2022 Digital IC Design Homework 2

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Functional Simulation Result

Stage 1	Pass	Stage 2	Pass	Stage 3	Pass

Stage 1

(your sim

```
# ----------------------
# -- Simulation Start --
# ----------------------
# --stage1 simulation--
#
# Setting1: PASS
#
# Setting2: PASS
#
# Setting3: PASS
#
# Setting4: PASS
#
# Setting5: PASS
#
# Setting6: PASS
#
# Setting7: PASS
#
# Setting8: PASS
#
# Setting9: PASS
#
# Setting10: PASS
#
```

ulation result)

Stage 2

(yo

```
#
# --stage2 simulation--
#
# Setting11: PASS
#
# Setting12: PASS
#
# Setting13: PASS
#
# Setting14: PASS
#
# Setting15: PASS
#
# Setting16: PASS
#
# Setting17: PASS
#
# Setting18: PASS
#
# Setting19: PASS
#
# Setting20: PASS
#
```

ur simulation result)

Stage 3

(your simulation result)

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。