raylib

A simple and easy-to-use library to enjoy videogames programming

[raylib Discord server][github.com/raysan5/raylib]

v4.0 quick reference card [download as PDF]

module: core

```
// Window-related functions
void InitWindow(int width, int height, const char *title);              // Initialize window and OpenGL context
bool WindowShouldClose(void);                                           // Check if KEY_ESCAPE pressed or Close icon pressed
void CloseWindow(void);                                                 // Close window and unload OpenGL context
bool IsWindowReady(void);                                               // Check if window has been initialized successfully
bool IsWindowFullscreen(void);                                          // Check if window is currently fullscreen
bool IsWindowHidden(void);                                              // Check if window is currently hidden (only PLATFORM_DESKTOP)
bool IsWindowMinimized(void);                                           // Check if window is currently minimized (only PLATFORM_DESKTOP)
bool IsWindowMaximized(void);                                           // Check if window is currently maximized (only PLATFORM_DESKTOP)
bool IsWindowFocused(void);                                             // Check if window is currently focused (only PLATFORM_DESKTOP)
bool IsWindowResized(void);                                             // Check if window has been resized last frame
bool IsWindowState(unsigned int flag);                                  // Check if one specific window flag is enabled
void SetWindowState(unsigned int flags);                                // Set window configuration state using flags
void ClearWindowState(unsigned int flags);                              // Clear window configuration state flags
void ToggleFullscreen(void);                                            // Toggle window state: fullscreen/windowed (only PLATFORM_DESKTOP)
void MaximizeWindow(void);                                              // Set window state: maximized, if resizable (only PLATFORM_DESKTOP)
void MinimizeWindow(void);                                              // Set window state: minimized, if resizable (only PLATFORM_DESKTOP)
void RestoreWindow(void);                                               // Set window state: not minimized/maximized (only PLATFORM_DESKTOP)
void SetWindowIcon(Image image);                                        // Set icon for window (only PLATFORM_DESKTOP)
void SetWindowTitle(const char *title);                                 // Set title for window (only PLATFORM_DESKTOP)
void SetWindowPosition(int x, int y);                                   // Set window position on screen (only PLATFORM_DESKTOP)
void SetWindowMonitor(int monitor);                                     // Set monitor for the current window (fullscreen mode)
void SetWindowMinSize(int width, int height);                           // Set window minimum dimensions (for FLAG_WINDOW_RESIZABLE)
void SetWindowSize(int width, int height);                              // Set window dimensions
void *GetWindowHandle(void);                                            // Get native window handle
int GetScreenWidth(void);                                               // Get current screen width
int GetScreenHeight(void);                                              // Get current screen height
int GetMonitorCount(void);                                              // Get number of connected monitors
int GetCurrentMonitor(void);                                            // Get current connected monitor
Vector2 GetMonitorPosition(int monitor);                                // Get specified monitor position
int GetMonitorWidth(int monitor);                                       // Get specified monitor width (max available by monitor)
int GetMonitorHeight(int monitor);                                      // Get specified monitor height (max available by monitor)
int GetMonitorPhysicalWidth(int monitor);                               // Get specified monitor physical width in millimetres
int GetMonitorPhysicalHeight(int monitor);                              // Get specified monitor physical height in millimetres
int GetMonitorRefreshRate(int monitor);                                 // Get specified monitor refresh rate
Vector2 GetWindowPosition(void);                                        // Get window position XY on monitor
Vector2 GetWindowScaleDPI(void);                                        // Get window scale DPI factor
const char *GetMonitorName(int monitor);                                // Get the human-readable, UTF-8 encoded name of the primary monitor
void SetClipboardText(const char *text);                                // Set clipboard text content
const char *GetClipboardText(void);                                     // Get clipboard text content

// Cursor-related functions
void ShowCursor(void);                                                  // Shows cursor
void HideCursor(void);                                                  // Hides cursor
bool IsCursorHidden(void);                                              // Check if cursor is not visible
void EnableCursor(void);                                                // Enables cursor (unlock cursor)
void DisableCursor(void);                                               // Disables cursor (lock cursor)
bool IsCursorOnScreen(void);                                            // Check if cursor is on the screen

// Drawing-related functions
void ClearBackground(Color color);                                      // Set background color (framebuffer clear color)
void BeginDrawing(void);                                                // Setup canvas (framebuffer) to start drawing
void EndDrawing(void);                                                  // End canvas drawing and swap buffers (double buffering)
void BeginMode2D(Camera2D camera);                                      // Begin 2D mode with custom camera (2D)
void EndMode2D(void);                                                   // Ends 2D mode with custom camera
void BeginMode3D(Camera3D camera);                                      // Begin 3D mode with custom camera (3D)
void EndMode3D(void);                                                   // Ends 3D mode and returns to default 2D orthographic mode
void BeginTextureMode(RenderTexture2D target);                          // Begin drawing to render texture
void EndTextureMode(void);                                              // Ends drawing to render texture
void BeginShaderMode(Shader shader);                                    // Begin custom shader drawing
void EndShaderMode(void);                                               // End custom shader drawing (use default shader)
void BeginBlendMode(int mode);                                          // Begin blending mode (alpha, additive, multiplied, subtract, custom)
void EndBlendMode(void);                                                // End blending mode (reset to default: alpha blending)
void BeginScissorMode(int x, int y, int width, int height);             // Begin scissor mode (define screen area for following drawing)
void EndScissorMode(void);                                              // End scissor mode
void BeginVrStereoMode(VrStereoConfig config);                          // Begin stereo rendering (requires VR simulator)
void EndVrStereoMode(void);                                             // End stereo rendering (requires VR simulator)

// VR stereo config functions for VR simulator
VrStereoConfig LoadVrStereoConfig(VrDeviceInfo device);                 // Load VR stereo config for VR simulator device parameters
void UnloadVrStereoConfig(VrStereoConfig config);                       // Unload VR stereo config

// Shader management functions
// NOTE: Shader functionality is not available on OpenGL 1.1
Shader LoadShader(const char *vsFileName, const char *fsFileName);      // Load shader from files and bind default locations
Shader LoadShaderFromMemory(const char *vsCode, const char *fsCode);    // Load shader from code strings and bind default locations
int GetShaderLocation(Shader shader, const char *uniformName);          // Get shader uniform location
int GetShaderLocationAttrib(Shader shader, const char *attribName);     // Get shader attribute location
void SetShaderValue(Shader shader, int locIndex, const void *value, int uniformType);               // Set shader uniform value
void SetShaderValueV(Shader shader, int locIndex, const void *value, int uniformType, int count);   // Set shader uniform value vector
void SetShaderValueMatrix(Shader shader, int locIndex, Matrix mat);         // Set shader uniform value (matrix 4x4)
void SetShaderValueTexture(Shader shader, int locIndex, Texture2D texture); // Set shader uniform value for texture (sampler2d)
void UnloadShader(Shader shader);                                       // Unload shader from GPU memory (VRAM)

// Screen-space-related functions
Ray GetMouseRay(Vector2 mousePosition, Camera camera);                  // Get a ray trace from mouse position
Matrix GetCameraMatrix(Camera camera);                                  // Get camera transform matrix (view matrix)
Matrix GetCameraMatrix2D(Camera2D camera);                              // Get camera 2d transform matrix
Vector2 GetWorldToScreen(Vector3 position, Camera camera);              // Get the screen space position for a 3d world space position
Vector2 GetWorldToScreenEx(Vector3 position, Camera camera, int width, int height); // Get size position for a 3d world space position
Vector2 GetWorldToScreen2D(Vector2 position, Camera2D camera);          // Get the screen space position for a 2d camera world space position
Vector2 GetScreenToWorld2D(Vector2 position, Camera2D camera);          // Get the world space position for a 2d camera screen space position

// Timing-related functions
void SetTargetFPS(int fps);                                             // Set target FPS (maximum)
int GetFPS(void);                                                       // Get current FPS
float GetFrameTime(void);                                               // Get time in seconds for last frame drawn (delta time)
double GetTime(void);                                                   // Get elapsed time in seconds since InitWindow()

// Misc. functions
int GetRandomValue(int min, int max);                                   // Get a random value between min and max (both included)
void SetRandomSeed(unsigned int seed);                                  // Set the seed for the random number generator
void TakeScreenshot(const char *fileName);                              // Takes a screenshot of current screen (filename extension defines format)
void SetConfigFlags(unsigned int flags);                                // Setup init configuration flags (view FLAGS)

void TraceLog(int logLevel, const char *text, ...);                     // Show trace log messages (LOG_DEBUG, LOG_INFO, LOG_WARNING, LOG_ERROR...)
