Сумматор Склянского, Radix-8, 16-ти битный, быстрый

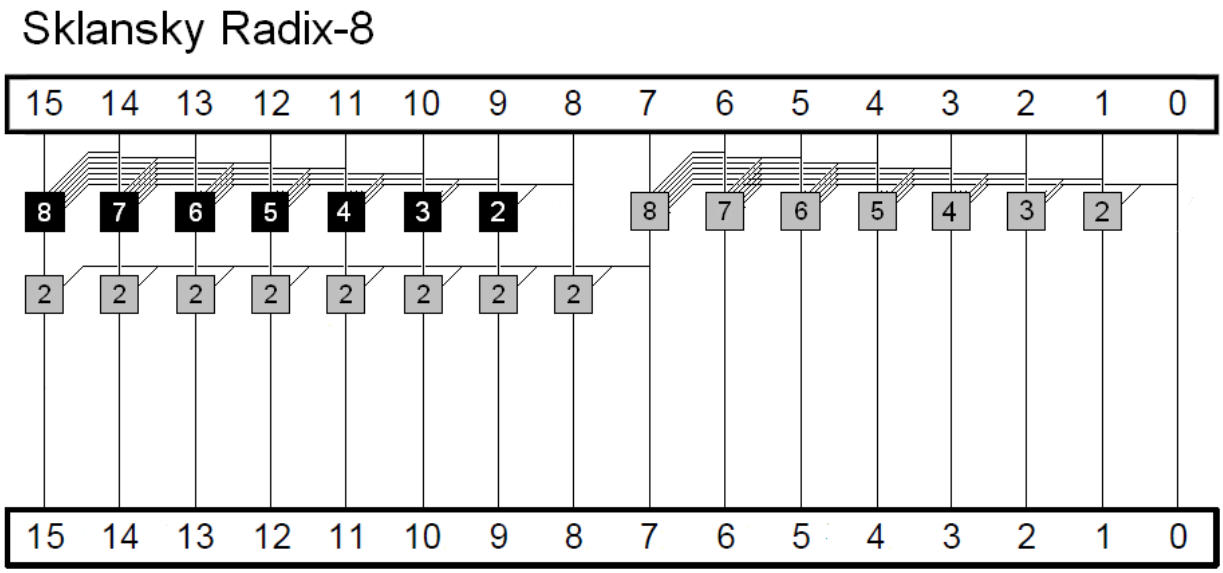

Рис.1. Граф генератора переносов сумматора Склянского, Radix-8, 16-ти разрядного.

Таблица валентностей операторов G:

```
Sklansky, Binary, Radix-8, 16-bit, 6dt
111111
5432109876543210  Bit Number
----------------
                  Step 0, Precalculation,  1dt
----------------
8765432 8765432   Step 1,                   3dt
22222222          Step 2,                   5dt
----------------
                  Sum,    Postcalculation, 6dt
----------------
```

