|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DIR | GO | ESTOP | TOP | BOTM | UP | DOWN |
| 0 | 0 | 0 | 0 | 0 | **0** | **0** |
| 0 | 0 | 0 | 0 | 1 | **0** | **0** |
| 0 | 0 | 0 | 1 | 0 | **0** | **0** |
| 0 | 0 | 0 | 1 | 1 | **0** | **0** |
| 0 | 0 | 1 | 0 | 0 | **0** | **0** |
| 0 | 0 | 1 | 0 | 1 | **0** | **0** |
| 0 | 0 | 1 | 1 | 0 | **0** | **0** |
| 0 | 0 | 1 | 1 | 1 | **0** | **0** |
| 0 | 1 | 0 | 0 | 0 | **1** | **0** |
| 0 | 1 | 0 | 0 | 1 | **1** | **0** |
| 0 | 1 | 0 | 1 | 0 | **0** | **0** |
| 0 | 1 | 0 | 1 | 1 | **0** | **0** |
| 0 | 1 | 1 | 0 | 0 | **0** | **0** |
| 0 | 1 | 1 | 0 | 1 | **0** | **0** |
| 0 | 1 | 1 | 1 | 0 | **0** | **0** |
| 0 | 1 | 1 | 1 | 1 | **0** | **0** |
| 1 | 0 | 0 | 0 | 0 | **0** | **0** |
| 1 | 0 | 0 | 0 | 1 | **0** | **0** |
| 1 | 0 | 0 | 1 | 0 | **0** | **0** |
| 1 | 0 | 0 | 1 | 1 | **0** | **0** |
| 1 | 0 | 1 | 0 | 0 | **0** | **0** |
| 1 | 0 | 1 | 0 | 1 | **0** | **0** |
| 1 | 0 | 1 | 1 | 0 | **0** | **0** |
| 1 | 0 | 1 | 1 | 1 | **0** | **0** |
| 1 | 1 | 0 | 0 | 0 | **0** | **1** |
| 1 | 1 | 0 | 0 | 1 | **0** | **0** |
| 1 | 1 | 0 | 1 | 0 | **0** | **1** |
| 1 | 1 | 0 | 1 | 1 | **0** | **0** |
| 1 | 1 | 1 | 0 | 0 | **0** | **0** |
| 1 | 1 | 1 | 0 | 1 | **0** | **0** |
| 1 | 1 | 1 | 1 | 0 | **0** | **0** |
| 1 | 1 | 1 | 1 | 1 | **0** | **0** |

UP = (DIR’)(GO)(ESTOP’)(TOP’)(BOTM’) + (DIR’)(GO)(ESTOP’)(TOP’)(BOTM)

= A’BC’D’E’ + A’BC’D’E

= A’BC’D’(E’ + E)

= A’BC’D’

= (DIR’)(GO)(ESTOP’)(TOP’)

DOWN = (DIR)(GO)(ESTOP’)(TOP’)(BOTM’) + (DIR)(GO)(ESTOP’)(TOP)(BOTM’)

= ABC’D’E’ + ABC’DE’

= ABC’E’(D’ + D)

= ABC’E’

= (DIR)(GO)(ESTOP’)(BOTM’)

|  |  |  |  |
| --- | --- | --- | --- |
| Prev | GO | ESTOP | Move |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

Q = (Prev’)(GO)(ESTOP’) + (Prev)(GO’)(ESTOP’)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DIR | TOP | BOTM | UP | DOWN |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 0 | 0 |

UP: (DIR’)(TOP’)(BOTM’) + (DIR’)(TOP’)(BOTM)

UP: (DIR’)(TOP’)

DOWN: (DIR)(TOP’)(BOTM’) + (DIR)(TOP)(BOTM’)

DOWN: (DIR)(BOTM’)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| MOVE | DIR | TOP | BOTM | UP | DOWN |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 0 |

UP: (MOVE)(DIR’)(TOP’)(BOTM’) + (MOVE)(DIR’)(TOP’)(BOTM)

UP: (MOVE)(DIR’)(TOP’)

DOWN: (MOVE)(DIR)(TOP’)(BOTM’) + (MOVE)(DIR)(TOP)(BOTM’)

DOWN: (MOVE)(DIR)(BOTM’)