

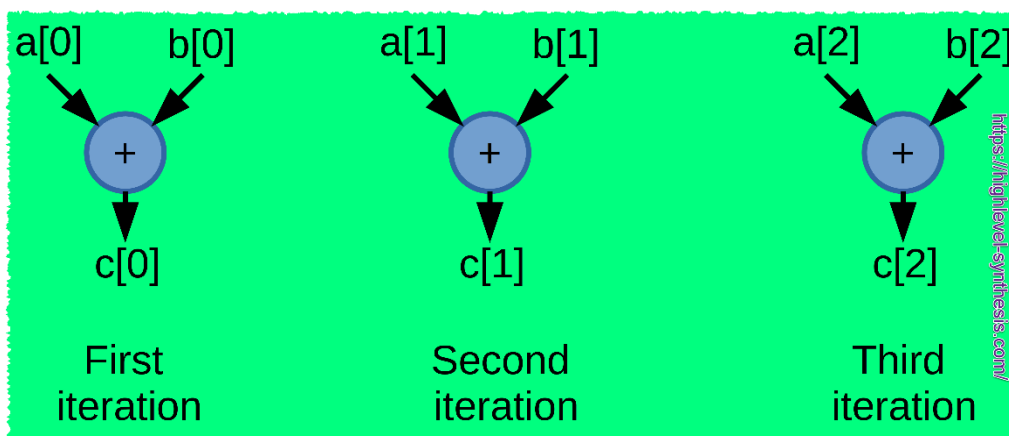
1-

```

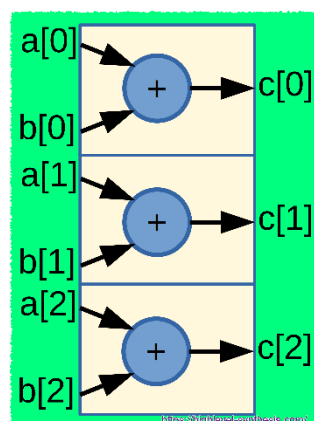
1  for (int i = 0; i < 3; i++) {
2      c[i] = a[i] + b[i];
3  }

```

The data dependency plays a crucial role in the combinational circuit execution model. For this purpose, a graph can show the dependency relation between expressions. According to the *for*-loop body, the loop has three iterations that are independent if arrays *a*, *b*, and *c* are stored in different memory areas. Each iteration can be shown by a single graph node as follows.



As these iterations are independent, all of them can be executed in parallel that can be shown as the following diagram.



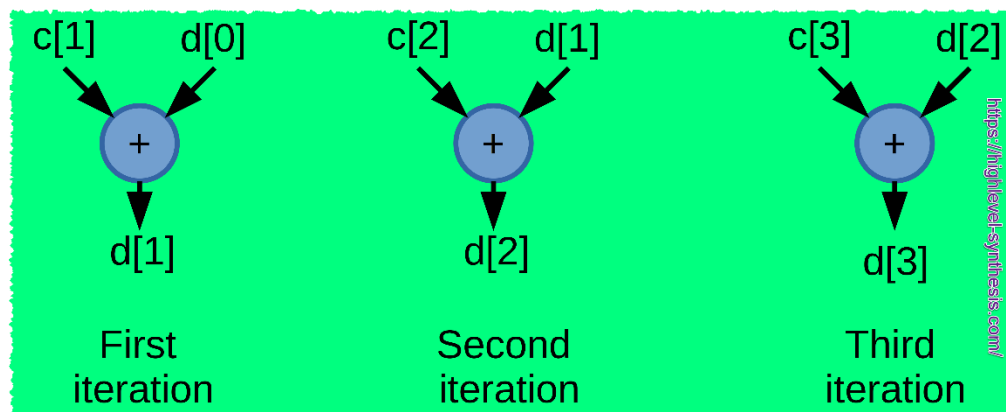
2-

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1  for (int i = 1; i < 4; i++) {
2      d[i] = c[i] + d[i-1];
3  }

```

As can be seen, each iteration of this for loop uses a data (denoted by $d[i - 1]$) generated by its predecessor. Therefore, there is a data dependency between two consecutive loop iterations in this code. Each addition in iteration can be shown by a graph node as follow.



These graph nodes should be executed one after another because of the data dependency between them. The following dataflow graph shows the hardware execution model of the for-loop.

