Test Case : When input a = 001 and a = 010

/multiply_by_squaring_tb/error_count	32'h0	0																
Table and based Order of		/ T																
Testbench Input/Output	_	(Testben	cn in	puvou	tput)	₩		\rightarrow		-	_		_			<u> </u>		
/multiply_by_squaring_tb/a_i_s	3	1 70	v .		V ~	 	V 4	70	V 4	2		V 4 1		V ~	V 4		V 4	V2
/multiply_by_squaring_tb/x_i_s	3			-4											X-1		<u> </u>	2
/multiply_by_squaring_tb/product_o_s	9	(1 (2	13	-4	-3	-2	-1	(0	<u> </u>	4	6	-8	-6	-4	-2	0	2	(4)
= A Entity		(Entity)																
Entity	4'd3	(Entity)	\rightarrow			₩		\rightarrow		2	-		\dashv			-		
/multiply_by_squaring_tb/duv/sg_ext_a		(1)(2	Хз	X-4) -3	-2	X-1	χo	_		3	(-4	-3	1-2	X-1	0	<u> </u>	12
/multiply_by_squaring_tb/duv/sg_ext_x	4'd3	(2) 3	14	X-3	1-2	-1	70	11			5		-3 -1	10	<u> </u>	2	\ <u>1</u>	14
/ /multiply_by_squaring_tb/duv/addra	4'd6	Z 3	₩.	<u> </u>	\- <u>-</u>				7=	4		\ <u>-</u>		\	<u> </u>		<u> </u>	
/ /multiply_by_squaring_tb/duv/addrb	4'd0	4 /0	V-Z	70	\ 4	3	14	<u> </u>	<u> </u>	1.0	-1	V 4	5	\ <u>4</u>	<u> </u>	2	Λ <u>Τ</u>	0
/multiply_by_squaring_tb/duv/douta	7'd36	4 (9	16	<u> </u>	<u> </u>	₩	χο_	<u> </u>	_	16		4	1	<u> </u>	\1	4	<u> </u>	16
/multiply_by_squaring_tb/duv/doutb	7'd0	0 1	4			9	4	\1	XO.	4.0	1		25	16		<u> </u>	<u> 1</u>	0
/multiply_by_squaring_tb/duv/douta_b	8'd36						-4		4								8	16
	8'd9	(1 (2	3	-4	-3	-2	∦-1	(0	<u> </u>	4	6	-8	-6	.4	-2	0	2	4
- A																		
■→ ROM		(ROM)				<u> </u>			7						٠			
/multiply_by_squaring_tb/duv/inst_square_blo	4'h6	2 3	4	\D_		ĬF.	χο_	X1					E	0	<u> </u>	2	<u> 3</u>	4
/multiply_by_squaring_tb/duv/inst_square_blo	7'h24	04 09	_				_		04	110						04	(09	10
/multiply_by_squaring_tb/duv/inst_square_blo	4'h0	(<u>0 (F</u>	ΪE			3	.2	X1	<u> </u>		<u> </u>		5	<u> 14</u>		2	<u> </u>	0
/multiply_by_squaring_tb/duv/inst_square_blo	7'h00	00 01													(09	04	<u> </u>	00
/multiply_by_squaring_tb/duv/inst_square_blo	{7'h00} {7'h01} {	{00} {01}	{04}	(09) {10	0} {19}	{24}	{31} {	40} {3	1} {24}	{19} {	10} {0	9} {04	} {01	L}				
∓♦ (0)	7'b0000000	0000000																
.	7'b0000001	0000001																
.	7'b0000100	0000100																
÷ 🔷 (3)	7'b0001001	0001001																
. ♦ (4)	7'b0010000	0010000																
	7'b0011001	0011001																
 → (6)	7'b0100100	0100100																
 	7'b0110001	0110001																
<u>.</u> → (8)	7'b1000000	1000000																
±♦ (9)	7'b0110001	0110001																
±♦ (10)	7'b0100100	0100100																
±·- / (11)	7'b0011001	0011001																
± (12)	7'b0010000	0010000																
(13)	7'b0001001	0001001																
	7'b0000100	0000100																
1	7'b0000001	0000001																
A) = A	2240 pg	111111	1.1	11111	1111	1.1	LITE	HIL	1111	111	111	1111		HILL	1111	111	1.1.1	1111