void SetTraceLogLevel(int logLevel);                                    // Set the current threshold (minimum) log level
void *MemAlloc(int size);                                               // Internal memory allocator
void *MemRealloc(void *ptr, int size);                                  // Internal memory reallocator
void MemFree(void *ptr);                                                // Internal memory free

// Set custom callbacks
// WARNING: Callbacks setup is intended for advance users
void SetTraceLogCallback(TraceLogCallback callback);                    // Set custom trace log
void SetLoadFileDataCallback(LoadFileDataCallback callback);            // Set custom file binary data loader
void SetSaveFileDataCallback(SaveFileDataCallback callback);            // Set custom file binary data saver
void SetLoadFileTextCallback(LoadFileTextCallback callback);            // Set custom file text data loader
void SetSaveFileTextCallback(SaveFileTextCallback callback);            // Set custom file text data saver

// Files management functions
unsigned char *LoadFileData(const char *fileName, unsigned int *bytesRead);     // Load file data as byte array (read)
void UnloadFileData(unsigned char *data);                               // Unload file data allocated by LoadFileData()
bool SaveFileData(const char *fileName, void *data, unsigned int bytesToWrite); // Save data to file from byte array (write), returns true on success
char *LoadFileText(const char *fileName);                               // Load text data from file (read), returns a '\0' terminated string
void UnloadFileText(char *text);                                        // Unload file text data allocated by LoadFileText()
bool SaveFileText(const char *fileName, char *text);                    // Save text data to file (write), string must be '\0' terminated, returns true on success
bool FileExists(const char *fileName);                                  // Check if file exists
bool DirectoryExists(const char *dirPath);                              // Check if a directory path exists
bool IsFileExtension(const char *fileName, const char *ext);            // Check file extension (including point: .png, .wav)
const char *GetFileExtension(const char *fileName);                     // Get pointer to extension for a filename string (includes dot: '.png')
const char *GetFileName(const char *filePath);                          // Get pointer to filename for a path string
const char *GetFileNameWithoutExt(const char *filePath);                // Get filename string without extension (uses static string)
const char *GetDirectoryPath(const char *filePath);                     // Get full path for a given fileName with path (uses static string)
const char *GetPrevDirectoryPath(const char *dirPath);                  // Get previous directory path for a given path (uses static string)
const char *GetWorkingDirectory(void);                                  // Get current working directory (uses static string)
char **GetDirectoryFiles(const char *dirPath, int *count);              // Get filenames in a directory path (memory should be freed)
void ClearDirectoryFiles(void);                                         // Clear directory files paths buffers (free memory)
bool ChangeDirectory(const char *dir);                                  // Change working directory, return true on success
bool IsFileDropped(void);                                               // Check if a file has been dropped into window
char **GetDroppedFiles(int *count);                                     // Get dropped files names (memory should be freed)
void ClearDroppedFiles(void);                                           // Clear dropped files paths buffer (free memory)
long GetFileModTime(const char *fileName);                              // Get file modification time (last write time)
```

```
// Compression/Encoding functionality
unsigned char *CompressData(unsigned char *data, int dataLength, int *compDataLength);        // Compress data (DEFLATE algorithm)
unsigned char *DecompressData(unsigned char *compData, int compDataLength, int *dataLength);  // Decompress data (DEFLATE algorithm)
char *EncodeDataBase64(const unsigned char *data, int dataLength, int *outputLength);         // Encode data to Base64 string
unsigned char *DecodeDataBase64(unsigned char *data, int *outputLength);                      // Decode Base64 string data

// Persistent storage management
bool SaveStorageValue(unsigned int position, int value);              // Save integer value to storage file (to defined position), returns true on success
int LoadStorageValue(unsigned int position);                          // Load integer value from storage file (from defined position)

// Misc.
