# legend

color: Color(r,g,b,a=255)  
vec: Vector3 / Vector4  
mat: Matrix  
tex: Material / RTT / texture handle  
rtt: Render Target  
texHandle: texture handle  
eye,at,up: Vector3  
key: “a” or KEY\_SPACE etc.  
su,tv: UV coordinates (floats)  
nx,ny,nz: normals

# EVENTS

\_init()  
\_shutdown()  
\_update(dt)  
\_render()  
\_render2D()

# Base

ShowMessage(caption, text)  
LogString(text)  
ExitGame()  
RestartGame()  
IsDebugMode()  
SetFPS(fps)  
dofile(scriptName)  
loadfile(fileName)  
getTime()

# Math

Color(r,g,b,a=255)  
ColorLinear(r,g,b,a=1.0)  
str2vec(text)  
vec2str(vec)

## Matrix

Matrix()  
translate(x,y,z)  
rotate(x,y,z)  
scale(x,y,z)  
inverse()  
shadow(planeVec,lightVec)  
reflect(planeVec)  
lookAt(eye,at,up)  
m(row,col)  
row(index)  
col(index)

bind(kind)

## Vector

Vector3(x,y,z)

Vector4(x,y,z,w)

cross(vec)

get()

color()

mag()

magSq()

lerp(b,t)

neg()

normalize()

m(index,val)

x(),y(),z(),w()

# Renderer

ClearScene(color)

CameraPerspective(fov,near,far,flipLH)

CameraOrthographic(w,h,near,fart,flipLH)

BindTexture(tex)

GetResolution()

GetMatrix(kind)

RenderState(kind,state)

ToggleWireframe(state)

SetFog(color,kind,start,end)

SetFog(color,kind,density)

ClearFog()

SamplerState(stage,kind,state)

EnableLighting(state)

AmbientColor(color)

ClearTarget()

DrawBox(mat,dims,color)

DrawQuad(x1,x2,y1,y2,color,flipY)

CullMode(mode)

FillScreen(color,flipY)

RegisterFontFile(path)

## scene

Scene(modelName,loadMaterials=true,optimizeMesh=false)

draw(mat)

drawSubset(index,mat)

loadModel(modelName,loadMaterials=true,optimizeMesh=false)

loadScene(modelName,loadMaterials=true,optimizeMesh=false)

getMeshes()

getLights()

getFlattenNodes()

getTargets()

findMesh(name)

findLight(name)

findTarget(name)

getRootNode()

## NODE

Node()

clone()

getName()  
setName(name)

getTransform()

setTransform(mat)

getFinalTransform()

addNode(node)

addMesh(mesh)

draw(mat)

drawSubset(index, mat)

getMeshes()  
getMeshParts()

getLights()

getTargets()  
getNodes()

findMesh(name)

findLight(name)

findTarget(name)  
findNode(name)  
getMeta(name)

## mesh

Mesh()  
addFGroup(part)  
addPart(part)  
draw(mat)  
clone()  
getFGroups()  
getParts()  
clear()  
setName(name)  
getName()  
setMaterial(stage,tex)  
getMaterial(stage)

## part / facegroup

FaceGroup()  
clone()  
addVertex(vert)  
addIndex(index)  
addTriangle(a,b,c)  
setMaterial(stage,mat)  
getMaterial(stage)  
getMaterialStage()  
draw(mat)  
build()  
calcNormals()  
clear()  
getVertices()  
getIndices()

## material

Material()  
Material(textureName)  
Material(w,h)  
setSamplerState(sampler,state)  
getSamplerState(sampler)  
loadFile(textureName)  
res()  
data()  
getHandle(slot)  
setHandle(slot,texHandle)  
setDiffuse(color)  
setAmbient(color)  
setSpecular(color)  
setEmission(color)  
setPower(val)  
setOpacity(val)  
alphaIsTransparency(state)  
setShaded(state)

## Vertex

Vertex(x,y,z,su,tv,color,nx,ny,nz)  
get()

## font

Font(fontFamily)  
drawText(color,text,x,y,w=0,h=0)

## render target

RenderTarget()  
RenderTarget(w,h)  
RenderTarget(w,h,hasDepth=false)  
getHandle()  
bind()

