HW3_Report

林炫廷 111550087

August 4, 2023

1. Which part of the module in simple-single-CPU is redundant? Can you design a new instruction to use this module?
Ans:
Zero_Filled. We can design the following instruction to use this module. We take the data in register "rs" as the multiplicand, "rt" as the product, the 16-bit constant as the multiplier. To carry out this instruction using Booth's algorithm or traditional method, we need to use the "zero_filled" module to extend 16-bit constant to 32-bit constant.

muli $rs, $rt, 16_bit constant

2. Which instruction is redundant and why?
Ans:

bnez. We can achieve the same result by using the "bne" instruction and setting the register "rt" to "$zero". This change allows us to obtain the identical solution.