

同學好，本次 LAB10 Optimal 32bit Serial Multiplier，同學若完全遵照流程圖做修改，將會得到以下之結果，為正常現象。

```
D:\iverilog\iverilog\bin>iverilog -o test tb32mpy_opt.v
D:\iverilog\iverilog\bin>vvp test
VCD info: dumpfile lab10.vcd opened for output.

// Successful //
//          30 *          90 = ?
//your answer is          2700, correct answer is          2700

// Fail //
//          30 *          -90 = ?
//your answer is          128849016180, but correct answer is          -2700

// Fail //
//          -30 *          90 = ?
//your answer is          8589931892, but correct answer is          -2700

// Fail //
//          -30 *          -90 = ?
//your answer is          1152921384347765388, but correct answer is          2700

// Fail //
//          4294967295 *          4294967295 = ?
//your answer is          1, but correct answer is          18446744065119617025

// Fail //
//          4294967296 *          1 = ?
//your answer is          0, but correct answer is          4294967296

// Fail //
//          4294967297 *          1 = ?
//your answer is          1, but correct answer is          4294967297
```

請同學思考一下計算錯誤的發生原因，或看波形圖，做個修正，以算出與原本 32bit Serial Multiplier 相同結果:

```
D:\iverilog\iverilog\bin>iverilog -o test tb32mpy_opt.v
D:\iverilog\iverilog\bin>vvp test
VCD info: dumpfile lab10.vcd opened for output.

// Successful //
//          30 *          90 = ?
//your answer is          2700, correct answer is          2700

// Fail //
//          30 *          -90 = ?
//your answer is          128849016180, but correct answer is          -2700

// Fail //
//          -30 *          90 = ?
//your answer is          386547053940, but correct answer is          -2700

// Fail //
//          -30 *          -90 = ?
//your answer is          18446743558313478796, but correct answer is          2700

// Successful //
//          4294967295 *          4294967295 = ?
//your answer is          18446744065119617025, correct answer is          18446744065119617025

// Fail //
//          4294967296 *          1 = ?
//your answer is          0, but correct answer is          4294967296

// Fail //
//          4294967297 *          1 = ?
//your answer is          1, but correct answer is          4294967297
```