## effect

Effect(effectPath)  
begin(technique)  
end(),flush()  
beginPass(pass)  
endPass()  
commit()  
setBool(name,val)  
setFloat(name,val)  
setMatrix(name,mat)  
setVector3(name,vec)  
setVector4(name,vec)  
setInteger(name,val)  
setTexture(name,texHandle)  
setTexture(name,slot,mat)  
setTexture(name,rtt)

## light

Light(slot)  
enable(state,slot)  
setPosition(vec)  
setDirection(vec)

setDiffuse(color)

setSpecular(color)

setAmbient(color)

setRange(val)

setFalloff(val)

setAttenuation(a,b,c)

setInnerAngle(val)

setOuterAngle(val)  
setType(kind)

setSlot(slot)

getType()  
getSlot()

# input

GetKey(key)  
GetKeyDown(key)  
GetKeyUp(key)  
GetMouseXY()

GetMouseDelta()  
SetMouseXY(x,y)

GetMouse(button)  
GetMouseDown(button)

GetMouseUp(button)

IsCursorVisible()  
ShowCursor(state)  
GetCursorMode()  
SetCursorMode(mode)  
ShowCursor(state)

# globals

## renderer

PRIMITIVEKIND\_POINTLIST

PRIMITIVEKIND\_LINELIST

PRIMITIVEKIND\_LINESTRIP

PRIMITIVEKIND\_TRIANGLELIST

PRIMITIVEKIND\_TRIANGLESTRIP

PRIMITIVEKIND\_TRIANGLEFAN

MATRIXKIND\_VIEW

MATRIXKIND\_PROJECTION

MATRIXKIND\_TEXTURE0

MATRIXKIND\_TEXTURE1

MATRIXKIND\_TEXTURE2

MATRIXKIND\_TEXTURE3

MATRIXKIND\_TEXTURE4

MATRIXKIND\_TEXTURE5

MATRIXKIND\_TEXTURE6

MATRIXKIND\_TEXTURE7

MATRIXKIND\_WORLD

CLEARFLAG\_COLOR

CLEARFLAG\_DEPTH

CLEARFLAG\_STENCIL

CLEARFLAG\_STANDARD

TEXTURESLOT\_ALBEDO

TEXTURESLOT\_SPECULAR

TEXTURESLOT\_NORMAL

TEXTURESLOT\_DISPLACE

TEXTURESLOT\_USER\_END

MAX\_TEXTURE\_SLOTS  
  
FOGKIND\_NONE

FOGKIND\_EXP

FOGKIND\_EXP2

FOGKIND\_LINEAR  
  
WORLD

VIEW

PROJ  
  
CULLKIND\_NONE

CULLKIND\_CW

CULLKIND\_CCW  
  
LIGHTKIND\_DIRECTIONAL

LIGHTKIND\_POINT

LIGHTKIND\_SPOT  
  
RENDERSTATE\_ZENABLE

RENDERSTATE\_FILLMODE

RENDERSTATE\_SHADEMODE

RENDERSTATE\_ZWRITEENABLE

RENDERSTATE\_ALPHATESTENABLE

RENDERSTATE\_LASTPIXEL

RENDERSTATE\_SRCBLEND

RENDERSTATE\_DESTBLEND

RENDERSTATE\_CULLMODE

RENDERSTATE\_ZFUNC

RENDERSTATE\_ALPHAREF

RENDERSTATE\_ALPHAFUNC

RENDERSTATE\_DITHERENABLE

RENDERSTATE\_ALPHABLENDENABLE

RENDERSTATE\_FOGENABLE