void OpenURL(const char *url);                                        // Open URL with default system browser (if available)

// Input-related functions: keyboard
bool IsKeyPressed(int key);                                           // Check if a key has been pressed once
bool IsKeyDown(int key);                                              // Check if a key is being pressed
bool IsKeyReleased(int key);                                          // Check if a key has been released once
bool IsKeyUp(int key);                                                // Check if a key is NOT being pressed
void SetExitKey(int key);                                             // Set a custom key to exit program (default is ESC)
int GetKeyPressed(void);                                              // Get key pressed (keycode), call it multiple times for keys queued, returns 0 when the queue is empty
int GetCharPressed(void);                                             // Get char pressed (unicode), call it multiple times for chars queued, returns 0 when the queue is emp

// Input-related functions: gamepads
bool IsGamepadAvailable(int gamepad);                                 // Check if a gamepad is available
const char *GetGamepadName(int gamepad);                              // Get gamepad internal name id
bool IsGamepadButtonPressed(int gamepad, int button);                 // Check if a gamepad button has been pressed once
bool IsGamepadButtonDown(int gamepad, int button);                    // Check if a gamepad button is being pressed
bool IsGamepadButtonReleased(int gamepad, int button);                // Check if a gamepad button has been released once
bool IsGamepadButtonUp(int gamepad, int button);                      // Check if a gamepad button is NOT being pressed
int GetGamepadButtonPressed(void);                                    // Get the last gamepad button pressed
int GetGamepadAxisCount(int gamepad);                                 // Get gamepad axis count for a gamepad
float GetGamepadAxisMovement(int gamepad, int axis);                  // Get axis movement value for a gamepad axis
int SetGamepadMappings(const char *mappings);                         // Set internal gamepad mappings (SDL_GameControllerDB)

// Input-related functions: mouse
bool IsMouseButtonPressed(int button);                                // Check if a mouse button has been pressed once
bool IsMouseButtonDown(int button);                                   // Check if a mouse button is being pressed
bool IsMouseButtonReleased(int button);                               // Check if a mouse button has been released once
bool IsMouseButtonUp(int button);                                     // Check if a mouse button is NOT being pressed
int GetMouseX(void);                                                  // Get mouse position X
int GetMouseY(void);                                                  // Get mouse position Y
Vector2 GetMousePosition(void);                                       // Get mouse position XY
Vector2 GetMouseDelta(void);                                          // Get mouse delta between frames
void SetMousePosition(int x, int y);                                  // Set mouse position XY
void SetMouseOffset(int offsetX, int offsetY);                        // Set mouse offset
void SetMouseScale(float scaleX, float scaleY);                       // Set mouse scaling
float GetMouseWheelMove(void);                                        // Get mouse wheel movement Y
void SetMouseCursor(int cursor);                                      // Set mouse cursor

// Input-related functions: touch
int GetTouchX(void);                                                  // Get touch position X for touch point 0 (relative to screen size)
int GetTouchY(void);                                                  // Get touch position Y for touch point 0 (relative to screen size)
Vector2 GetTouchPosition(int index);                                  // Get touch position XY for a touch point index (relative to screen size)
int GetTouchPointId(int index);                                       // Get touch point identifier for given index
int GetTouchPointCount(void);                                         // Get number of touch points

// Gestures and Touch Handling Functions (Module: rgestures)
void SetGesturesEnabled(unsigned int flags);                          // Enable a set of gestures using flags
bool IsGestureDetected(int gesture);                                  // Check if a gesture have been detected
int GetGestureDetected(void);                                         // Get latest detected gesture
float GetGestureHoldDuration(void);                                   // Get gesture hold time in milliseconds
Vector2 GetGestureDragVector(void);                                   // Get gesture drag vector
float GetGestureDragAngle(void);                                      // Get gesture drag angle
Vector2 GetGesturePinchVector(void);                                  // Get gesture pinch delta
float GetGesturePinchAngle(void);                                     // Get gesture pinch angle

// Camera System Functions (Module: rcamera)
void SetCameraMode(Camera camera, int mode);                          // Set camera mode (multiple camera modes available)
void UpdateCamera(Camera *camera);                                    // Update camera position for selected mode

void SetCameraPanControl(int keyPan);                                 // Set camera pan key to combine with mouse movement (free camera)
void SetCameraAltControl(int keyAlt);                                 // Set camera alt key to combine with mouse movement (free camera)
void SetCameraSmoothZoomControl(int keySmoothZoom);                   // Set camera smooth zoom key to combine with mouse (free camera)
void SetCameraMoveControls(int keyFront, int keyBack, int keyRight, int keyLeft, int keyUp, int keyDown); // Set camera move controls (1st person and 3rd person cameras)
```

module: shapes

```
// Set texture and rectangle to be used on shapes drawing
// NOTE: It can be useful when using basic shapes and one single font,
// defining a font char white rectangle would allow drawing everything in a single draw call
void SetShapesTexture(Texture2D texture, Rectangle source);

// Basic shapes drawing functions
void DrawPixel(int posX, int posY, Color color);                                                    // Draw a pixel
void DrawPixelV(Vector2 position, Color color);                                                     // Draw a pixel (Vector version)
void DrawLine(int startPosX, int startPosY, int endPosX, int endPosY, Color color);                 // Draw a line
void DrawLineV(Vector2 startPos, Vector2 endPos, Color color);                                      // Draw a line (Vector version)
void DrawLineEx(Vector2 startPos, Vector2 endPos, float thick, Color color);                        // Draw a line defining thickness
void DrawLineBezier(Vector2 startPos, Vector2 endPos, float thick, Color color);                    // Draw a line using cubic-bezier curves in-out
void DrawLineBezierQuad(Vector2 startPos, Vector2 endPos, Vector2 controlPos, float thick, Color color); //Draw line using quadratic bezier curves with a control point
void DrawLineBezierCubic(Vector2 startPos, Vector2 endPos, Vector2 startControlPos, Vector2 endControlPos, float thick, Color color); // Draw line using cubic bezier curves wi
void DrawLineStrip(Vector2 *points, int pointsCount, Color color);                                  // Draw lines sequence
void DrawCircle(int centerX, int centerY, float radius, Color color);                               // Draw a color-filled circle
void DrawCircleSector(Vector2 center, float radius, float startAngle, float endAngle, int segments, Color color);      // Draw a piece of a circle
void DrawCircleSectorLines(Vector2 center, float radius, float startAngle, float endAngle, int segments, Color color); // Draw circle sector outline
void DrawCircleGradient(int centerX, int centerY, float radius, Color color1, Color color2);       // Draw a gradient-filled circle
void DrawCircleV(Vector2 center, float radius, Color color);                                        // Draw a color-filled circle (Vector version)
void DrawCircleLines(int centerX, int centerY, float radius, Color color);                          // Draw circle outline
void DrawEllipse(int centerX, int centerY, float radiusH, float radiusV, Color color);              // Draw ellipse
void DrawEllipseLines(int centerX, int centerY, float radiusH, float radiusV, Color color);         // Draw ellipse outline
void DrawRing(Vector2 center, float innerRadius, float outerRadius, float startAngle, float endAngle, int segments, Color color); // Draw ring
void DrawRingLines(Vector2 center, float innerRadius, float outerRadius, float startAngle, float endAngle, int segments, Color color);    // Draw ring outline
void DrawRectangle(int posX, int posY, int width, int height, Color color);                         // Draw a color-filled rectangle
void DrawRectangleV(Vector2 position, Vector2 size, Color color);                                   // Draw a color-filled rectangle (Vector version)
void DrawRectangleRec(Rectangle rec, Color color);                                                  // Draw a color-filled rectangle
void DrawRectanglePro(Rectangle rec, Vector2 origin, float rotation, Color color);                  // Draw a color-filled rectangle with pro parameters
void DrawRectangleGradientV(int posX, int posY, int width, int height, Color color1, Color color2); // Draw a vertical-gradient-filled rectangle
void DrawRectangleGradientH(int posX, int posY, int width, int height, Color color1, Color color2); // Draw a horizontal-gradient-filled rectangle
void DrawRectangleGradientEx(Rectangle rec, Color col1, Color col2, Color col3, Color col4);        // Draw a gradient-filled rectangle with custom vertex colors
void DrawRectangleLines(int posX, int posY, int width, int height, Color color);                    // Draw rectangle outline
void DrawRectangleLinesEx(Rectangle rec, int lineThick, Color color);                               // Draw rectangle outline with extended parameters
void DrawRectangleRounded(Rectangle rec, float roundness, int segments, Color color);               // Draw rectangle with rounded edges
void DrawRectangleRoundedLines(Rectangle rec, float roundness, int segments, int lineThick, Color color); // Draw rectangle with rounded edges outline
void DrawTriangle(Vector2 v1, Vector2 v2, Vector2 v3, Color color);                                 // Draw a color-filled triangle (vertex in counter-clockwise order!)
