// CSE 4312 Assignment 1

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# Question 4: Home Alarm System

## Format

(N, A, M, S)

## Legend

K = current key

N = Number of correct keys so far in access code

L = Number of correct keys needed in access code

A = Whether the system is armed or disarmed (T or F)

M = Whether the motion detector is tripped (0 or 1)

S = Whether the siren is sounding (0 or 1)

\* = Don’t care

## Restrictions

* If The system if not armed, the siren should not go off:

## Initial State

(0, F, 0, 0)

## Tabular Expression

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Condition | Previous State | New State | | | | Result |
| K = CLEAR | K = ENTER | K = VALID | K = INVALID |
| N = 0 | (0, F, \*, 1) |  |  |  |  | Error, Siren should not sound when disarmed |
| (0, F, 0, 0) | (0, F, 0, 0) | (0, F, 0, 0) | (1, F, 0, 0) | (0, F, 0, 0) |  |
| (0, F, 1, 0) | (0, F, 1, 0) | (0, F, 1, 0) | (1, F, 1, 0) | (0, F, 1, 0) |  |
| (0, T, 0, 0) | (0, T, 0, 0) | (0, T, 0, 0) | (1, T, 0, 0) | (0, T, 0, 0) |  |
| (0, T, 1, 0) | (0, T, 1, 1) | (0, T, 1, 1) | (1, T, 1, 1) | (0, T, 1, 1) |  |
| (0, T, 0, 1) | (0, T, 0, 1) | (0, T, 0, 1) | (1, T, 0, 1) | (0, T, 0, 1) |  |
| (0, T, 1, 1) | (0, T, 1, 1) | (0, T, 1, 1) | (1, T, 1, 1) | (0, T, 1, 1) |  |
| 0 < N ^  N < L | (N, F, \*, 1) |  |  |  |  | Error, Siren should not sound when disarmed |
| (N, F, 0, 0) | (0, F, 0, 0) | (0, F, 0, 0) | (N+1, F, 0, 0) | (0, F, 0, 0) |  |
| (N, F, 1, 0) | (0, F, 1, 0) | (0, F, 1, 0) | (N+1, F, 1, 0) | (0, F, 1, 0) |  |
| (N, T, 0, 0) | (0, T, 0, 0) | (0, T, 0, 0) | (N+1, T, 0, 0) | (0, T, 0, 0) |  |
| (N, T, 1, 0) | (0, T, 1, 1) | (0, T, 1, 1) | (N+1, T, 1, 1) | (0, T, 1, 1) |  |
| (N, T, 0, 1) | (0, T, 0, 1) | (0, T, 0, 1) | (N+1, T, 0, 1) | (0, T, 0, 1) |  |
| (N, T, 1, 1) | (0, T, 1, 1) | (0, T, 1, 1) | (N+1, T, 1, 1) | (0, T, 1, 1) |  |
| N = L | (L, F, \*, 1) |  |  |  |  | Error, Siren should not sound when disarmed |
|  | (L, F, 0, 0) | (0, F, 0, 0) | Arm | | (0, F, 0, 0) |  |
|  | (L, F, 1, 0) | (0, F, 1, 0) | (0, F, 1, 0) |  |
|  | (L, T, 0, 0) | (0, T, 0, 0) | Disarm | | (0, T, 0, 0) |  |
|  | (L, T, 1, 0) | (0, T, 1, 1) | (0, T, 1, 1) |  |
|  | (L, T, 0, 1) | (0, T, 0, 1) | (0, T, 0, 1) |  |
|  | (L, T, 1, 1) | (0, T, 1, 1) | (0, T, 1, 1) |  |