1. Fill out the table below assuming that initially the last branch was “taken.” Also assume that the value of \(d\) before the code fragment is reached is given in the following sequence: 1, 2, 1, 2. For your reference, the table in Slide 8, Lecture 4 (with initial state of Not Taken for the last branch and sequence of 2, 0, 2, 0 for the value of \(d\)) is given below.

\[
\begin{align*}
\text{if } (d == 0) & : \text{ BNEZ R1, L1 ; branch b1 } \\
& \text{ DADDUI R1, R0, #1 } \\
\text{if } (d == 1) & : \text{ L1: DADDUI R3, R1, #-1 } \\
& \text{ BNEZ R3, L2 ; branch b2 }
\end{align*}
\]

\[\ldots\]

\[\text{L2:}\]

1-bit predictor that uses 1 bit of correlation
- \(X/Y\): \(X\) if last branch was NT, \(Y\) if last branch was T

<table>
<thead>
<tr>
<th>(d)</th>
<th>2</th>
<th>0</th>
<th>2</th>
<th>0</th>
<th>(\text{b}_1)</th>
<th>(\text{b}_2)</th>
<th>(\text{b}_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>NT/NT</td>
<td>T</td>
<td>T/NT</td>
<td>NT/NT</td>
<td>T</td>
<td>NT/T</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>T/NT</td>
<td>NT</td>
<td>T/NT</td>
<td>NT/NT</td>
<td>NT</td>
<td>NT/T</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>T/NT</td>
<td>T</td>
<td>T/NT</td>
<td>NT/NT</td>
<td>T</td>
<td>NT/T</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>T/NT</td>
<td>NT</td>
<td>T/NT</td>
<td>NT/NT</td>
<td>NT</td>
<td>NT/T</td>
<td></td>
</tr>
</tbody>
</table>

- \(b_1\) and \(b_2\) refer to action of the branch 1 and branch 2. (T: taken, NT: not taken)
- \(b_1\) and \(b_2\) refer to branch 1 prediction and branch 2 prediction, respectively.
- \(b_1\) and \(b_2\) refer to the new branch 1 prediction and the new branch 2 prediction respectively.