DELAY ANALYSIS - MANAN CHICHRA (2022102058)

ADDITION:

1) Varying a0 bit.

S0 output

```
  Measurements for Transient Analysis

trise            =  3.994512e-10 targ=  4.494512e-10 trig=  5.000000e-11
tfall            =  4.656700e-10 targ=  2.000616e-06 trig=  2.000150e-06
tpd              =  4.32561e-10
```

S1 output

```
  Measurements for Transient Analysis

trise            =  6.079763e-10 targ=  6.579763e-10 trig=  5.000000e-11
tfall            =  5.117657e-10 targ=  2.000662e-06 trig=  2.000150e-06
tpd              =  5.59871e-10
```

S2 output

```
  Measurements for Transient Analysis

trise            =  9.004126e-10 targ=  9.504126e-10 trig=  5.000000e-11
tfall            =  9.829699e-10 targ=  2.001133e-06 trig=  2.000150e-06
tpd              =  9.41691e-10
```

S3 output

```
  Measurements for Transient Analysis

trise            =  1.223296e-09 targ=  1.273296e-09 trig=  5.000000e-11
tfall            =  1.375787e-09 targ=  2.001526e-06 trig=  2.000150e-06
tpd              =  1.29954e-09
```

Cout output

```
  Measurements for Transient Analysis

trise            =  1.346549e-09 targ=  1.396549e-09 trig=  5.000000e-11
tfall            =  1.697744e-09 targ=  2.001848e-06 trig=  2.000150e-06
tpd              =  1.52215e-09
```

2) Varying a1 bit.

S0 output:

*NO delay in S0 due to a0

S1 output

```
  Measurements for Transient Analysis

trise            =  4.942568e-10 targ=  5.442568e-10 trig=  5.000000e-11
tfall            =  3.085985e-10 targ=  2.000459e-06 trig=  2.000150e-06
tpd              =  4.01428e-10
```

S2 output

```
  Measurements for Transient Analysis

trise            =  6.081877e-10 targ=  6.581877e-10 trig=  5.000000e-11
tfall            =  5.336648e-10 targ=  2.000684e-06 trig=  2.000150e-06
tpd              =  5.70926e-10
```

S3 output

```
  Measurements for Transient Analysis

trise            =  9.128355e-10 targ=  9.628355e-10 trig=  5.000000e-11
tfall            =  9.765432e-10 targ=  2.001127e-06 trig=  2.000150e-06
tpd              =  9.44689e-10
```

Cout output

```
  Measurements for Transient Analysis

trise            =  1.040390e-09 targ=  1.090390e-09 trig=  5.000000e-11
tfall            =  1.231713e-09 targ=  2.001382e-06 trig=  2.000150e-06
tpd              =  1.13605e-09
```

3) Varying a2

No delay for in S0 ,S1 due to a2

S2 output

```
  Measurements for Transient Analysis

trise            =  4.922183e-10 targ=  5.422183e-10 trig=  5.000000e-11
tfall            =  3.079368e-10 targ=  2.000458e-06 trig=  2.000150e-06
tpd              =  4.00078e-10
```

S3 output

```
  Measurements for Transient Analysis

trise            =  6.076562e-10 targ=  6.576562e-10 trig=  5.000000e-11
tfall            =  5.104266e-10 targ=  2.000660e-06 trig=  2.000150e-06
tpd              =  5.59041e-10
```

4) Varying a3

S3 output

```
  Measurements for Transient Analysis

trise            =  4.970760e-10 targ=  5.470760e-10 trig=  5.000000e-11
tfall            =  3.239596e-10 targ=  2.000474e-06 trig=  2.000150e-06
tpd              =  4.10518e-10
```

Comparator:

1) Varying a1

```
  Measurements for Transient Analysis

trise_a_gr       =  3.972337e-10 targ=  4.472337e-10 trig=  5.000000e-11
tfall_a_gr       =  4.117979e-10 targ=  2.000562e-06 trig=  2.000150e-06
tpd_a_gr         =  4.04516e-10
trise_b_gr       =  4.600446e-10 targ=  5.100446e-10 trig=  5.000000e-11
tfall_b_gr       =  6.085235e-10 targ=  2.000759e-06 trig=  2.000150e-06
tpd_b_gr         =  5.34284e-10
```

```
  Measurements for Transient Analysis

trise_eq           =  3.302694e-10 targ=  3.802694e-10 trig=  5.000000e-11
tfall_eq           =  4.169778e-10 targ=  2.000567e-06 trig=  2.000150e-06
tpd_eq             =  3.73624e-10
```

