.LIB (Liberty File) Format

```
lu_table_template(table10){
  variable_1 : total_output_net_capacitance;
  variable_2 : input_transition_time;
  index_1 ("0.0014,0.0030,0.0062,0.0125,0.0251,0.0504,0.1010");
  index_2 ("0.0208,0.0336,0.0600,0.1112,0.2136,0.4192,0.8304");
}
cell (INVX1) {
  pin(I) {
    direction: input;
    capacitance: 0.0109;
  }
  pin(ZN) {
    direction: output;
    capacitance: 0.0;
    internal_power() {
      rise_power(table10) {  // internal power when output rising
      value("0.0066,0.0090,0.0091,0.0094,0.0112,0.0147,0.0221",\
      "0.0023,0.0012,0.0084,0.0098,0.0107,0.0146,0.0224",\
      "0.0059,0.0089,0.0055,0.0094,0.0112,0.0138,0.0215",\
      "0.0098,0.0133,0.0067,0.0074,0.0118,0.0139,0.0199",\
      "0.0093,0.0038,0.0016,0.0059,0.0100,0.0131,0.0187",\
      "0.0076,0.0065,0.0062,0.0059,0.0015,0.0130,0.0168",\
      "0.0075,0.0059,0.0048,0.0019,0.0000,0.0000,0.0192");
      }
      fall_power(table10)   // internal power when output falling
      value(…);  // values are omitted in this example
    }  // end internal_power
```

input capacitance

```
    timing() {
      cell_rise(table10) {  // cell delay when output rising
      value("0.0134,0.0160,0.0199,0.0225,0.0317,0.0402,0.0504",\
      "0.0153,0.0184,0.0230,0.0261,0.0371,0.0474,0.0599",\
      "0.0189,0.0224,0.0281,0.0326,0.0458,0.0599,0.0766",\
      "0.0260,0.0293,0.0330,0.0426,0.0545,0.0800,0.1039",\
      "0.0400,0.0405,0.0458,0.0581,0.0764,0.0993,0.1468",\
      "0.0663,0.0686,0.0733,0.0837,0.1082,0.1440,0.1890",\
      "0.1222,0.1244,0.1292,0.1386,0.1595,0.2086,0.2792");
      }
      cell_fall(table10)   // cell delay when output is falling
      value(…);  // values are omitted in this example
      rise_transition(table10)  // output rising time
      value(…);  // values are omitted in this example
      fall_transition(table10)  // output falling time
      value(…);  // values are omitted in this example
    }  // end timing
  }  // end pin
}  // end cell
```