Test Case : When input a = 111 and a = 000

/multiply_by_squaring_tb/error_count	32'h0	0																
Testbench Input/Output		(Testbench Ir	nput/Out	put)			_		4			<u> </u>		_			 	
/multiply_by_squaring_tb/a_i_s	3	-2 -1		-			\downarrow		, <u> </u>	<u> </u>	V .		J	, 	<u> </u>		 	11
/multiply_by_squaring_tb/x_i_s	3	X-2 X-1 XC						-2			<u>, 1</u>	2	<u> </u>	1-4	[-3	1-2	1-1	<u> </u>
<u>+</u> → /multiply_by_squaring_tb/product_o_s	9	4 1 0) \(\lambda -1	1-2	χ-3	14	3	2	11	χο				-+				
■ ▲ Entity		(Entity)																
Entity	4'd3	(Entity)		\rightarrow			+-		\dashv	χο		-		\rightarrow			+	V 1
multiply_by_squaring_tb/duv/sg_ext_a	4'd3	\[-2 \\ -1 \\ \(\)) [1	Y 2	(3	Υ_4	2	-2			X 1	2	Y 2	Y - 4	7.2	-2	1_1	YO Y1
/multiply_by_squaring_tb/duv/sg_ext_x	4'd6	\-4\\-2\\-		\	12				-2		_) 3			1-2		XO X2
/multiply_by_squaring_tb/duv/addrb	4'd0	10 1-		1-3	\ <u>-</u> 4	13	2	_	X - 2	Λυ	-	1	л <u>э</u> Х-3	14	<u> </u>	12	+-1	10 12
/multiply_by_squaring_tb/duv/doute	7'd36	116 X4 X1	1 10	Y 1	.4		1-		14	Υn			19 19	16	19	\ <u>4</u>	1	XO X4
multiply_by_squaring_tb/duv/douta	7'd30 7'd0	10 11	4	19	16	_	4		Xo	۸0	=	1	19 19	116		14	1	10 14
/multiply_by_squaring_tb/duv/doutb // /multiply_by_squaring_tb/duv/douta_b	8'd36	116 X4 XC				16	_		4	Υn	\ 	4		ΛΙΦ	Λa	A **	1	Λ <u>υ</u> Υ.α
	8'd9	4 1 0												=				
	0 0 9	_ ^+ ^± ^└	, _{\-1}	^ <u>-4</u>	<u> </u>		1	_\	ᠰ╪┼	<u>, u</u>				\dashv			\top	^_
□→ ROM		(ROM)																
// /multiply_by_squaring_tb/duv/inst_square_blo	4'h6	XC XE XE	= 10	71	12	ĮВ	lc	ΪD	ΧE	χo	X 1	2	Х3	χc	χD	ΪE	ŢĒ.	X0 X2
multiply_by_squaring_tb/duv/inst_square_blo	7'h24	X10 X04 X0		01			1		-			1					_	X00 X0
/multiply_by_squaring_tb/duv/inst_square_blo	4'h0	0 F	- (F				2		Χo					14	13	2	1	(0
// /multiply_by_squaring_tb/duv/inst_square_blo	7'h00		01 (04						_		01	04				.04	01	00
// /multiply_by_squaring_tb/duv/inst_square_blo	{7'h00} {7'h01} {	{00} {01} {04}																,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	7'b0000000	0000000			,==,,	, ,	-	-, ,,			-, ,-	,,==,						
1 (1)	7'b0000001	0000001																
÷ 🔷 (2)	7'b0000100	0000100																
	7'b0001001	0001001																
± → (4)	7'b0010000	0010000																
± → (5)	7'b0011001	0011001																
± → (6)	7'b0100100	0100100																
± → (7)	7'b0110001	0110001																
± · (8)	7'b1000000	1000000																
+ (9)	7'b0110001	0110001																
	7'b0100100	0100100																
+ (11)	7'b0011001	0011001																
± → (12)	7'b0010000	0010000																
± → (13)	7'b0001001	0001001																
± ♦ (14)	7'b0000100	0000100																
+ → (15)	7'b0000001	0000001																