RENDERSTATE\_SPECULARENABLE

RENDERSTATE\_FOGCOLOR

RENDERSTATE\_FOGTABLEMODE

RENDERSTATE\_FOGSTART

RENDERSTATE\_FOGEND

RENDERSTATE\_FOGDENSITY

RENDERSTATE\_RANGEFOGENABLE

RENDERSTATE\_STENCILENABLE

RENDERSTATE\_STENCILFAIL

RENDERSTATE\_STENCILZFAIL

RENDERSTATE\_STENCILPASS

RENDERSTATE\_STENCILFUNC

RENDERSTATE\_STENCILREF

RENDERSTATE\_STENCILMASK

RENDERSTATE\_STENCILWRITEMASK

RENDERSTATE\_TEXTUREFACTOR

RENDERSTATE\_WRAP0

RENDERSTATE\_WRAP1

RENDERSTATE\_WRAP2

RENDERSTATE\_WRAP3

RENDERSTATE\_WRAP4

RENDERSTATE\_WRAP5

RENDERSTATE\_WRAP6

RENDERSTATE\_WRAP7

RENDERSTATE\_CLIPPING

RENDERSTATE\_LIGHTING

RENDERSTATE\_AMBIENT

RENDERSTATE\_FOGVERTEXMODE

RENDERSTATE\_COLORVERTEX

RENDERSTATE\_LOCALVIEWER

RENDERSTATE\_NORMALIZENORMALS

RENDERSTATE\_DIFFUSEMATERIALSOURCE

RENDERSTATE\_SPECULARMATERIALSOURCE

RENDERSTATE\_AMBIENTMATERIALSOURCE

RENDERSTATE\_EMISSIVEMATERIALSOURCE

RENDERSTATE\_VERTEXBLEND

RENDERSTATE\_CLIPPLANEENABLE

RENDERSTATE\_POINTSIZE

RENDERSTATE\_POINTSIZE\_MIN

RENDERSTATE\_POINTSPRITEENABLE

RENDERSTATE\_POINTSCALEENABLE

RENDERSTATE\_POINTSCALE\_A

RENDERSTATE\_POINTSCALE\_B

RENDERSTATE\_POINTSCALE\_C

RENDERSTATE\_MULTISAMPLEANTIALIAS

RENDERSTATE\_MULTISAMPLEMASK

RENDERSTATE\_PATCHEDGESTYLE

RENDERSTATE\_DEBUGMONITORTOKEN

RENDERSTATE\_POINTSIZE\_MAX

RENDERSTATE\_INDEXEDVERTEXBLENDENABLE

RENDERSTATE\_COLORWRITEENABLE

RENDERSTATE\_TWEENFACTOR

RENDERSTATE\_BLENDOP

RENDERSTATE\_NORMALDEGREE

RENDERSTATE\_SCISSORTESTENABLE

RENDERSTATE\_SLOPESCALEDEPTHBIAS

RENDERSTATE\_ANTIALIASEDLINEENABLE

RENDERSTATE\_MINTESSELLATIONLEVEL

RENDERSTATE\_MAXTESSELLATIONLEVEL

RENDERSTATE\_ADAPTIVETESS\_X

RENDERSTATE\_ADAPTIVETESS\_Y

RENDERSTATE\_ADAPTIVETESS\_Z

RENDERSTATE\_ADAPTIVETESS\_W

RENDERSTATE\_ENABLEADAPTIVETESSELLATION

RENDERSTATE\_TWOSIDEDSTENCILMODE

RENDERSTATE\_CCW\_STENCILFAIL

RENDERSTATE\_CCW\_STENCILZFAIL

RENDERSTATE\_CCW\_STENCILPASS

RENDERSTATE\_CCW\_STENCILFUNC

RENDERSTATE\_COLORWRITEENABLE1

RENDERSTATE\_COLORWRITEENABLE2

RENDERSTATE\_COLORWRITEENABLE3

RENDERSTATE\_BLENDFACTOR

RENDERSTATE\_SRGBWRITEENABLE