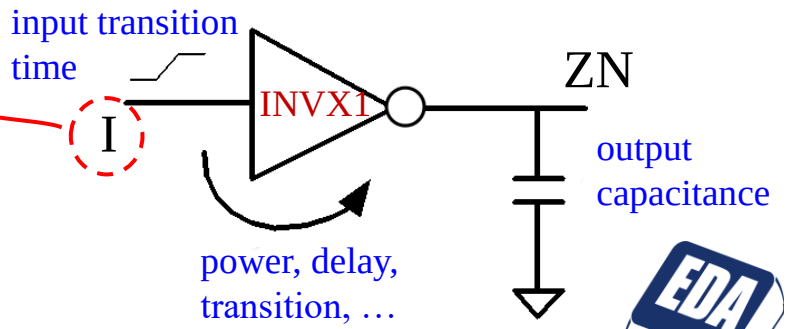


Table Template

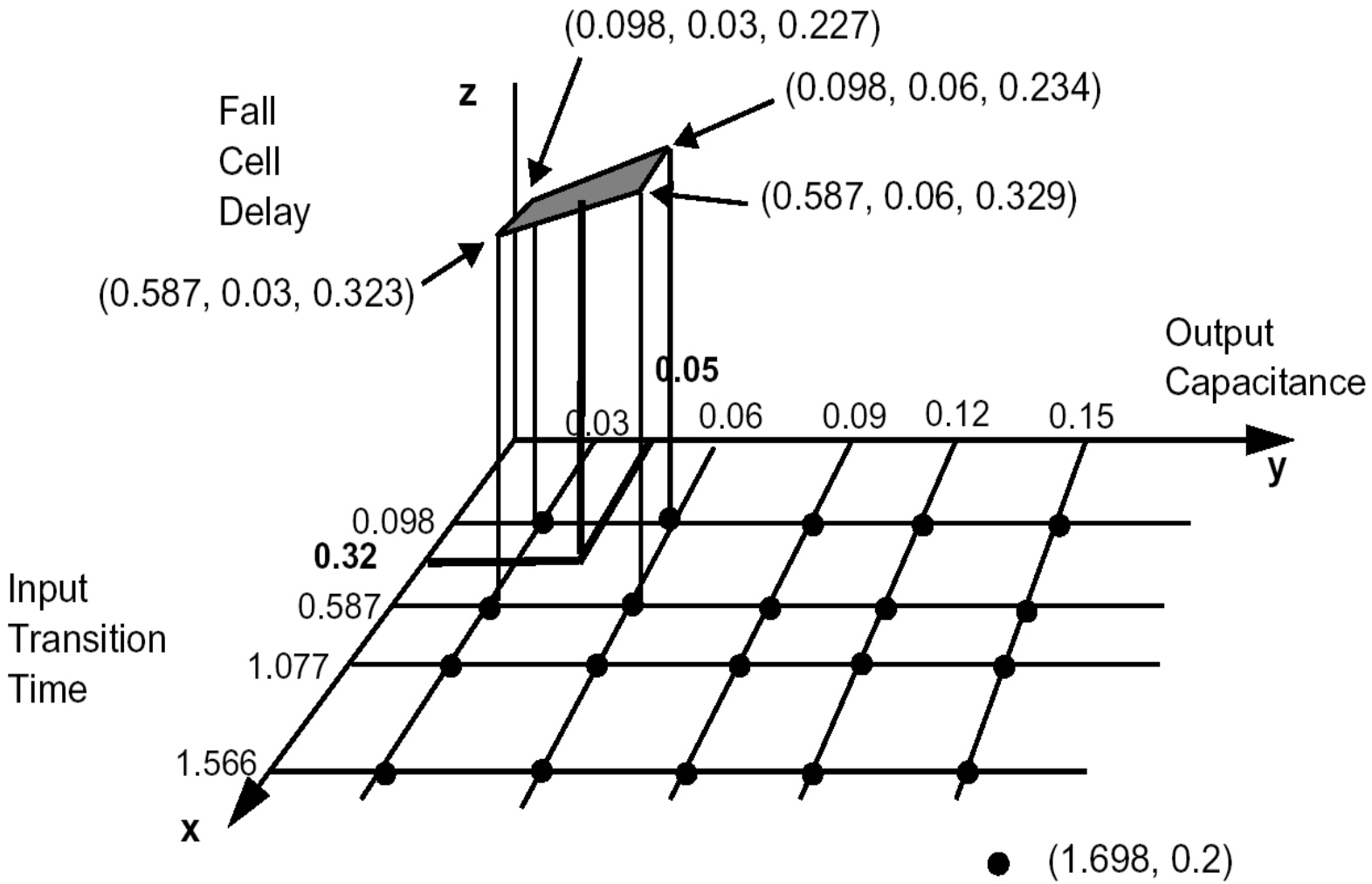
lu_table_template(**table10**){ ⟶ template name, used in following tables
  variable_1 : total_output_net_capacitance;
  variable_2 : input_transition_time;
  index_1 ("0.0014,0.0030,0.0062,0.0125,0.0251,0.0504,0.1010");
  index_2 ("0.0208,0.0336,0.0600,0.1112,0.2136,0.4192,0.8304");
}

Total Output Capacitance (pF)

Input Transition (ns)	0.0014	0.0030	0.0062	0.0125	0.0251	0.0504	0.1010
0.0208							
0.0336							
0.0600							
0.1112							
0.2136							
0.4192							
0.8304							

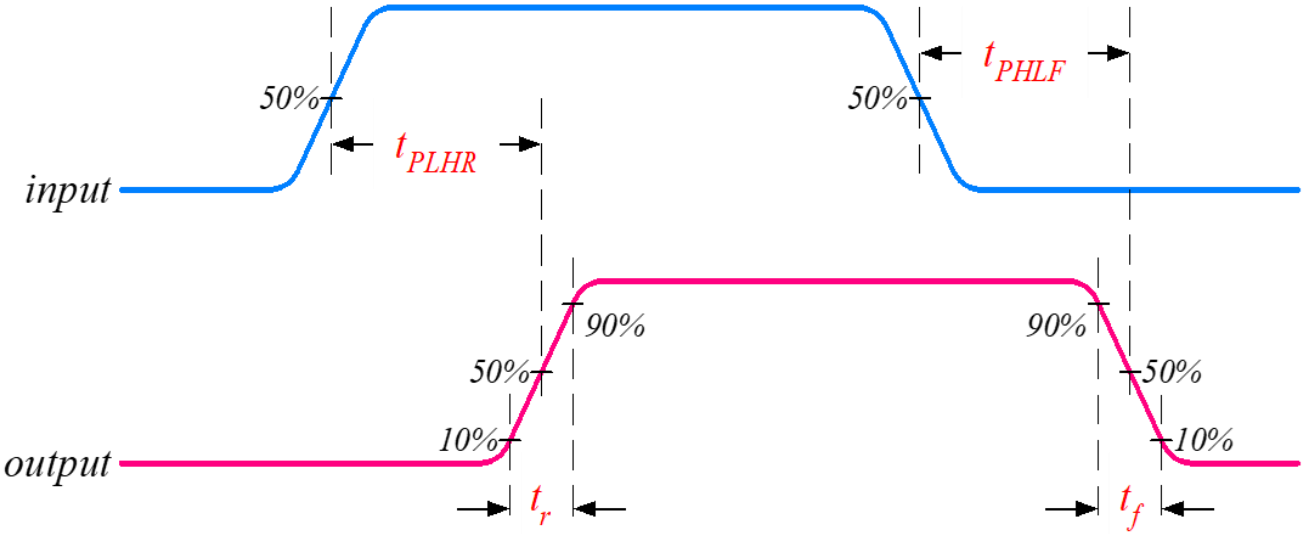
* You have to use interpolation (or extrapolation) to calculate the desired value.

Illustration of Delay Calculation



Definition of Timing Parameters

- Propagation delay (T_{pLH}, T_{pHL}), rising time (T_r), falling time (T_f)



- Definitions in LIB format:
  - Propagation Delay: **cell rise** = T_{PLH}, **cell fall** = T_{PHL}
  - Transition Time: **rise transition** = T_r, **fall transition** = T_f
    - (10% -- 90%) or (20% -- 80%)
  - Input Transition Time = output transition time of preceding cells
  - Output Loading = sum of input capacitance of succeeding cells