2) Varying a0

```
  Measurements for Transient Analysis

trise_a_gr         =  4.714858e-10 targ=  5.214858e-10 trig=  5.000000e-11
tfall_a_gr         =  4.865061e-10 targ=  2.000637e-06 trig=  2.000150e-06
tpd_a_gr           =  4.78996e-10
trise_eq           =  3.495632e-10 targ=  3.995632e-10 trig=  5.000000e-11
tfall_eq           =  4.005698e-10 targ=  2.000551e-06 trig=  2.000150e-06
tpd_eq             =  3.75067e-10
```

3) Varying a2

```
  Measurements for Transient Analysis

trise_a_gr         =  3.640008e-10 targ=  4.140008e-10 trig=  5.000000e-11
tfall_a_gr         =  5.079136e-10 targ=  2.000658e-06 trig=  2.000150e-06
tpd_a_gr           =  4.35957e-10
trise_b            =  4.225447e-10 targ=  4.725447e-10 trig=  5.000000e-11
tfall_b            =  6.869553e-10 targ=  2.000837e-06 trig=  2.000150e-06
tpd_b              =  5.54750e-10
```

```
  Measurements for Transient Analysis

trise_eq           =  3.390494e-10 targ=  3.890494e-10 trig=  5.000000e-11
tfall_eq           =  4.231046e-10 targ=  2.000573e-06 trig=  2.000150e-06
tpd_eq             =  3.81077e-10
```

4) Varying a3

```
  Measurements for Transient Analysis

trise_a_gr          =  3.368450e-10 targ=  3.868450e-10 trig=  5.000000e-11
tfall_a_gr          =  5.209562e-10 targ=  2.000671e-06 trig=  2.000150e-06
tpd_a_gr            =  4.28901e-10
trise_b             =  3.941898e-10 targ=  4.441898e-10 trig=  5.000000e-11
tfall_b             =  7.252406e-10 targ=  2.000875e-06 trig=  2.000150e-06
tpd_b               =  5.59715e-10
```

```
  Measurements for Transient Analysis

trise_eq            =  3.439371e-10 targ=  3.939371e-10 trig=  5.000000e-11
tfall_eq            =  4.238385e-10 targ=  2.000574e-06 trig=  2.000150e-06
tpd_eq              =  3.83888e-10
```

5) Varying b0

```
  Measurements for Transient Analysis

trise_eq            =  3.620408e-10 targ=  4.120408e-10 trig=  5.000000e-11
tfall_eq            =  4.401111e-10 targ=  2.000590e-06 trig=  2.000150e-06
tpd_eq              =  4.01076e-10
trise_b             =  6.593267e-10 targ=  7.093267e-10 trig=  5.000000e-11
tfall_b             =  5.134242e-10 targ=  2.000663e-06 trig=  2.000150e-06
tpd_b               =  5.86375e-10
```

6) Varying b1

```
  Measurements for Transient Analysis

trise_a             =  6.924901e-10 targ=  7.424901e-10 trig=  5.000000e-11
tfall_a             =  6.255316e-10 targ=  2.000776e-06 trig=  2.000150e-06
tpd_a               =  6.59011e-10
trise_b             =  9.131734e-10 targ=  9.631734e-10 trig=  5.000000e-11
tfall_b             =  6.818881e-10 targ=  2.000832e-06 trig=  2.000150e-06
tpd_b               =  7.97531e-10
```

7) Varying b2

```
  Measurements for Transient Analysis

trise_a            =  6.285936e-10 targ=  6.785936e-10 trig=  5.000000e-11
tfall_a            =  5.804468e-10 targ=  2.000730e-06 trig=  2.000150e-06
tpd_a              =  6.04520e-10
trise_b            =  8.246288e-10 targ=  8.746288e-10 trig=  5.000000e-11
tfall_b            =  6.421411e-10 targ=  2.000792e-06 trig=  2.000150e-06
tpd_b              =  7.33385e-10
```

8) Varying b3

```
  Measurements for Transient Analysis

trise_a            =  7.229901e-10 targ=  7.729901e-10 trig=  5.000000e-11
tfall_a            =  5.913269e-10 targ=  2.000741e-06 trig=  2.000150e-06
tpd_a              =  6.57158e-10
trise_b            =  9.547241e-10 targ=  1.004724e-09 trig=  5.000000e-11
tfall_b            =  6.554347e-10 targ=  2.000805e-06 trig=  2.000150e-06
tpd_b              =  8.05079e-10
```