void DrawTriangleLines(Vector2 v1, Vector2 v2, Vector2 v3, Color color);                            // Draw triangle outline (vertex in counter-clockwise order!)
void DrawTriangleFan(Vector2 *points, int pointsCount, Color color);                                // Draw a triangle fan defined by points (first vertex is the center)
void DrawTriangleStrip(Vector2 *points, int pointsCount, Color color);                              // Draw a triangle strip defined by points
void DrawPoly(Vector2 center, int sides, float radius, float rotation, Color color);                // Draw a regular polygon (Vector version)
void DrawPolyLines(Vector2 center, int sides, float radius, float rotation, Color color);           // Draw a polygon outline of n sides
void DrawPolyLinesEx(Vector2 center, int sides, float radius, float rotation, float lineThick, Color color); // Draw a polygon outline of n sides with extended parameters

// Basic shapes collision detection functions
bool CheckCollisionRecs(Rectangle rec1, Rectangle rec2);                                            // Check collision between two rectangles
bool CheckCollisionCircles(Vector2 center1, float radius1, Vector2 center2, float radius2);         // Check collision between two circles
bool CheckCollisionCircleRec(Vector2 center, float radius, Rectangle rec);                          // Check collision between circle and rectangle
bool CheckCollisionPointRec(Vector2 point, Rectangle rec);                                          // Check if point is inside rectangle
bool CheckCollisionPointCircle(Vector2 point, Vector2 center, float radius);                        // Check if point is inside circle
bool CheckCollisionPointTriangle(Vector2 point, Vector2 p1, Vector2 p2, Vector2 p3);                // Check if point is inside a triangle
bool CheckCollisionLines(Vector2 startPos1, Vector2 endPos1, Vector2 startPos2, Vector2 endPos2, Vector2 *collisionPoint); // Check the collision between two lines defined by
bool CheckCollisionPointLine(Vector2 point, Vector2 p1, Vector2 p2, int threshold);                 // Check if point belongs to line created between two points [p1] and [p2]
Rectangle GetCollisionRec(Rectangle rec1, Rectangle rec2);                                          // Get collision rectangle for two rectangles collision
```

module: textures

```
// Image loading functions
// NOTE: This functions do not require GPU access
Image LoadImage(const char *fileName);                                                      // Load image from file into CPU memory (RAM)
Image LoadImageRaw(const char *fileName, int width, int height, int format, int headerSize);       // Load image from RAW file data
Image LoadImageAnim(const char *fileName, int *frames);                                     // Load image sequence from file (frames appended to image.data)
Image LoadImageFromMemory(const char *fileType, const unsigned char *fileData, int dataSize);      // Load image from memory buffer
Image LoadImageFromTexture(Texture2D texture);                                              // Load image from GPU texture data
Image LoadImageFromScreen(void);                                                            // Load image from screen buffer and (screenshot)
void UnloadImage(Image image);                                                              // Unload image from CPU memory (RAM)
bool ExportImage(Image image, const char *fileName);                                        // Export image data to file, returns true on success
bool ExportImageAsCode(Image image, const char *fileName);                                  // Export image as code file defining an array of bytes, returns true on suc
```

```
// Image generation functions
Image GenImageColor(int width, int height, Color color);                                    // Generate image: plain color
Image GenImageGradientV(int width, int height, Color top, Color bottom);                    // Generate image: vertical gradient
Image GenImageGradientH(int width, int height, Color left, Color right);                    // Generate image: horizontal gradient
Image GenImageGradientRadial(int width, int height, float density, Color inner, Color outer);  // Generate image: radial gradient
Image GenImageChecked(int width, int height, int checksX, int checksY, Color col1, Color col2);  // Generate image: checked
Image GenImageWhiteNoise(int width, int height, float factor);                              // Generate image: white noise
Image GenImageCellular(int width, int height, int tileSize);                                // Generate image: cellular algorithm. Bigger tileSize means bigger cells

// Image manipulation functions
Image ImageCopy(Image image);                                                               // Create an image duplicate (useful for transformations)
Image ImageFromImage(Image image, Rectangle rec);                                           // Create an image from another image piece
Image ImageText(const char *text, int fontSize, Color color);                               // Create an image from text (default font)
Image ImageTextEx(Font font, const char *text, float fontSize, float spacing, Color tint);  // Create an image from text (custom sprite font)
void ImageFormat(Image *image, int newFormat);                                              // Convert image data to desired format
void ImageToPOT(Image *image, Color fill);                                                  // Convert image to POT (power-of-two)
void ImageCrop(Image *image, Rectangle crop);                                               // Crop an image to a defined rectangle
void ImageAlphaCrop(Image *image, float threshold);                                         // Crop image depending on alpha value
void ImageAlphaClear(Image *image, Color color, float threshold);                           // Clear alpha channel to desired color
void ImageAlphaMask(Image *image, Image alphaMask);                                         // Apply alpha mask to image
void ImageAlphaPremultiply(Image *image);                                                   // Premultiply alpha channel
void ImageResize(Image *image, int newWidth, int newHeight);                                // Resize image (Bicubic scaling algorithm)
void ImageResizeNN(Image *image, int newWidth,int newHeight);                               // Resize image (Nearest-Neighbor scaling algorithm)
void ImageResizeCanvas(Image *image, int newWidth, int newHeight, int offsetX, int offsetY, Color fill);  // Resize canvas and fill with color
void ImageMipmaps(Image *image);                                                            // Generate all mipmap levels for a provided image
void ImageDither(Image *image, int rBpp, int gBpp, int bBpp, int aBpp);                     // Dither image data to 16bpp or lower (Floyd-Steinberg dithering)
void ImageFlipVertical(Image *image);                                                       // Flip image vertically
void ImageFlipHorizontal(Image *image);                                                     // Flip image horizontally
void ImageRotateCW(Image *image);                                                           // Rotate image clockwise 90deg
void ImageRotateCCW(Image *image);                                                          // Rotate image counter-clockwise 90deg
void ImageColorTint(Image *image, Color color);                                             // Modify image color: tint
void ImageColorInvert(Image *image);                                                        // Modify image color: invert
void ImageColorGrayscale(Image *image);                                                     // Modify image color: grayscale
void ImageColorContrast(Image *image, float contrast);                                      // Modify image color: contrast (-100 to 100)
void ImageColorBrightness(Image *image, int brightness);                                    // Modify image color: brightness (-255 to 255)
void ImageColorReplace(Image *image, Color color, Color replace);                           // Modify image color: replace color
Color *LoadImageColors(Image image);                                                        // Load color data from image as a Color array (RGBA - 32bit)
Color *LoadImagePalette(Image image, int maxPaletteSize, int *colorsCount);                 // Load colors palette from image as a Color array (RGBA - 32bit)
void UnloadImageColors(Color *colors);                                                      // Unload color data loaded with LoadImageColors()
void UnloadImagePalette(Color *colors);                                                     // Unload colors palette loaded with LoadImagePalette()
Rectangle GetImageAlphaBorder(Image image, float threshold);                                // Get image alpha border rectangle
Color GetImageColor(Image image, int x, int y);                                             // Get image pixel color at (x, y) position

// Image drawing functions
// NOTE: Image software-rendering functions (CPU)
void ImageClearBackground(Image *dst, Color color);                                         // Clear image background with given color
