Note: name is listed as author if contribution is at least 15 lines

HDL

- clockdomain_fifo.sv
    - Purpose: Wrapper to a Xilinx-built FIFO that can handle clock domain crossing
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code
- command_fifo.sv
    - Purpose: FIFO to keep track of in-flight commands
    - Authors: Roger, Alan
    - External Help: copied over from lab 6
- cw_hdmi_clk_wiz.v
    - Purpose: pre-built clocking wizard for getting the clock we need for HDMI output
    - Authors: None
    - External Help: copied over from lab 5, provided in starter code (Xilinx IP)
- ddd_projector.sv
    - Purpose: given 3 3D vertices of a triangle, projects vertices, computes normal, and converts into triangle format
    - Authors: Roger, Alan
    - External Help: None
- ddr3_controller.sv
    - Purpose: part of the UberDDR3 IP core that will serve as our memory chip controller
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code (Angelo Jacobo)
- ddr3_phy.sv
    - Purpose: part of the UberDDR3 IP core that will serve as our memory chip controller
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code (Angelo Jacobo)
- ddr3_top.sv
    - Purpose: part of the UberDDR3 IP core that will serve as our memory chip controller
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code (Angelo Jacobo)
- debouncer.sv
    - Purpose: debounces button inputs from FPGA
    - Authors: None
    - External Help: Joe wrote it in lecture 3
- depth_calculator.sv
    - Purpose: computes the depth of the intersection between a ray and a plane for depth ordering.
    - Authors: Roger
    - External Help: None

- divider3.sv
    - Purpose: pipelined divider for triangle projection
    - Authors: None
    - External Help: Joe wrote it, we made it for 16 bit, not 32 bit division
- evt_counter.sv
    - Purpose: counts new frame events so we can estimate FPS for evaluation
    - Authors: Roger, Alan
    - External Help: copied over from lab 2
- full_projector.sv
    - Purpose: collects obstacles and sprite data to convert into 3D triangles, then projects them into 2D triangles and outputs them serially
    - Authors: Roger
    - External Help: None
- game_logic.sv
    - Purpose: controls game logic in the project, such as player death
    - Authors: Alan
    - External Help: None
- high_definition_frame_buffer.sv
    - Purpose: The top-level connections for the full data pipeline feeding data in and out of the memory chip
    - Authors: Roger, Alan
    - External Help: copied over from lab 6, with some parts written by us
- lab06_clk_wiz.v
    - Purpose: an additional clocking wizard to generate the clock speeds the memory controller will need
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code (AMD IP)
- log2.sv
    - Purpose: a helper module to determine the position of the msb of a signed integer. Used to scale down dividends/divisors.
    - Authors: Roger
    - External Help: None
- obstacle_generator.sv
    - Purpose: stores upcoming and recently passed obstacles in registers, also generates obstacles pseudorandomly from the back. Outputs all obstacles by cycling through them each frame.
    - Authors: Roger, Alan
    - External Help: None
- pipeline.sv
    - Purpose: pipelining various inputs without having to write buffers each time
    - Authors: Roger
    - External Help: None
- pixel_calculator.sv
    - Purpose: single-cycle module to determine if triangle contains a pixel coordinate

