Test bench

`define true 1'b1

`define false 1'b0

`define FIND 1'b0

`define AUTHENTICATE 1'b1

`define WAITING 3'b000

`define GET\_PIN 3'b001

`define MENU 3'b010

`define BALANCE 3'b011

`define WITHDRAW 3'b100

`define WITHDRAW\_SHOW\_BALANCE 3'b101

`define TRANSACTION 3'b110

`define DONE 3'b111

module atm\_tb();

reg clk, exit;

reg [11:0] accNumber;

reg [3:0] pin;

reg [11:0] destinationAccNumber;

reg [2:0] menuOption;

reg [10:0] amount;

wire error;

wire [10:0] balance;

ATM atmModule(clk, exit, accNumber, pin, destinationAccNumber, menuOption, amount, error, balance);

initial begin

clk = 1'b0;

end

always @(error) begin

if(error == `true)

$display("Error!, action causes an invalid operation.");

end

initial begin

//incorrect PIN

accNumber = 12'd2278;

pin = 4'b0100;

#30

//valid credentials

accNumber = 12'd2178;

pin = 4'b0100;

#30

//withdraw some money and then show the balance

amount = 100;

menuOption = `WITHDRAW\_SHOW\_BALANCE;

clk = ~clk;#5clk = ~clk;

#30

//show the balance

menuOption = `BALANCE;

clk = ~clk;#5clk = ~clk;

#30

//withdraw too much money, resulting in an error

amount = 2500;

menuOption = `WITHDRAW;

clk = ~clk;#5clk = ~clk;

#30

//the balance wont change because an error happened during withdrawal

menuOption = `BALANCE;

clk = ~clk;#5clk = ~clk;

#30

//transfer some money to the destination account with number 2816

amount = 50;

destinationAccNumber = 2816;

menuOption = `TRANSACTION;

clk = ~clk;#5clk = ~clk;

#30

//transfer too much money to the destination account with number 2816 which exceeds 2047 and cuases an error

amount = 2550;

destinationAccNumber = 2816;

menuOption = `TRANSACTION;

clk = ~clk;#5clk = ~clk;

#30

//exit the system

exit = 1;

#30

exit = 0;

#30

//log in using the account with number 2816

accNumber = 12'd2816;

pin = 4'b0110;

#30

//you'll see that the balance is more than the default value because we had trasnsferred some money to this account a while ago

menuOption = `BALANCE;

clk = ~clk;#5clk = ~clk;

#30;

end

endmodule