void ImageDrawPixel(Image *dst, int posX, int posY, Color color);                           // Draw pixel within an image
void ImageDrawPixelV(Image *dst, Vector2 position, Color color);                            // Draw pixel within an image (Vector version)
void ImageDrawLine(Image *dst, int startPosX, int startPosY, int endPosX, int endPosY, Color color);  // Draw line within an image
void ImageDrawLineV(Image *dst, Vector2 start, Vector2 end, Color color);                   // Draw line within an image (Vector version)
void ImageDrawCircle(Image *dst, int centerX, int centerY, int radius, Color color);        // Draw circle within an image
void ImageDrawCircleV(Image *dst, Vector2 center, int radius, Color color);                 // Draw circle within an image (Vector version)
void ImageDrawRectangle(Image *dst, int posX, int posY, int width, int height, Color color);  // Draw rectangle within an image
void ImageDrawRectangleV(Image *dst, Vector2 position, Vector2 size, Color color);          // Draw rectangle within an image (Vector version)
void ImageDrawRectangleRec(Image *dst, Rectangle rec, Color color);                         // Draw rectangle within an image
void ImageDrawRectangleLines(Image *dst, Rectangle rec, int thick, Color color);            // Draw rectangle lines within an image
void ImageDraw(Image *dst, Image src, Rectangle srcRec, Rectangle dstRec, Color tint);      // Draw a source image within a destination image (tint applied to source)
void ImageDrawText(Image *dst, const char *text, int posX, int posY, int fontSize, Color color);  // Draw text (using default font) within an image (destination)
void ImageDrawTextEx(Image *dst, Font font, const char *text, Vector2 position, float fontSize, float spacing, Color tint); // Draw text (custom sprite font) within an image (

// Texture loading functions
// NOTE: These functions require GPU access
Texture2D LoadTexture(const char *fileName);                                                // Load texture from file into GPU memory (VRAM)
Texture2D LoadTextureFromImage(Image image);                                                // Load texture from image data
TextureCubemap LoadTextureCubemap(Image image, int layout);                                 // Load cubemap from image, multiple image cubemap layouts supported
RenderTexture2D LoadRenderTexture(int width, int height);                                   // Load texture for rendering (framebuffer)
void UnloadTexture(Texture2D texture);                                                      // Unload texture from GPU memory (VRAM)
void UnloadRenderTexture(RenderTexture2D target);                                           // Unload render texture from GPU memory (VRAM)
void UpdateTexture(Texture2D texture, const void *pixels);                                  // Update GPU texture with new data
void UpdateTextureRec(Texture2D texture, Rectangle rec, const void *pixels);                // Update GPU texture rectangle with new data

// Texture configuration functions
void GenTextureMipmaps(Texture2D *texture);                                                 // Generate GPU mipmaps for a texture
void SetTextureFilter(Texture2D texture, int filter);                                       // Set texture scaling filter mode
void SetTextureWrap(Texture2D texture, int wrap);                                           // Set texture wrapping mode

// Texture drawing functions
void DrawTexture(Texture2D texture, int posX, int posY, Color tint);                        // Draw a Texture2D
void DrawTextureV(Texture2D texture, Vector2 position, Color tint);                         // Draw a Texture2D with position defined as Vector2
void DrawTextureEx(Texture2D texture, Vector2 position, float rotation, float scale, Color tint);  // Draw a Texture2D with extended parameters
void DrawTextureRec(Texture2D texture, Rectangle source, Vector2 position, Color tint);     // Draw a part of a texture defined by a rectangle
void DrawTextureQuad(Texture2D texture, Vector2 tiling, Vector2 offset, Rectangle quad, Color tint);  // Draw texture quad with tiling and offset parameters
void DrawTextureTiled(Texture2D texture, Rectangle source, Rectangle dest, Vector2 origin, float rotation, float scale, Color tint);      // Draw part of a texture (defined by
void DrawTexturePro(Texture2D texture, Rectangle source, Rectangle dest, Vector2 origin, float rotation, Color tint);          // Draw a part of a texture defined by a rectan
void DrawTextureNPatch(Texture2D texture, NPatchInfo nPatchInfo, Rectangle dest, Vector2 origin, float rotation, Color tint);   // Draws a texture (or part of it) that stretch
void DrawTexturePoly(Texture2D texture, Vector2 center, Vector2 *points, Vector2 *texcoords, int pointsCount, Color tint);      // Draw a textured polygon

// Color/pixel related functions
Color Fade(Color color, float alpha);                                                       // Returns color with alpha applied, alpha goes from 0.0f to 1.0f
int ColorToInt(Color color);                                                                // Returns hexadecimal value for a Color
Vector4 ColorNormalize(Color color);                                                        // Returns Color normalized as float [0..1]
Color ColorFromNormalized(Vector4 normalized);                                              // Returns Color from normalized values [0..1]
Vector3 ColorToHSV(Color color);                                                            // Returns HSV values for a Color, hue [0..360], saturation/value [0..1]
Color ColorFromHSV(float hue, float saturation, float value);                               // Returns a Color from HSV values, hue [0..360], saturation/value [0..1]
Color ColorAlpha(Color color, float alpha);                                                 // Returns color with alpha applied, alpha goes from 0.0f to 1.0f
Color ColorAlphaBlend(Color dst, Color src, Color tint);                                    // Returns src alpha-blended into dst color with tint
Color GetColor(unsigned int hexValue);                                                      // Get Color structure from hexadecimal value
Color GetPixelColor(void *srcPtr, int format);                                              // Get Color from a source pixel pointer of certain format
void SetPixelColor(void *dstPtr, Color color, int format);                                  // Set color formatted into destination pixel pointer
int GetPixelDataSize(int width, int height, int format);                                    // Get pixel data size in bytes for certain format
```

module: text

```
// Font loading/unloading functions
Font GetFontDefault(void);                                                                  // Get the default Font
Font LoadFont(const char *fileName);                                                        // Load font from file into GPU memory (VRAM)
Font LoadFontEx(const char *fileName, int fontSize, int *fontChars, int glyphCount);        // Load font from file with extended parameters
Font LoadFontFromImage(Image image, Color key, int firstChar);                              // Load font from Image (XNA style)
Font LoadFontFromMemory(const char *fileType, const unsigned char *fileData, int dataSize, int fontSize, int *fontChars, int glyphCount); // Load font from memory buffer, fil
GlyphInfo *LoadFontData(const unsigned char *fileData, int dataSize, int fontSize, int *fontChars, int glyphCount, int type);      // Load font data for further use
Image GenImageFontAtlas(const GlyphInfo *chars, Rectangle **recs, int glyphCount, int fontSize, int padding, int packMethod);      // Generate image font atlas using chars inf
void UnloadFontData(GlyphInfo *chars, int glyphCount);                                      // Unload font chars info data (RAM)
void UnloadFont(Font font);                                                                 // Unload Font from GPU memory (VRAM)

// Text drawing functions
void DrawFPS(int posX, int posY);                                                           // Draw current FPS
void DrawText(const char *text, int posX, int posY, int fontSize, Color color);             // Draw text (using default font)
void DrawTextEx(Font font, const char *text, Vector2 position, float fontSize, float spacing, Color tint);  // Draw text using font and additional parameters
void DrawTextPro(Font font, const char *text, Vector2 position, Vector2 origin, float rotation, float fontSize, float spacing, Color tint); // Draw text using Font and pro par
void DrawTextCodepoint(Font font, int codepoint, Vector2 position, float fontSize, Color tint); // Draw one character (codepoint)

// Text misc. functions
int MeasureText(const char *text, int fontSize);                                            // Measure string width for default font
Vector2 MeasureTextEx(Font font, const char *text, float fontSize, float spacing);          // Measure string size for Font
int GetGlyphIndex(Font font, int codepoint);                                                // Get glyph index position in font for a codepoint (unicode character), fallba
GlyphInfo GetGlyphInfo(Font font, int codepoint);                                           // Get glyph font info data for a codepoint (unicode character), fallback to '?