Test Case: when input a = 100 and 101

/multiply_by_squaring_tb/CLK_PERIOD	10 ns	10 ns																							
/multiply_by_squaring_tb/clk_100MHz	1		ψи		υψ	Ш	Ш	ПΤ			ĮП	ЛЛ	ЛТ	Ш	ΙЛ	ДЛ	ЛЛ	ЛД	TT	υп	ļП		υψ	ПП	υυψ
/multiply_by_squaring_tb/error_count	32'h0	0											=										\dashv		
Testbench Input/Output		(Testbe	nch Inp	ut/Out	put)																				
/multiply_by_squaring_tb/a_i_s	-3'd4	3						-4			 						7-3				\vdash				
→ /multiply_by_squaring_tb/x_i_s	-3'd3		-1 (_	-4								-4			-1	0	1-	2	3	-4	(-3 ·
<u>→</u> /multiply_by_squaring_tb/product_o_s	8'd12	\6	-3 () [3	3 (6	9)	16	12	<u> </u>	14	(0	7-4	χ-8	-12	116	Ϊ,9	7,6	3	0	-3	∜-6	7-9	12	<u> </u>
- A - ···																									
□ ◆ Entity		(Entity)									_					<u> </u>					_				
	-4'd4	3					=	-4			 						-3				 				
	-4'd3	X-2 X			- 1					-2				2			-3				1			-4	
+ // /multiply_by_squaring_tb/duv/addra	-4'd7	X1 X		3 4	1 1	5 (-8	•	_				-2								_			(-6)
+ / /multiply_by_squaring_tb/duv/addrb	-4'd1	<u> </u>	4 3	3 2		1 (<u> </u>							-6	_	0			-2	7-3	-4	(-5	-6		XO.
• / /multiply_by_squaring_tb/duv/douta	7'd49	X1 X	4 9) [1	.6 2	25	36	-64	49	36	25	16	(9	4	(1	-64	36	25	16	(9	4	(1	(0	49	36
/multiply_by_squaring_tb/duv/doutb	7'd1	25	16 (9) 4	1 (1 (0		1	4	9	16	25	36	49	0		(1	4	9	16	25	36	1	0
/multiply_by_squaring_tb/duv/douta_b	8'd48	-24	-12 () (1	.2 2	24	36	64	48	32	16	0	(-16	-32	-48	64	36	24	12	(0	-12	-24	(-36	48	36
	8'd12	X-6 X	-3 () (3	3 (6	9	16	12	8	4	(0	(-4	-8	-12	16	9	(6	3	0	-3	-6	-9	12	(9)
□·→ ROM		(ROM)																							
/multiply_by_squaring_tb/duv/inst_square_block/addra_i	4'h9	X1 X	2 3	} \ 4	1 (5 (6	8	9	Α		С	XD	XΕ	(F	8	Α	ХΒ	С	(D	ΪE	ζF	(0	9	(A)
🖟 👍 /multiply_by_squaring_tb/duv/inst_square_block/douta_o	7'h31	(01)	04 (9 1	LO (19 (24	40	31	24	19	10	09	04	01	40	24	(19	10		_		(00	31	24
/multiply_by_squaring_tb/duv/inst_square_block/addrb_i	4'hF	_(5(4 3	3 2	2	1 (0		F	Œ	D	C	ХВ	Α	9	0		XΕ	ĮΕ	D	С	ζВ	XΑ	1	(0
🛓🔩 /multiply_by_squaring_tb/duv/inst_square_block/doutb_o	7'h01	X19 X	10 (0	9 (0)4 (01 (00		01	04	09	10	(19	24	31	00		(01	04	09	10	(19	24	01	00
// /multiply by squaring tb/duv/inst square block/rom array	{7'h00} {7'h01} {	{00} {01	} {04} {0	9} {10	} {19}	{24} {3	31} {40	0} {31}	{24}	{19} {10) {09}	{04} {0	1}												

Console Output

```
🖂 папьспрі 🗉
```

```
# ** Warning: NUMERIC_STD.TO_INTEGER: metavalue detected, returning 0
# Time: 0 ns Iteration: 1 Instance: /multiply_by_squaring_tb/duv/inst_square_block
# ** Warning: NUMERIC_STD.TO_INTEGER: metavalue detected, returning 0
# Time: 0 ns Iteration: 1 Instance: /multiply_by_squaring_tb/duv/inst_square_block
# 
# *******
# RESULTS
# *******
# Simulation completed without errors
# 
# *********
# Simulation Ending
# ***********
# Simulation Ending
# ***********
# Break in Process stimuli_proc at ../tb/multiply_by_squaring_tb.vhd line 134

VSIM 2>
```

Coverage Result

```
vcover report -verbose -output final_report_verbose.txt merged_coverage.ucdb
End time: 22:49:44 on Nov 03,2022, Elapsed time: 0:00:00
Errors: 0, Warnings: 0
Reading pref.tcl
# 2020.4_2
# coverage read -dataset merged_coverage merged_coverage.ucdb
# merged_coverage.ucdb opened as coverage dataset "merged_coverage"
# coverage report -output final_report_by_srcfile.txt -srcfile=* -code {s b c e f x}
# exit
Coverage Report Summary Data by file
=== File: ../src/dp_rom.vhd
_____
   Enabled Coverage
                          Bins
                                        Misses Coverage
                                            0 100.00%
   Statements
   ______
=== File: ../src/multiply_by_squaring.vhd
_____
   Enabled Coverage
                          Bins
                                  Hits
                                        Misses Coverage
   Statements
                                            0 100,00%
Total Coverage By File (code coverage only, filtered view): 100.00%
```