`timescale 1ns / 1ps

module Project\_tb;

// Inputs

reg clk;

reg reset;

reg touchscreen\_input;

reg [3:0] button\_input;

reg barcode\_detection;

reg [7:0] barcode\_data;

reg [3:0] cash\_insertion;

reg [2:0] denomination\_selection;

reg cash\_confirmation;

reg [31:0] confirmed\_amount;

reg [31:0] inserted\_cash\_amount;

reg payment\_confirmation;

reg transaction\_complete;

reg [31:0] transaction\_amount;

// Outputs

wire touchscreen\_prompt;

wire [3:0] button\_selection;

wire voucher\_detected;

wire [7:0] captured\_data;

wire cash\_accepted;

wire [3:0] inserted\_cash\_amount\_output;

wire [31:0] adjusted\_amount;

wire excess\_payment;

wire short\_payment;

wire disconnection;

wire acknowledgment\_issued;

// Instantiate the DUT (Design Under Test)

Project dut (

.clk(clk),

.reset(reset),

.touchscreen\_input(touchscreen\_input),

.button\_input(button\_input),

.barcode\_detection(barcode\_detection),

.barcode\_data(barcode\_data),

.cash\_insertion(cash\_insertion),

.denomination\_selection(denomination\_selection),

.cash\_confirmation(cash\_confirmation),

.confirmed\_amount(confirmed\_amount),

.inserted\_cash\_amount(inserted\_cash\_amount),

.payment\_confirmation(payment\_confirmation),

.transaction\_complete(transaction\_complete),

.transaction\_amount(transaction\_amount),

.touchscreen\_prompt(touchscreen\_prompt),

.button\_selection(button\_selection),

.voucher\_detected(voucher\_detected),

.captured\_data(captured\_data),

.cash\_accepted(cash\_accepted),

.inserted\_cash\_amount\_output(inserted\_cash\_amount\_output),

.adjusted\_amount(adjusted\_amount),

.excess\_payment(excess\_payment),

.short\_payment(short\_payment),

.disconnection(disconnection),

.acknowledgment\_issued(acknowledgment\_issued)

);

// Clock generation

always begin

#5 clk = ~clk;

end

// Reset initialization

initial begin

reset = 1;

clk = 0;

#10 reset = 0;

end

// Test scenario

initial begin

// Apply inputs

touchscreen\_input = 1;

button\_input = 4'b0101;

barcode\_detection = 1;

barcode\_data = 8'b10101010;

cash\_insertion = 4'b1111;

denomination\_selection = 3'b101;

cash\_confirmation = 1;

confirmed\_amount = 32'd100;

inserted\_cash\_amount = 32'd80;

payment\_confirmation = 1;

transaction\_complete = 1;

transaction\_amount = 32'd1000;

// Wait for a few clock cycles

#20;

// Check outputs

if (touchscreen\_prompt !== 1'b1) $display("ERROR: Unexpected value for touchscreen\_prompt!");

if (button\_selection !== 4'b0101) $display("ERROR: Unexpected value for button\_selection!");

if (voucher\_detected !== 1'b1) $display("ERROR: Unexpected value for voucher\_detected!");

if (captured\_data !== 8'b10101010) $display("ERROR: Unexpected value for captured\_data!");

if (cash\_accepted !== 1'b1) $display("ERROR: Unexpected value for cash\_accepted!");

if (inserted\_cash\_amount\_output !== 4'b1111) $display("ERROR: Unexpected value for inserted\_cash\_amount\_output!");

if (adjusted\_amount !== 32'd20) $display("ERROR: Unexpected value for adjusted\_amount!");

if (excess\_payment !== 1'b0) $display("ERROR: Unexpected value for excess\_payment!");

if (short\_payment !== 1'b0) $display("ERROR: Unexpected value for short\_payment!");

if (disconnection !== 1'b0) $display("ERROR: Unexpected value for disconnection!");

if (acknowledgment\_issued !== 1'b1) $display("ERROR: Unexpected value for acknowledgment\_issued!");

// End simulation

$finish;

end

endmodule