeric key code

TODO: key codes

Mouse

MOUSE_CLICK

`input (integer,integer,integer) MOUSE_CLICK`

- Occurrences:
 - whenever a mouse button is pressed
- Payload:
 - `integer`: numeric button code (TODO: left, middle, right?)
 - `integer`: current mouse position in the x-axis
 - `integer`: current mouse position in the y-axis

MOUSE_UNCLICK

input (integer, integer, integer) MOUSE_UNCLICK

- Occurrences:
 - whenever a mouse button is released
- Payload:
 - **integer**: numeric button code (TODO: left, middle, right?)
 - **integer**: current mouse position in the x-axis
 - **integer**: current mouse position in the y-axis

MOUSE_MOVE

input (integer, integer) MOUSE_MOVE

- Occurrences:
 - whenever the mouse moves
- Payload:
 - **integer**: current mouse position in the x-axis
 - **integer**: current mouse position in the y-axis

Sound

Sound

Provides sound playback.

Configuration

SOUND_SET_VOLUME

Changes the volume of all subsequent sound playbacks.

output (integer) SOUND_SET_VOLUME

- Parameters:
 - **integer**: new sound volume in percentage (from 0 to 100)

Playback

SOUND_PLAY

Plays a sound file.

output (text) SOUND_PLAY

- Parameters:

- **text**: path for the sound filename

The playback volume is specified with **SOUND_SET_VOLUME**.

Network

Network

Provides unreliable broadcast communication between peers.

Send

NET_SEND

Broadcasts a message to all peers.

output (integer,byte&&) **NET_SEND**;

- Parameters:
 - **integer**: number of bytes to transmit
 - **byte&&**: stream of bytes

Receive

NET_RECEIVE

Receives all messages from all peers, including itself.

input (integer,byte&&) **NET_RECEIVE**;

- Occurrences:
 - on every received message
- Payload:
 - **integer**: number of received bytes
 - **byte&&**: stream of bytes

Frame Management

Frame Management

Manages the game frames, such as for updating animations and redrawing the screen.

Configuration

FRAMES_SET

Enables or disables the generation of periodic `FRAMES_UPDATE` and `FRAMES_REDRAW` inputs to the application.

output (yesno) `FRAMES_SET`

- Parameters:
 - **yesno**: new state
 - * **yes**: enables the generation of frames
 - * **no**: disables the generation of frames

FRAMES_SET_CLEAR_COLOR_NAME

Changes the redrawing background color.

output (Color) `FRAMES_SET_CLEAR_COLOR_NAME`

- Parameters:
 - **Color**: new color name

The color names are based on the *HTML Web Colors*:

https://en.wikipedia.org/wiki/Web_colors#HTML_color_names

The possible values are `COLOR_WHITE`, `COLOR_SILVER`, `COLOR_GRAY`, `COLOR_BLACK`, `COLOR_RED`, `COLOR_MAROON`, `COLOR_YELLOW`, `COLOR_OLIVE`, `COLOR_LIME`, `COLOR_GREEN`, `COLOR_AQUA`, `COLOR_TEAL`, `COLOR_BLUE`, `COLOR_NAVY`, `COLOR_FUCHSIA`, `COLOR_PURPLE`.

The default color is black.

FRAMES_SET_CLEAR_COLOR_RGB

Changes the redrawing background color in RGB.

output (integer,integer,integer) `FRAMES_SET_CLEAR_COLOR_RGB`

- Parameters:
 - **integer**: new red component
 - **integer**: new green component
 - **integer**: new blue component

On every frame before `FRAMES_REDRAW`, the screen is cleared with the background color.

The default color is black.

Update

FRAMES_UPDATE

input (integer) FRAMES_UPDATE

- Occurrences:
 - on every frame, before FRAMES_REDRAW
- Payload:
 - **integer**: the number of elapsed milliseconds since the previous frame

Redraw

FRAMES_REDRAW

input (none) FRAMES_REDRAW

- Occurrences:
 - on every frame, after FRAMES_UPDATE
- Payload:
 - **none**: no payload

Before the input occurs, the screen is cleared with the color set with FRAMES_SET_CLEAR_COLOR_NAME or FRAMES_SET_CLEAR_COLOR_RGB.

Window Management

Window Management

Manages the application window.

Configuration

WINDOW_SET_SIZE

Changes the real and logical sizes of the window.

output (integer, integer, integer, integer) WINDOW_SET_SIZE

- Parameters:
 - **integer**: new real width
 - **integer**: new real height
 - **integer**: new logical width
 - **integer**: new logical height

The window is automatically cleared with black.

The arithmetic division between the real and logical dimensions must be exact.

WINDOW_SET_TITLE

Changes the title of the window.

output (text) WINDOW_SET_TITLE

- Parameters:
 - text: new window title

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