Сумматор Склянского, Radix-8, 16-ти битный, быстрый (с параллельными операторами G) в виде логических уравнений:

```
'--- Step 0 ------------
 P00 =  A0 XOR  B0  '1dt
 G00 =  A0 AND  B0  '1dt

 P10 =  A1 XOR  B1  '1dt
 G10 =  A1 AND  B1  '1dt

 P20 =  A2 XOR  B2  '1dt
 G20 =  A2 AND  B2  '1dt

 P30 =  A3 XOR  B3  '1dt
 G30 =  A3 AND  B3  '1dt

 P40 =  A4 XOR  B4  '1dt
 G40 =  A4 AND  B4  '1dt

 P50 =  A5 XOR  B5  '1dt
 G50 =  A5 AND  B5  '1dt
```

```
 P60 =  A6 XOR  B6  '1dt
 G60 =  A6 AND  B6  '1dt

 P70 =  A7 XOR  B7  '1dt
 G70 =  A7 AND  B7  '1dt

 P80 =  A8 XOR  B8  '1dt
 G80 =  A8 AND  B8  '1dt

 P90 =  A9 XOR  B9  '1dt
 G90 =  A9 AND  B9  '1dt

P100 = A10 XOR B10  '1dt
G100 = A10 AND B10  '1dt

P110 = A11 XOR B11  '1dt
G110 = A11 AND B11  '1dt

P120 = A12 XOR B12  '1dt
G120 = A12 AND B12  '1dt

P130 = A13 XOR B13  '1dt
G130 = A13 AND B13  '1dt

P140 = A14 XOR B14  '1dt
G140 = A14 AND B14  '1dt

P150 = A15 XOR B15  '1dt
G150 = A15 AND B15  '1dt

'--- Step 1 ------------------------------------------------------------
G01 = G00                                                          '1dt
G11 = G10 OR_
      P10 AND G00                                                  '3dt
G21 = G20 OR_
      P20 AND G10 OR_
      P20 AND P10 AND G00                                          '3dt
G31 = G30 OR_
      P30 AND G20 OR_
      P30 AND P20 AND G10 OR_
      P30 AND P20 AND P10 AND G00                                  '3dt
G41 = G40 OR_
      P40 AND G30 OR_
      P40 AND P30 AND G20 OR_
      P40 AND P30 AND P20 AND G10 OR_
      P40 AND P30 AND P20 AND P10 AND G00                          '3dt
G51 = G50 OR_
      P50 AND G40 OR_
      P50 AND P40 AND G30 OR_
      P50 AND P40 AND P30 AND G20 OR_
      P50 AND P40 AND P30 AND P20 AND G10 OR_
      P50 AND P40 AND P30 AND P20 AND P10 AND G00                  '3dt
G61 = G60 OR_
      P60 AND G50 OR_
      P60 AND P50 AND G40 OR_
      P60 AND P50 AND P40 AND G30 OR_
      P60 AND P50 AND P40 AND P30 AND G20 OR_
      P60 AND P50 AND P40 AND P30 AND P20 AND G10 OR_
      P60 AND P50 AND P40 AND P30 AND P20 AND P10 AND G00          '3dt
G71 = G70 OR_
      P70 AND G60 OR_
      P70 AND P60 AND G50 OR_
      P70 AND P60 AND P50 AND G40 OR_
      P70 AND P60 AND P50 AND P40 AND G30 OR_
      P70 AND P60 AND P50 AND P40 AND P30 AND G20 OR_
```

```
      P70 AND P60 AND P50 AND P40 AND P30 AND P20 AND G10 OR_
      P70 AND P60 AND P50 AND P40 AND P30 AND P20 AND P10 AND G00  '3dt

P81 = P80                                                          '1dt
G81 = G80                                                          '1dt

P91 = P90 AND P80                                                  '2dt
G91 = G90 OR_
      P90 AND G80                                                  '3dt

P101 = P100 AND P90 AND P80                                        '2dt
G101 = G100 OR_
       P100 AND G90 OR_
       P100 AND P90 AND G80                                        '3dt

P111 = P110 AND P100 AND P90 AND P80
G111 = G110 OR_
       P110 AND G100 OR_
       P110 AND P100 AND G90 OR_
       P110 AND P100 AND P90 AND G80                               '3dt

P121 = P120 AND P110 AND P100 AND P90 AND P80
G121 = G120 OR_
       P120 AND G110 OR_
       P120 AND P110 AND G100 OR_
       P120 AND P110 AND P100 AND G90 OR_
       P120 AND P110 AND P100 AND P90 AND G80                      '3dt

P131 = P130 AND P120 AND P110 AND P100 AND P90 AND P80
G131 = G130 OR_
       P130 AND G120 OR_
       P130 AND P120 AND G110 OR_
       P130 AND P120 AND P110 AND G100 OR_
       P130 AND P120 AND P110 AND P100 AND G90 OR_
       P130 AND P120 AND P110 AND P100 AND P90 AND G80             '3dt

P141 = P140 AND P130 AND P120 AND P110 AND P100 AND P90 AND P80
G141 = G140 OR_
       P140 AND G130 OR_
       P140 AND P130 AND G120 OR_
       P140 AND P130 AND P120 AND G110 OR_
       P140 AND P130 AND P120 AND P110 AND G100 OR_
       P140 AND P130 AND P120 AND P110 AND P100 AND G90 OR_
       P140 AND P130 AND P120 AND P110 AND P100 AND P90 AND G80    '3dt

P151 = P150 AND P140 AND P130 AND P120 AND P110 AND P100 AND P90 AND P80
G151 = G150 OR_
       P150 AND G140 OR_
       P150 AND P140 AND G130 OR_
       P150 AND P140 AND P130 AND G120 OR_
       P150 AND P140 AND P130 AND P120 AND G110 OR_
       P150 AND P140 AND P130 AND P120 AND P110 AND G100 OR_
       P150 AND P140 AND P130 AND P120 AND P110 AND P100 AND G90 OR_
       P150 AND P140 AND P130 AND P120 AND P110 AND P100 AND P90 AND G80
'3dt

'--- Step 2 ----------------------
 G02 =  G01                    '1dt
 G12 =  G11                    '3dt
 G22 =  G21                    '3dt
 G32 =  G31                    '3dt
 G42 =  G41                    '3dt
 G52 =  G51                    '3dt
 G62 =  G61                    '3dt
 G72 =  G71                    '3dt
 G82 =  G81 OR ( P81 AND G71)  '5dt
```

```
 G92 =  G91 OR ( P91 AND G71)  '5dt
G102 = G101 OR (P101 AND G71)  '5dt
G112 = G111 OR (P111 AND G71)  '5dt
G122 = G121 OR (P121 AND G71)  '5dt
G132 = G131 OR (P131 AND G71)  '5dt
G142 = G141 OR (P141 AND G71)  '5dt
G152 = G151 OR (P151 AND G71)  '5dt

'--- Sum ----------------
 S0 =  P00            '1dt
 S1 =  P10 XOR  G02   '4dt
 S2 =  P20 XOR  G12   '4dt
 S3 =  P30 XOR  G22   '4dt
 S4 =  P40 XOR  G32   '4dt
 S5 =  P50 XOR  G42   '4dt
 S6 =  P60 XOR  G52   '4dt
 S7 =  P70 XOR  G62   '4dt
 S8 =  P80 XOR  G72   '6dt
 S9 =  P90 XOR  G82   '6dt
S10 = P100 XOR  G92   '6dt
S11 = P110 XOR G102   '6dt
S12 = P120 XOR G112   '6dt
S13 = P130 XOR G122   '6dt
S14 = P140 XOR G132   '6dt
S15 = P150 XOR G142   '6dt
S16 =          G152   '5dt, S16=C16=Cout
```