RENDERSTATE\_DEPTHBIAS

RENDERSTATE\_WRAP8

RENDERSTATE\_WRAP9

RENDERSTATE\_WRAP10

RENDERSTATE\_WRAP11

RENDERSTATE\_WRAP12

RENDERSTATE\_WRAP13

RENDERSTATE\_WRAP14

RENDERSTATE\_WRAP15

RENDERSTATE\_SEPARATEALPHABLENDENABLE

RENDERSTATE\_SRCBLENDALPHA

RENDERSTATE\_DESTBLENDALPHA

RENDERSTATE\_BLENDOPALPHA  
  
SAMPLERSTATE\_ADDRESSU

SAMPLERSTATE\_ADDRESSV

SAMPLERSTATE\_ADDRESSW

SAMPLERSTATE\_BORDERCOLOR

SAMPLERSTATE\_MAGFILTER

SAMPLERSTATE\_MINFILTER

SAMPLERSTATE\_MIPFILTER

SAMPLERSTATE\_MIPMAPLODBIAS

SAMPLERSTATE\_MAXMIPLEVEL

SAMPLERSTATE\_MAXANISOTROPY

SAMPLERSTATE\_SRGBTEXTURE

SAMPLERSTATE\_ELEMENTINDEX

SAMPLERSTATE\_DMAPOFFSET  
  
TEXF\_NONE

TEXF\_POINT

TEXF\_LINEAR

TEXF\_ANISOTROPIC

TEXF\_PYRAMIDALQUAD

TEXF\_GAUSSIANQUAD  
  
TEXA\_WRAP

TEXA\_MIRROR

TEXA\_CLAMP

TEXA\_BORDER

TEXA\_MIRRORONCE

## input

MOUSE\_LEFT\_BUTTON

MOUSE\_MIDDLE\_BUTTON

MOUSE\_RIGHT\_BUTTON

MOUSE\_WHEEL\_UP

MOUSE\_WHEEL\_DOWN  
  
CURSORMODE\_DEFAULT

CURSORMODE\_CENTERED

CURSORMODE\_WRAPPED  
  
KEY\_LBUTTON

KEY\_RBUTTON

KEY\_CANCEL

KEY\_MBUTTON

KEY\_XBUTTON1

KEY\_XBUTTON2

KEY\_BACK

KEY\_TAB

KEY\_CLEAR

KEY\_RETURN

KEY\_SHIFT

KEY\_CONTROL

KEY\_MENU

KEY\_PAUSE

KEY\_CAPITAL

KEY\_KANA

KEY\_HANGEUL

KEY\_HANGUL

KEY\_JUNJA

KEY\_FINAL

KEY\_HANJA

KEY\_KANJI

KEY\_ESCAPE

KEY\_CONVERT

KEY\_NONCONVERT

KEY\_ACCEPT

KEY\_MODECHANGE

KEY\_SPACE

KEY\_PRIOR

KEY\_NEXT

KEY\_END

KEY\_HOME

KEY\_LEFT

KEY\_UP

KEY\_RIGHT

KEY\_DOWN

KEY\_SELECT

KEY\_PRINT

KEY\_EXECUTE

KEY\_SNAPSHOT

KEY\_INSERT

KEY\_DELETE

KEY\_HELP

KEY\_LWIN

KEY\_RWIN

KEY\_APPS

KEY\_SLEEP

KEY\_NUMPAD0

KEY\_NUMPAD1

KEY\_NUMPAD2

KEY\_NUMPAD3

KEY\_NUMPAD4

KEY\_NUMPAD5

KEY\_NUMPAD6

KEY\_NUMPAD7

KEY\_NUMPAD8

KEY\_NUMPAD9

KEY\_MULTIPLY

KEY\_ADD

KEY\_SEPARATOR

KEY\_SUBTRACT

KEY\_DECIMAL

KEY\_DIVIDE

KEY\_F1

KEY\_F2

KEY\_F3

KEY\_F4

KEY\_F5

KEY\_F6

KEY\_F7

KEY\_F8

KEY\_F9

KEY\_F10

KEY\_F11

KEY\_F12

KEY\_F13

KEY\_F14

KEY\_F15

KEY\_F16

KEY\_F17

KEY\_F18

KEY\_F19

KEY\_F20

KEY\_F21

KEY\_F22

KEY\_F23

KEY\_F24

KEY\_NAVIGATION\_VIEW

