## 2022 Digital IC Design Homework 2

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## Description of your design

用兩個 register(current\_state, next\_state)來記錄目前以及接下來的狀態,並用兩個乾淨的組合電路(next state combination, output logic combination)來得到正確的輸出,在 output logic combination 中當 current\_state 為

- 1. green 就把 Gout 拉為 high 。
- 2 yellow 就把 Yout 拉為 high 。
- 3. red 就把 Rout 拉為 high 。

在 next state combination 中當 current state 為

- 1. green 就把 next\_state 設為 yellow。
- 2. yellow 就把 next state 設為 red
- 3. red 就把 next state 設為 green 。

再利用一個循序電路來判斷紅綠燈狀態的變換,例:當 counter 計數到了該燈號的 duration 時就切換成下一個訊號、當 set 訊號來時就把 current\_state 強制換成 green、當 jump 訊號來時就把 current\_state 強制換成 red、當 stop 訊號來時就維持 current state 與 counter 數值等等。