Программа проверки логических уравнений сумматора Склянского, Radix-8, 16-ти битного, быстрого (с параллельными операторами G), на TurboBasic'e: http://andserkul.narod.ru/R8SKL16F.bas

Литература:

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2. Logical Effort of Higher Valency Adders. David Harris

3. Design Space Exploration for Power-Efficient Mixed-Radix Ling Adders. Chung-Kuan Cheng. Computer Science and Engineering Depart. University of California, San Diego.

4. Сумматор Склянского, Radix-2, 4-х битный. Куликов А. С.

5. Сумматор Склянского, Radix-2, 8-ми битный. Куликов А. С.

6. Сумматор Склянского, Radix-2, 16-ти битный. Куликов А. С.

7. Сумматор Склянского, Radix-3, 4-х битный. Куликов А. С.

8. Сумматор Склянского, Radix-3, 8-ми битный. Куликов А. С.

9. Сумматор Склянского, Radix-3, 16-ти битный. Куликов А. С.

10. Сумматор Склянского, Radix-4, 4-х битный. Куликов А. С.

11. Сумматор Склянского, Radix-4, 8-ми битный. Куликов А. С.

12. Сумматор Склянского, Radix-4, 16-ти битный. Куликов А. С.

13. Сумматор Склянского, Radix-8, 8-ми битный. Куликов А. С.
14. Сумматор Склянского, Radix-8, 32-х битный, быстрый. Куликов А. С.
15. Сумматор Склянского, Radix-16, 16-ти битный. Куликов А. С.
16. Сумматор, троичный, Radix-2, 1-но тритный. Куликов А. С.
17. Сумматор, троичный, Radix-2, 2-х тритный. Куликов А. С.
18. Сумматор, четверичный, Radix-2, 1-но квадритный. Куликов А. С.
19. Сумматор, четверичный, Radix-2, 2-х квадритный. Куликов А. С.

Приложение 1.

TurboBasic 1.0

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