Rectangle GetGlyphAtlasRec(Font font, int codepoint);                                       // Get glyph rectangle in font atlas for a codepoint (unicode character), fallb

// Text codepoints management functions (unicode characters)
int *LoadCodepoints(const char *text, int *count);                                          // Load all codepoints from a UTF-8 text string, codepoints count returned by p
void UnloadCodepoints(int *codepoints);                                                     // Unload codepoints data from memory
int GetCodepointCount(const char *text);                                                    // Get total number of codepoints in a UTF-8 encoded string
int GetCodepoint(const char *text, int *bytesProcessed);                                    // Get next codepoint in a UTF-8 encoded string, 0x3f('?') is returned on failu
const char *CodepointToUTF8(int codepoint, int *byteSize);                                  // Encode one codepoint into UTF-8 byte array (array length returned as paramet
char *TextCodepointsToUTF8(int *codepoints, int length);                                    // Encode text as codepoints array into UTF-8 text string (WARNING: memory must

// Text strings management functions (no utf8 strings, only byte chars)
// NOTE: Some strings allocate memory internally for returned strings, just be careful!
int TextCopy(char *dst, const char *src);                                                   // Copy one string to another, returns bytes copied
bool TextIsEqual(const char *text1, const char *text2);                                     // Check if two text string are equal
unsigned int TextLength(const char *text);                                                  // Get text length, checks for '\0' ending
const char *TextFormat(const char *text, ...);                                              // Text formatting with variables (sprintf style)
const char *TextSubtext(const char *text, int position, int length);                        // Get a piece of a text string
char *TextReplace(char *text, const char *replace, const char *by);                         // Replace text string (memory must be freed!)
char *TextInsert(const char *text, const char *insert, int position);                       // Insert text in a position (memory must be freed!)
const char *TextJoin(const char **textList, int count, const char *delimiter);             // Join text strings with delimiter
const char **TextSplit(const char *text, char delimiter, int *count);                       // Split text into multiple strings
void TextAppend(char *text, const char *append, int *position);                             // Append text at specific position and move cursor!
int TextFindIndex(const char *text, const char *find);                                      // Find first text occurrence within a string
const char *TextToUpper(const char *text);                                                  // Get upper case version of provided string
const char *TextToLower(const char *text);                                                  // Get lower case version of provided string
```

```
const char *TextToPascal(const char *text);                                 // Get Pascal case notation version of provided string
int TextToInteger(const char *text);                                        // Get integer value from text (negative values not supported)
```

module: models

```
// Basic geometric 3D shapes drawing functions
void DrawLine3D(Vector3 startPos, Vector3 endPos, Color color);                                         // Draw a line in 3D world space
void DrawPoint3D(Vector3 position, Color color);                                                        // Draw a point in 3D space, actually a small line
void DrawCircle3D(Vector3 center, float radius, Vector3 rotationAxis, float rotationAngle, Color color); // Draw a circle in 3D world space
void DrawTriangle3D(Vector3 v1, Vector3 v2, Vector3 v3, Color color);                                   // Draw a color-filled triangle (vertex in counter-clockwise order!)
void DrawTriangleStrip3D(Vector3 *points, int pointsCount, Color color);                                // Draw a triangle strip defined by points
void DrawCube(Vector3 position, float width, float height, float length, Color color);                  // Draw cube
void DrawCubeV(Vector3 position, Vector3 size, Color color);                                            // Draw cube (Vector version)
void DrawCubeWires(Vector3 position, float width, float height, float length, Color color);             // Draw cube wires
void DrawCubeWiresV(Vector3 position, Vector3 size, Color color);                                       // Draw cube wires (Vector version)
void DrawCubeTexture(Texture2D texture, Vector3 position, float width, float height, float length, Color color); // Draw cube textured
void DrawCubeTextureRec(Texture2D texture, Rectangle source, Vector3 position, float width, float height, float length, Color color); // Draw cube with a region of a texture
void DrawSphere(Vector3 centerPos, float radius, Color color);                                          // Draw sphere
void DrawSphereEx(Vector3 centerPos, float radius, int rings, int slices, Color color);                 // Draw sphere with extended parameters
void DrawSphereWires(Vector3 centerPos, float radius, int rings, int slices, Color color);              // Draw sphere wires
void DrawCylinder(Vector3 position, float radiusTop, float radiusBottom, float height, int slices, Color color);        // Draw a cylinder/cone
void DrawCylinderEx(Vector3 startPos, Vector3 endPos, float startRadius, float endRadius, int sides, Color color);      // Draw a cylinder with base at startPos and top at enc
void DrawCylinderWires(Vector3 position, float radiusTop, float radiusBottom, float height, int slices, Color color);   // Draw a cylinder/cone wires
void DrawCylinderWiresEx(Vector3 startPos, Vector3 endPos, float startRadius, float endRadius, int sides, Color color); // Draw a cylinder wires with base at startPos and top
void DrawPlane(Vector3 centerPos, Vector2 size, Color color);                                           // Draw a plane XZ
void DrawRay(Ray ray, Color color);                                                                     // Draw a ray line
void DrawGrid(int slices, float spacing);                                                               // Draw a grid (centered at (0, 0, 0))

// Model loading/unloading functions
Model LoadModel(const char *fileName);                                                                  // Load model from files (meshes and materials)
Model LoadModelFromMesh(Mesh mesh);                                                                     // Load model from generated mesh (default material)
void UnloadModel(Model model);                                                                          // Unload model (including meshes) from memory (RAM and/or VRAM)
void UnloadModelKeepMeshes(Model model);                                                                // Unload model (but not meshes) from memory (RAM and/or VRAM)
BoundingBox GetModelBoundingBox(Model model);                                                           // Compute model bounding box limits (considers all meshes)

// Model drawing functions
void DrawModel(Model model, Vector3 position, float scale, Color tint);                                 // Draw a model (with texture if set)
void DrawModelEx(Model model, Vector3 position, Vector3 rotationAxis, float rotationAngle, Vector3 scale, Color tint); // Draw a model with extended parameters
void DrawModelWires(Model model, Vector3 position, float scale, Color tint);                            // Draw a model wires (with texture if set)
void DrawModelWiresEx(Model model, Vector3 position, Vector3 rotationAxis, float rotationAngle, Vector3 scale, Color tint); // Draw a model wires (with texture if set) with ex
void DrawBoundingBox(BoundingBox box, Color color);                                                     // Draw bounding box (wires)