    - Authors: Roger, Alan
    - External Help: None
- renderer.sv
    - Purpose: has all the parallelized datapaths of triangles and tile BRAMs which tile_painters interface with, painting the frame row by row. When it finishes a row, the pixel data is also outputted with h_count and v_count for the DRAM
    - Authors: Roger
    - External Help: None
- seven_segment_controller.sv
    - Purpose: controls all eight digits of the seven-segment displays
    - Authors: Roger, Alan
    - External Help: copied over from lab 2 code
- small_multiplier.sv
    - Purpose: performs a pipelined multiplication, as we were short a few DSPs.
    - Authors: Roger
    - External Help: None
- speed_params.sv
    - Purpose: small module to combinationally determine parameters for game logic, such as gravity and ducking duration
    - Authors: Alan
    - External Help: None
- sprite_creator.sv
    - Purpose: based on the sprite location and ducking status, outputs a bunch of 3D triangle coordinates to be projected later. Also provides lane line triangles
    - Authors: Roger, Alan
    - External Help: None
- stacker.sv
    - Purpose: serializes pixel data to be written/read as 128-bit messages
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code
- tile_painter.sv
    - Purpose: interfaces with triangle and tile BRAMs to iteratively paint a triangle onto the tile buffer. Also does depth calculation and uses a pixel_calculator to determine pixel coordinate-level depth comparisons
    - Authors: Roger
    - External Help: None
- tm_choice.sv
    - Purpose: encodes data to minimize transitions from high to low
    - Authors: Roger, Alan
    - External Help: copied over from lab 4
- tmds_encoder.sv
    - Purpose: encodes data to minimize imbalance of high and low signal
    - Authors: Roger, Alan
    - External Help: copied over from lab 4

- tmds_serializer.sv
    - Purpose: a module to serialize the TMDS signal
    - Authors: None
    - External Help: copied over from lab 4, provided in starter code
- top_level.sv
    - Purpose: top level file for entire project
    - Authors: Roger, Alan
    - External Help: a good amount of this was taken from lab 6 code, such as the seven segment display and HDMI wiring
- traffic_generator.sv
    - Purpose: generator of commands for the memory controller
    - Authors: Roger, Alan
    - External Help: copied over from lab 6, with some parts written by us
- triangle_creator.sv
    - Purpose: based on obstacle type and location, outputs a bunch of relevant 3D triangle coordinates to be projected later
    - Authors: Roger
    - External Help: None
- unstacker.sv
    - Purpose: deserializes pixel data from being written/read as 128-bit messages
    - Authors: None
    - External Help: copied over from lab 6, provided in starter code
- video_sig_gen.sv
    - Purpose: video signal generator for HDMI
    - Authors: Roger, Alan
    - External Help: copied over from lab 4
- xilinx_true_dual_port_read_first_2_clock_ram.v
    - Purpose: two-port BRAM module for our tile and triangles BRAMs
    - Authors: None
    - External Help: copied over from lab 5, provided in starter code

SIM

- hex_to_rgb16.py
    - Purpose: easy conversions between hex color and 5-6-5 colors for testbenches
    - Authors: Roger
    - External Help: None
- test_ddd_projector.py
    - Purpose: testbench for ddd_projector module
    - Authors: Alan
    - External Help: None
- test_depth_calculator.py
    - Purpose: testbench of depth_calculator module
    - Authors: Roger
    - External Help: None

- test_full_projector.py
    - Purpose: testbench for full_projector module
    - Authors: Roger
    - External Help: None
- test_image.py
    - Purpose: reads from a txt file to produce an image, helpful for checking that our initial tile painting was done properly
    - Authors: Roger
    - External Help: None
- test_log2.py
    - Purpose: tests helper module log2
    - Authors: Roger
    - External Help: None
- test_pixel_calculator.py
    - Purpose: testbench for pixel_calculator module
    - Authors: Roger, Alan
    - External Help: None
- test_projected_triangles.py
    - Purpose: uses py5 to display projected triangles from full_projector module for further verification
    - Authors: Roger
    - External Help: None
- test_renderer.py
    - Purpose: testbench for renderer module
    - Authors: Roger
    - External Help: None
- test_small_multiplier.py
    - Purpose: testbench for helper module small_multiplier
    - Authors: Roger
    - External Help: None
- test_tile_painter.py
    - Purpose: testbench for tile_painter module
    - Authors: Roger, Alan
    - External Help: None

OTHER

- tile_bram.mem
    - Purpose: all-white pixels/maximum depth to initialize into the tile BRAMs
    - Authors: Roger
    - External Help: None
- top_level.xdc
    - Purpose: XDC file for project
    - Authors: None

    - External Help: copied directly from the file that course staff provided for lab 6
- build.tcl
    - Purpose: build file for project
    - Authors: None
    - External Help: copied directly from the file that course staff provided for lab 6