Table 2.1

Predefined rules for bit-pair scanning in Booth's method.

X_i	X_{i-1}	rule
0	0	no action
0	1	add shifted multiplicand
1	0	subtract shifted multiplicand
1	1	no action

When a multiplicand is added or subtracted to/from an accumulator, it is first shifted left by i bit positions, just as it is done in partial products. This process can be examined in detail by following the examples in Boxes 2.16 and 2.17.

Box 2.16

Exercise for the reader

Consider 9 × 10 (unsigned):

```
    1001      multiplicand 9
    1010      multiplier 10
-------------
    0000      (i=0, no action since bit pair = 0 and a hidden zero)
   -1001      (i=1, subtract multiplicand since bit pair = 10)
  +1001       (i=2, add multiplicand ≪ 2 since bit pair = 01)
 -1001        (i=3, subtract multiplicand ≪ 3 since bit pair = 10)
+1001         (i=4, add multiplicand ≪ 2 since bit pair = 01)
-------------
              (i=5 and onwards, no action since all bit pairs = 00)
```

The result is therefore obtained as the summation of the following:

```
 10010000
 -1001000
  +100100
   -10010
```

Or by converting the subtractions into additions (see Section 2.4.4):

```
 10010000
+10111000
  +100100
+11101110
-------
=01011010
```

Result:

1011010 = 64 + 16 + 8 + 2 = 90 (correct)