void DrawBillboard(Camera camera, Texture2D texture, Vector3 position, float size, Color tint);         // Draw a billboard texture
void DrawBillboardRec(Camera camera, Texture2D texture, Rectangle source, Vector3 position, Vector2 size, Color tint); // Draw a billboard texture defined by source
void DrawBillboardPro(Camera camera, Texture2D texture, Rectangle source, Vector3 position, Vector3 up, Vector2 size, Vector2 origin, float rotation, Color tint); // Draw a bi

// Mesh management functions
void UploadMesh(Mesh *mesh, bool dynamic);                                                              // Upload mesh vertex data in GPU and provide VAO/VBO ids
void UpdateMeshBuffer(Mesh mesh, int index, void *data, int dataSize, int offset);                      // Update mesh vertex data in GPU for a specific buffer index
void UnloadMesh(Mesh mesh);                                                                             // Unload mesh data from CPU and GPU
void DrawMesh(Mesh mesh, Material material, Matrix transform);                                          // Draw a 3d mesh with material and transform
void DrawMeshInstanced(Mesh mesh, Material material, Matrix *transforms, int instances);                // Draw multiple mesh instances with material and different transforms
bool ExportMesh(Mesh mesh, const char *fileName);                                                       // Export mesh data to file, returns true on success
BoundingBox GetMeshBoundingBox(Mesh mesh);                                                              // Compute mesh bounding box limits
void GenMeshTangents(Mesh *mesh);                                                                       // Compute mesh tangents
void GenMeshBinormals(Mesh *mesh);                                                                      // Compute mesh binormals

// Mesh generation functions
Mesh GenMeshPoly(int sides, float radius);                                                              // Generate polygonal mesh
Mesh GenMeshPlane(float width, float length, int resX, int resZ);                                       // Generate plane mesh (with subdivisions)
Mesh GenMeshCube(float width, float height, float length);                                              // Generate cuboid mesh
Mesh GenMeshSphere(float radius, int rings, int slices);                                                // Generate sphere mesh (standard sphere)
Mesh GenMeshHemiSphere(float radius, int rings, int slices);                                            // Generate half-sphere mesh (no bottom cap)
Mesh GenMeshCylinder(float radius, float height, int slices);                                           // Generate cylinder mesh
Mesh GenMeshCone(float radius, float height, int slices);                                               // Generate cone/pyramid mesh
Mesh GenMeshTorus(float radius, float size, int radSeg, int sides);                                     // Generate torus mesh
Mesh GenMeshKnot(float radius, float size, int radSeg, int sides);                                      // Generate trefoil knot mesh
Mesh GenMeshHeightmap(Image heightmap, Vector3 size);                                                   // Generate heightmap mesh from image data
Mesh GenMeshCubicmap(Image cubicmap, Vector3 cubeSize);                                                 // Generate cubes-based map mesh from image data

// Material loading/unloading functions
Material *LoadMaterials(const char *fileName, int *materialCount);                                      // Load materials from model file
Material LoadMaterialDefault(void);                                                                     // Load default material (Supports: DIFFUSE, SPECULAR, NORMAL maps)
void UnloadMaterial(Material material);                                                                 // Unload material from GPU memory (VRAM)
void SetMaterialTexture(Material *material, int mapType, Texture2D texture);                            // Set texture for a material map type (MATERIAL_MAP_DIFFUSE, MATERIAL_MAP_S
void SetModelMeshMaterial(Model *model, int meshId, int materialId);                                    // Set material for a mesh

// Model animations loading/unloading functions
ModelAnimation *LoadModelAnimations(const char *fileName, unsigned int *animCount);                     // Load model animations from file
void UpdateModelAnimation(Model model, ModelAnimation anim, int frame);                                 // Update model animation pose
void UnloadModelAnimation(ModelAnimation anim);                                                         // Unload animation data
void UnloadModelAnimations(ModelAnimation* animations, unsigned int count);                             // Unload animation array data
bool IsModelAnimationValid(Model model, ModelAnimation anim);                                           // Check model animation skeleton match

// Collision detection functions
bool CheckCollisionSpheres(Vector3 center1, float radius1, Vector3 center2, float radius2);             // Check collision between two spheres
bool CheckCollisionBoxes(BoundingBox box1, BoundingBox box2);                                           // Check collision between two bounding boxes
bool CheckCollisionBoxSphere(BoundingBox box, Vector3 center, float radius);                            // Check collision between box and sphere
RayCollision GetRayCollisionSphere(Ray ray, Vector3 center, float radius);                              // Get collision info between ray and sphere
RayCollision GetRayCollisionBox(Ray ray, BoundingBox box);                                              // Get collision info between ray and box
RayCollision GetRayCollisionModel(Ray ray, Model model);                                                // Get collision info between ray and model
RayCollision GetRayCollisionMesh(Ray ray, Mesh mesh, Matrix transform);                                 // Get collision info between ray and mesh
RayCollision GetRayCollisionTriangle(Ray ray, Vector3 p1, Vector3 p2, Vector3 p3);                      // Get collision info between ray and triangle
RayCollision GetRayCollisionQuad(Ray ray, Vector3 p1, Vector3 p2, Vector3 p3, Vector3 p4);              // Get collision info between ray and quad
```

module: audio

```
// Audio device management functions
void InitAudioDevice(void);                                                 // Initialize audio device and context
void CloseAudioDevice(void);                                                // Close the audio device and context
bool IsAudioDeviceReady(void);                                              // Check if audio device has been initialized successfully
void SetMasterVolume(float volume);                                         // Set master volume (listener)

// Wave/Sound loading/unloading functions
Wave LoadWave(const char *fileName);                                        // Load wave data from file
Wave LoadWaveFromMemory(const char *fileType, const unsigned char *fileData, int dataSize); // Load wave from memory buffer
Sound LoadSound(const char *fileName);                                      // Load sound from file
Sound LoadSoundFromWave(Wave wave);                                         // Load sound from wave data
void UpdateSound(Sound sound, const void *data, int samplesCount);          // Update sound buffer with new data
void UnloadWave(Wave wave);                                                 // Unload wave data
void UnloadSound(Sound sound);                                              // Unload sound
bool ExportWave(Wave wave, const char *fileName);                           // Export wave data to file, returns true on success
bool ExportWaveAsCode(Wave wave, const char *fileName);                     // Export wave sample data to code (.h), returns true on success

// Wave/Sound management functions
void PlaySound(Sound sound);                                                // Play a sound
void StopSound(Sound sound);                                                // Stop playing a sound
void PauseSound(Sound sound);                                               // Pause a sound
