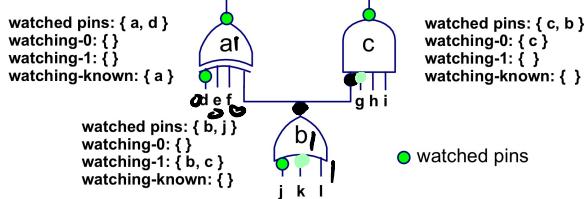


2. In this problem, we will use the provided “updateWatch()” routine to update the watched pins and watching gate lists for gates ‘a’, ‘b’, and ‘c’. The candidates of the watched pins include the gate itself and all of its fanins. We use a list “_wCandidates” to store these watch candidates, where the index 0 is the gate itself and index i (i > 0) is the i-th fanin of the gate. The initial watch indices for



these three gates are 0 and 1, that is, the gate itself and the first (leftist) fanin, respectively.

In the following sub-problems, for gates ‘a’, ‘b’, and ‘c’, please derive their updated watched pins and watching lists with respect to the specified implications. In addition, if any implication is generated by “updateWatch()”, please also specify.

- (a) $f \leftarrow 0$ (b) $b \leftarrow 1$ (c) $e \leftarrow 0$ (d) $a \leftarrow 1$
 (e) $1 \leftarrow 1$ (f) $j \leftarrow 0$ (g) $g \leftarrow 0$ (h) $h \leftarrow 1$

Please note that whenever a new implication is generated (direct or indirect), we will perform direct implications based on this gate’s direct implication graph first, and at the same time, schedule new “updateWatch()” if necessary.

(b)
 $b \leftarrow 1 \Rightarrow b$ change watched: $b \rightarrow k$, clean watched 1

a : watched pins: {a,d}

watched 0 : {}

watched 1 : {}

watched known {a}

b : watched pins {k,j}

watched 0 : {}

watched 1 : {}

watched known {}

c : watched pins {g,g}

watched 0 : {c}

watched 1 : {}

watched known {}

(a) a : watched pins: {a,d}

\Leftarrow watched 0 : {}

watched 1 : {}

watched known {a}

b: watched pins {b,j}

watched 0 : {}

watched 1 : {bc}

watched known {}

c: watched pins {g,b}

watched 0 : {c}

watched 1 : {}

watched known {}

(c) a : watched pins: {a,d}

\Leftarrow watched 0 : {}

watched 1 : {}

watched known {a}

b: watched pins {k,j}

watched 0 : {}

watched 1 : {}

watched known {}

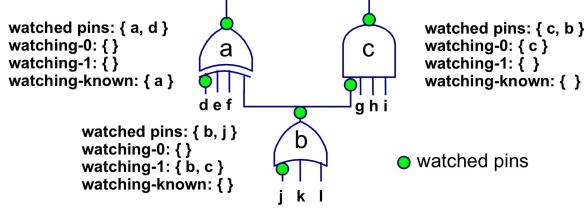
c: watched pins {g,g}

watched 0 : {c}

watched 1 : {}

watched known {}

2. In this problem, we will use the provided "updateWatch()" routine to update the watched pins and watching gate lists for gates 'a', 'b', and 'c'. The candidates of the watched pins include the gate itself and all of its fanins. We use a list "_wCandidates" to store these watch candidates, where the index 0 is the gate itself and index i (i > 0) is the i-th fanin of the gate. The initial watch indices for



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 (e) $1 \leftarrow 1$ (f) $j \leftarrow 0$ (g) $g \leftarrow 0$ (h) $h \leftarrow 1$

Please note that whenever a new implication is generated (direct or indirect), we will perform direct implications based on this gate's direct implication graph first, and at the same time, schedule new "updateWatch()" if necessary.

(e)
 $\ell=1$

a : watched pins: {a,d}
 watched 0 : {}
 watched 1 : {}
 watched known {}

b : watched pins {k,j}
 watched 0 {}
 watched 1 {}
 watched known {}

c : watched pins {g,g}
 watched 0 {}
 watched 1 {}
 watched known {}

(d)

$a \leftarrow \Rightarrow$ imply $d=0$, watched not changed

a : watched pins: {a,d}

watched 0 : {}

watched 1 : {}

watched known {a}

b : watched pins {k,j}

watched 0 {}

watched 1 {}

watched known {}

c : watched pins {g,g}

watched 0 {}

watched 1 {}

watched known {}

(f)
 $j \leftarrow 0 \Rightarrow$ call genIndexImp(k)

a : watched pins: {a,d}

watched 0 : {}

watched 1 : {}

watched known {}

b : watched pins {k,j}

watched 0 : {}

watched 1 : {}

watched known {}

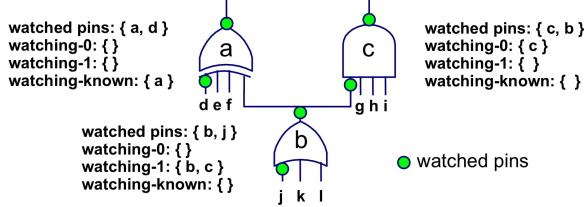
c : watched pins {g,g}

watched 0 {}

watched 1 {}

watched known {}

2. In this problem, we will use the provided "updateWatch()" routine to update the watched pins and watching gate lists for gates 'a', 'b', and 'c'. The candidates of the watched pins include the gate itself and all of its fanins. We use a list "_wCandidates" to store these watch candidates, where the index 0 is the gate itself and index i (i > 0) is the i-th fanin of the gate. The initial watch indices for



these three gates are 0 and 1, that is, the gate itself and the first (leftist) fanin, respectively.

In the following sub-problems, for gates 'a', 'b', and 'c', please derive their updated watched pins and watching lists with respect to the specified implications. In addition, if any implication is generated by "updateWatch()", please also specify.

- | | | | |
|----------------------|----------------------|----------------------|----------------------|
| (a) $f \leftarrow 0$ | (b) $b \leftarrow 1$ | (c) $e \leftarrow 0$ | (d) $a \leftarrow 1$ |
| (e) $1 \leftarrow 1$ | (f) $j \leftarrow 0$ | (g) $g \leftarrow 0$ | (h) $h \leftarrow 1$ |

Please note that whenever a new implication is generated (direct or indirect), we will perform direct implications based on this gate's direct implication graph first, and at the same time, schedule new "updateWatch()" if necessary.

(h)
 $h=1 \Rightarrow \text{call getIndexImpl}(i)$

a : watched pins : {a,d}

watched 0 : {}

watched 1 : {}

watched known {}

b : watched pins {k,j}

watched 0 {}

watched 1 {}

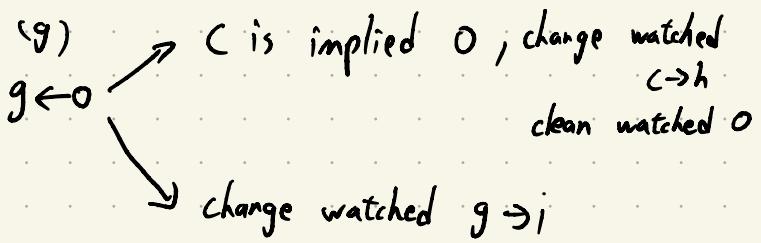
watched known {}

c : watched pins {h,i}

watched 0 {}

watched 1 {}

watched known {}



c. updateWatch(g,h)

a : watched pins : {a,d}

watched 0 : {}

watched 1 : {}

watched known {}

b : watched pins {k,j}

watched 0 {}

watched 1 {}

watched known {}

c : watched pins {h,i}

watched 0 {}

watched 1 {}

watched known {}