


2023 Digital IC Design Homework 4

NAME	李亦軒		
Student ID	E14091067		
Simulation Result			
Functional simulation	100	Gate-level simulation	100
<pre>#----- # # START!!! Simulation Start # #----- # # Layer 0 output is correct ! # Layer 1 output is correct! # #----- # #----- SUMMARY ----- # # Congratulations! Layer 0 data have been generated successfully! The result is PASS!! # # Congratulations! Layer 1 data have been generated successfully! The result is PASS!! # # terminate at 56325 cycle # #----- # # ** Note: \$finish : C:/Users/PCUSER/Desktop/DIC_HW/hw4/file/testfixture.v(178) # Time: 2816250 ns Iteration: 0 Instance: /testfixture</pre>		<pre>#----- # # START!!! Simulation Start # #----- # # Layer 0 output is correct ! # Layer 1 output is correct! # #----- # #----- SUMMARY ----- # # Congratulations! Layer 0 data have been generated successfully! The result is PASS!! # # Congratulations! Layer 1 data have been generated successfully! The result is PASS!! # # terminate at 56325 cycle # #----- # # ** Note: \$finish : C:/Users/PCUSER/Desktop/DIC_HW/hw4/file/testfixture.v(178) # Time: 2816257875 ps Iteration: 0 Instance: /testfixture</pre>	
Synthesis Result			
Total logic elements	386		
Total memory bits	0		
Embedded multiplier 9-bit elements	0		
Total cycle used	56325		

Flow Summary	
 <<Filter>>	
Flow Status	Successful - Mon May 22 13:08:47 2023
Quartus Prime Version	20.1.1 Build 720 11/11/2020 SJ Lite Edition
Revision Name	ATCONV
Top-level Entity Name	ATCONV
Family	Cyclone IV E
Device	EP4CE55F23A7
Timing Models	Final
Total logic elements	386 / 55,856 (< 1 %)
Total registers	214
Total pins	82 / 325 (25 %)
Total virtual pins	0
Total memory bits	0 / 2,396,160 (0 %)
Embedded Multiplier 9-bit elements	0 / 308 (0 %)
Total PLLs	0 / 4 (0 %)
Description of your design	
<p>我設計了一有限狀態機來完成此次作業，其包含六個狀態：</p> <ol style="list-style-type: none"> 1. IDLE：等待 ready 訊號，ready 訊號拉 high 且 reset 訊號為 low 時進到 READ_IMAGE 2. READ_IMAGE：一次讀取九個位置的 pixel 值，做完卷積與 RELU 後進到 WRITE_MEM0 3. WRITE_MEM0：將結果寫入 Layer0 MEM 中，並回到 READ_IMAGE 中直到遍歷整張照片才會進到 READ_MEM0 4. READ_MEM0：將 Layer0 的結果一次讀取四個出來，Max Pooling 後 round up 並進到 WRITE_MEM1 5. WRITE_MEM1：將 round up 後的結果寫入 Layer1 MEM 並回到 READ_MEM0 直到遍歷整個 Layer0 MEM 才會進到 FINISH 6. FINISH：歸零所有暫存器並回到 IDLE 	

*Scoring = (Total logic elements + Total memory bits + 9*Embedded multipliers 9-bit elements) X Total cycle used*

*** Total logic elements must not exceed 1000.**