void ResumeSound(Sound sound);                                              // Resume a paused sound
void PlaySoundMulti(Sound sound);                                           // Play a sound (using multichannel buffer pool)
void StopSoundMulti(void);                                                  // Stop any sound playing (using multichannel buffer pool)
int GetSoundsPlaying(void);                                                 // Get number of sounds playing in the multichannel
bool IsSoundPlaying(Sound sound);                                           // Check if a sound is currently playing
void SetSoundVolume(Sound sound, float volume);                             // Set volume for a sound (1.0 is max level)
void SetSoundPitch(Sound sound, float pitch);                               // Set pitch for a sound (1.0 is base level)
void WaveFormat(Wave *wave, int sampleRate, int sampleSize, int channels);  // Convert wave data to desired format
Wave WaveCopy(Wave wave);                                                   // Copy a wave to a new wave
void WaveCrop(Wave *wave, int initSample, int finalSample);                 // Crop a wave to defined samples range
float *LoadWaveSamples(Wave wave);                                          // Load samples data from wave as a floats array
void UnloadWaveSamples(float *samples);                                     // Unload samples data loaded with LoadWaveSamples()

// Music management functions
Music LoadMusicStream(const char *fileName);                                // Load music stream from file
Music LoadMusicStreamFromMemory(const char *fileType, unsigned char *data, int dataSize); // Load music stream from data
void UnloadMusicStream(Music music);                                        // Unload music stream
void PlayMusicStream(Music music);                                          // Start music playing
bool IsMusicStreamPlaying(Music music);                                     // Check if music is playing
void UpdateMusicStream(Music music);                                        // Updates buffers for music streaming
void StopMusicStream(Music music);                                          // Stop music playing
void PauseMusicStream(Music music);                                         // Pause music playing
void ResumeMusicStream(Music music);                                        // Resume playing paused music
void SeekMusicStream(Music music, float position);                          // Seek music to a position (in seconds)
void SetMusicVolume(Music music, float volume);                             // Set volume for music (1.0 is max level)
void SetMusicPitch(Music music, float pitch);                               // Set pitch for a music (1.0 is base level)
float GetMusicTimeLength(Music music);                                      // Get music time length (in seconds)
float GetMusicTimePlayed(Music music);                                      // Get current music time played (in seconds)

// AudioStream management functions
```

```
AudioStream InitAudioStream(unsigned int sampleRate, unsigned int sampleSize, unsigned int channels); // Init audio stream (to stream raw audio pcm data)
void UpdateAudioStream(AudioStream stream, const void *data, int samplesCount); // Update audio stream buffers with data
void CloseAudioStream(AudioStream stream);                                     // Close audio stream and free memory
bool IsAudioStreamProcessed(AudioStream stream);                               // Check if any audio stream buffers requires refill
void PlayAudioStream(AudioStream stream);                                      // Play audio stream
void PauseAudioStream(AudioStream stream);                                     // Pause audio stream
void ResumeAudioStream(AudioStream stream);                                    // Resume audio stream
bool IsAudioStreamPlaying(AudioStream stream);                                 // Check if audio stream is playing
void StopAudioStream(AudioStream stream);                                      // Stop audio stream
void SetAudioStreamVolume(AudioStream stream, float volume);                   // Set volume for audio stream (1.0 is max level)
void SetAudioStreamPitch(AudioStream stream, float pitch);                     // Set pitch for audio stream (1.0 is base level)
void SetAudioStreamBufferSizeDefault(int size);                                // Default size for new audio streams
```

structs

```
struct Vector2;          // Vector2 type
struct Vector3;          // Vector3 type
struct Vector4;          // Vector4 type
struct Quaternion;       // Quaternion type
struct Matrix;           // Matrix type (OpenGL style 4x4)
struct Color;            // Color type, RGBA (32bit)
struct Rectangle;        // Rectangle type

struct Image;            // Image type (multiple pixel formats supported)
                         // NOTE: Data stored in CPU memory (RAM)
struct Texture;          // Texture type (multiple internal formats supported)
                         // NOTE: Data stored in GPU memory (VRAM)
struct RenderTexture;    // RenderTexture type, for texture rendering
struct NPatchInfo;       // N-Patch layout info
struct GlyphInfo;        // Font character glyph info
struct Font;             // Font type, includes texture and chars data

struct Camera;           // Camera type, defines 3d camera position/orientation
struct Camera2D;         // Camera2D type, defines a 2d camera
struct Mesh;             // Vertex data definning a mesh
struct Shader;           // Shader type (generic shader)
struct MaterialMap;      // Material texture map
struct Material;         // Material type
struct Model;            // Basic 3d Model type
struct Transform;        // Transformation (used for bones)
struct BoneInfo;         // Bone information
struct ModelAnimation;   // Model animation data (bones and frames)
struct Ray;              // Ray type (useful for raycast)
struct RayCollision;     // Raycast hit information
struct BoundingBox;      // Bounding box type for 3d mesh

struct Wave;             // Wave type, defines audio wave data
struct Sound;            // Basic Sound source and buffer
struct Music;            // Music type (file streaming from memory)
struct AudioStream;      // Raw audio stream type

struct VrDeviceInfo;     // VR device parameters
struct VrStereoConfig;   // VR Stereo rendering configuration for simulator
```

colors

```
// Custom raylib color palette for amazing visuals
#define LIGHTGRAY  (Color){ 200, 200, 200, 255 }   // Light Gray
#define GRAY       (Color){ 130, 130, 130, 255 }   // Gray
#define DARKGRAY   (Color){ 80, 80, 80, 255 }      // Dark Gray
#define YELLOW     (Color){ 253, 249, 0, 255 }     // Yellow
#define GOLD       (Color){ 255, 203, 0, 255 }     // Gold
#define ORANGE     (Color){ 255, 161, 0, 255 }     // Orange
#define PINK       (Color){ 255, 109, 194, 255 }   // Pink
#define RED        (Color){ 230, 41, 55, 255 }     // Red
#define MAROON     (Color){ 190, 33, 55, 255 }     // Maroon
#define GREEN      (Color){ 0, 228, 48, 255 }      // Green
#define LIME       (Color){ 0, 158, 47, 255 }      // Lime
#define DARKGREEN  (Color){ 0, 117, 44, 255 }      // Dark Green
#define SKYBLUE    (Color){ 102, 191, 255, 255 }   // Sky Blue
#define BLUE       (Color){ 0, 121, 241, 255 }     // Blue
#define DARKBLUE   (Color){ 0, 82, 172, 255 }      // Dark Blue
#define PURPLE     (Color){ 200, 122, 255, 255 }   // Purple
#define VIOLET     (Color){ 135, 60, 190, 255 }    // Violet
#define DARKPURPLE (Color){ 112, 31, 126, 255 }    // Dark Purple
#define BEIGE      (Color){ 211, 176, 131, 255 }   // Beige
#define BROWN      (Color){ 127, 106, 79, 255 }    // Brown
#define DARKBROWN  (Color){ 76, 63, 47, 255 }      // Dark Brown

#define WHITE      (Color){ 255, 255, 255, 255 }   // White
#define BLACK      (Color){ 0, 0, 0, 255 }         // Black
#define BLANK      (Color){ 0, 0, 0, 0 }           // Transparent
#define MAGENTA    (Color){ 255, 0, 255, 255 }     // Magenta
#define RAYWHITE   (Color){ 245, 245, 245, 255 }   // Ray White
```