AND BLOCK

Varying A3A2A1A0

```
  Measurements for Transient Analysis

trise_ab0          =  1.827617e-10 targ=  2.327617e-10 trig=  5.000000e-11
tfall_ab0          =  1.629854e-10 targ=  2.000313e-06 trig=  2.000150e-06
tpd_ab             =  1.72874e-10
trise_ab1          =  1.827617e-10 targ=  2.327617e-10 trig=  5.000000e-11
tfall_ab1          =  1.629854e-10 targ=  2.000313e-06 trig=  2.000150e-06
tpd_ab             =  1.72874e-10
trise_ab2          =  1.827617e-10 targ=  2.327617e-10 trig=  5.000000e-11
tfall_ab2          =  1.595481e-10 targ=  2.000310e-06 trig=  2.000150e-06
tpd_ab             =  1.71155e-10
trise_ab3          =  1.748271e-10 targ=  2.248271e-10 trig=  5.000000e-11
tfall_ab3          =  1.543457e-10 targ=  2.000304e-06 trig=  2.000150e-06
tpd_ab             =  1.64586e-10
```

Varying B3B2B1B0

```
  Measurements for Transient Analysis

trise_ab0          =  1.713852e-10 targ=  2.213852e-10 trig=  5.000000e-11
tfall_ab0          =  1.429669e-10 targ=  2.000293e-06 trig=  2.000150e-06
tpd_ab             =  1.57176e-10
trise_ab1          =  1.834547e-10 targ=  2.334547e-10 trig=  5.000000e-11
tfall_ab1          =  1.671882e-10 targ=  2.000317e-06 trig=  2.000150e-06
tpd_ab             =  1.75321e-10
trise_ab2          =  1.787422e-10 targ=  2.287422e-10 trig=  5.000000e-11
tfall_ab2          =  1.614799e-10 targ=  2.000311e-06 trig=  2.000150e-06
tpd_ab             =  1.70111e-10
trise_ab3          =  1.787422e-10 targ=  2.287422e-10 trig=  5.000000e-11
tfall_ab3          =  1.614799e-10 targ=  2.000311e-06 trig=  2.000150e-06
tpd_ab             =  1.70111e-10
```

Subtraction:

1) Varying b3

S3 output

```
  Measurements for Transient Analysis

trise            = 5.675527e-10 targ= 6.175527e-10 trig= 5.000000e-11
tfall            = 5.597760e-10 targ= 2.000710e-06 trig= 2.000150e-06
tpd              = 5.63664e-10
```

Cout output

```
  Measurements for Transient Analysis

trise            = 6.451731e-10 targ= 6.951731e-10 trig= 5.000000e-11
tfall            = 5.045430e-10 targ= 2.000655e-06 trig= 2.000150e-06
tpd              = 5.74858e-10
```

2) Varying b2

Cout output

```
  Measurements for Transient Analysis

trise            = 1.105977e-09 targ= 1.155977e-09 trig= 5.000000e-11
tfall            = 7.757793e-10 targ= 2.000926e-06 trig= 2.000150e-06
tpd              = 9.40878e-10
```

S3 output

```
  Measurements for Transient Analysis

trise            = 7.678388e-10 targ= 8.178388e-10 trig= 5.000000e-11
tfall            = 6.754301e-10 targ= 2.000825e-06 trig= 2.000150e-06
tpd              = 7.21634e-10
```

S2 output

```
  Measurements for Transient Analysis

trise            = 5.253423e-10 targ= 5.753423e-10 trig= 5.000000e-11
tfall            = 5.549080e-10 targ= 2.000705e-06 trig= 2.000150e-06
tpd              = 5.40125e-10
```

3) Varying b1

S1 output

```
  Measurements for Transient Analysis

trise            =  5.722219e-10 targ=  6.222219e-10 trig=  5.000000e-11
tfall            =  5.489994e-10 targ=  2.000699e-06 trig=  2.000150e-06
tpd              =  5.60611e-10
```

S2 output

```
  Measurements for Transient Analysis

trise            =  7.850660e-10 targ=  8.350660e-10 trig=  5.000000e-11
tfall            =  6.707892e-10 targ=  2.000821e-06 trig=  2.000150e-06
tpd              =  7.27928e-10
```

S3 output

```
  Measurements for Transient Analysis

trise            =  1.306597e-09 targ=  1.356597e-09 trig=  5.000000e-11
tfall            =  1.003196e-09 targ=  2.001153e-06 trig=  2.000150e-06
tpd              =  1.15490e-09
```

Cout output

```
  Measurements for Transient Analysis

trise            =  1.627887e-09 targ=  1.677887e-09 trig=  5.000000e-11
tfall            =  1.097404e-09 targ=  2.001247e-06 trig=  2.000150e-06
tpd              =  1.36265e-09
```