KEY\_NAVIGATION\_MENU

KEY\_NAVIGATION\_UP

KEY\_NAVIGATION\_DOWN

KEY\_NAVIGATION\_LEFT

KEY\_NAVIGATION\_RIGHT

KEY\_NAVIGATION\_ACCEPT

KEY\_NAVIGATION\_CANCEL

KEY\_NUMLOCK

KEY\_SCROLL

KEY\_OEM\_NEC\_EQUAL

KEY\_OEM\_FJ\_JISHO

KEY\_OEM\_FJ\_MASSHOU

KEY\_OEM\_FJ\_TOUROKU

KEY\_OEM\_FJ\_LOYA

KEY\_OEM\_FJ\_ROYA

KEY\_LSHIFT

KEY\_RSHIFT

KEY\_LCONTROL

KEY\_RCONTROL

KEY\_LMENU

KEY\_RMENU

KEY\_BROWSER\_BACK

KEY\_BROWSER\_FORWARD

KEY\_BROWSER\_REFRESH

KEY\_BROWSER\_STOP

KEY\_BROWSER\_SEARCH

KEY\_BROWSER\_FAVORITES

KEY\_BROWSER\_HOME

KEY\_VOLUME\_MUTE

KEY\_VOLUME\_DOWN

KEY\_VOLUME\_UP

KEY\_MEDIA\_NEXT\_TRACK

KEY\_MEDIA\_PREV\_TRACK

KEY\_MEDIA\_STOP

KEY\_MEDIA\_PLAY\_PAUSE

KEY\_LAUNCH\_MAIL

KEY\_LAUNCH\_MEDIA\_SELECT

KEY\_LAUNCH\_APP1

KEY\_LAUNCH\_APP2

KEY\_OEM\_1

KEY\_OEM\_PLUS

KEY\_OEM\_COMMA

KEY\_OEM\_MINUS

KEY\_OEM\_PERIOD

KEY\_OEM\_2

KEY\_OEM\_3

KEY\_GAMEPAD\_A

KEY\_GAMEPAD\_B

KEY\_GAMEPAD\_X

KEY\_GAMEPAD\_Y

KEY\_GAMEPAD\_RIGHT\_SHOULDER

KEY\_GAMEPAD\_LEFT\_SHOULDER

KEY\_GAMEPAD\_LEFT\_TRIGGER

KEY\_GAMEPAD\_RIGHT\_TRIGGER

KEY\_GAMEPAD\_DPAD\_UP

KEY\_GAMEPAD\_DPAD\_DOWN

KEY\_GAMEPAD\_DPAD\_LEFT

KEY\_GAMEPAD\_DPAD\_RIGHT

KEY\_GAMEPAD\_MENU

KEY\_GAMEPAD\_VIEW

KEY\_GAMEPAD\_LEFT\_THUMBSTICK\_BUTTON

KEY\_GAMEPAD\_RIGHT\_THUMBSTICK\_BUTTON

KEY\_GAMEPAD\_LEFT\_THUMBSTICK\_UP

KEY\_GAMEPAD\_LEFT\_THUMBSTICK\_DOWN

KEY\_GAMEPAD\_LEFT\_THUMBSTICK\_RIGHT

KEY\_GAMEPAD\_LEFT\_THUMBSTICK\_LEFT

KEY\_GAMEPAD\_RIGHT\_THUMBSTICK\_UP

KEY\_GAMEPAD\_RIGHT\_THUMBSTICK\_DOWN

KEY\_GAMEPAD\_RIGHT\_THUMBSTICK\_RIGHT

KEY\_GAMEPAD\_RIGHT\_THUMBSTICK\_LEFT

KEY\_OEM\_4

KEY\_OEM\_5

KEY\_OEM\_6

KEY\_OEM\_7

KEY\_OEM\_8

KEY\_OEM\_AX

KEY\_OEM\_102

KEY\_ICO\_HELP

KEY\_ICO\_00

KEY\_PROCESSKEY

KEY\_ICO\_CLEAR

KEY\_PACKET

KEY\_OEM\_RESET

KEY\_OEM\_JUMP

KEY\_OEM\_PA1

KEY\_OEM\_PA2

KEY\_OEM\_PA3

KEY\_OEM\_WSCTRL

KEY\_OEM\_CUSEL

KEY\_OEM\_ATTN

KEY\_OEM\_FINISH

KEY\_OEM\_COPY

KEY\_OEM\_AUTO

KEY\_OEM\_ENLW

KEY\_OEM\_BACKTAB

KEY\_ATTN

KEY\_CRSEL

KEY\_EXSEL

KEY\_EREOF

KEY\_PLAY

KEY\_ZOOM

KEY\_NONAME

KEY\_PA1

KEY\_OEM\_CLEAR