ACADEVO
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(2) Booth Multiplier :

In this I have created 2 states state = 0 & 1
for state 0, I calculated both partial product and In state 1, I have added both partial product and stored in result.

$$\begin{array}{r} a_3\ a_2\ a_1\ a_0 \\ \times\ b_3\ b_2\ b_1\ b_0 \\ \hline \end{array}$$

Here $P_1 P_0 =$

0	$b_1 b_0 = 00$
A	$b_1 b_0 = 01$
2A	$b_1 b_0 = 10$
4A − A	$b_1 b_0 = 11$

and $P_3 P_2 =$

0	$b_3 b_2 = 00$
A	$b_3 b_2 = 01$
2A	$b_3 b_2 = 10$
4A − A	$b_3 b_2 = 11$

And then shifted the 2 bits of $P_3 P_2$ by 2 bits and added this partial product