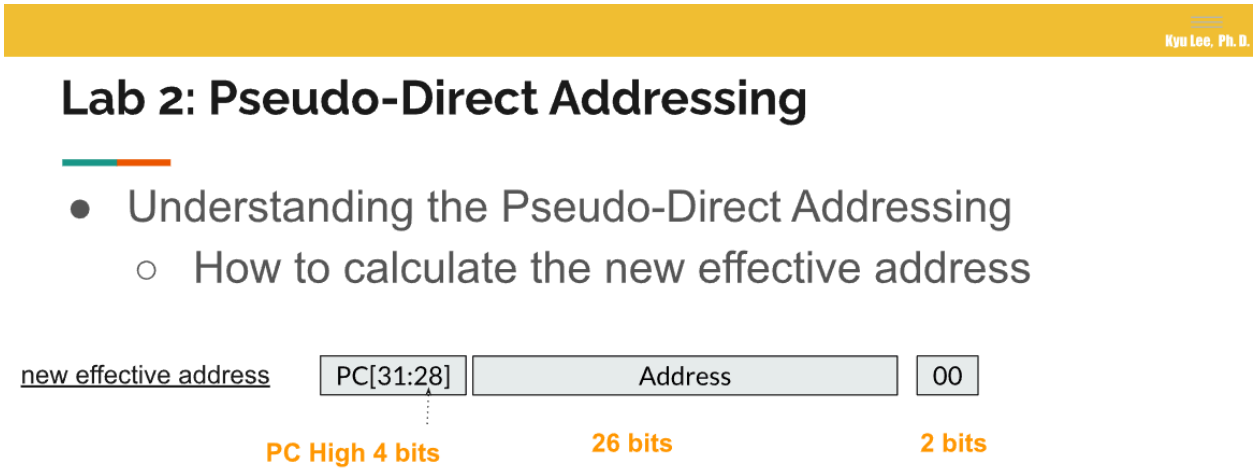
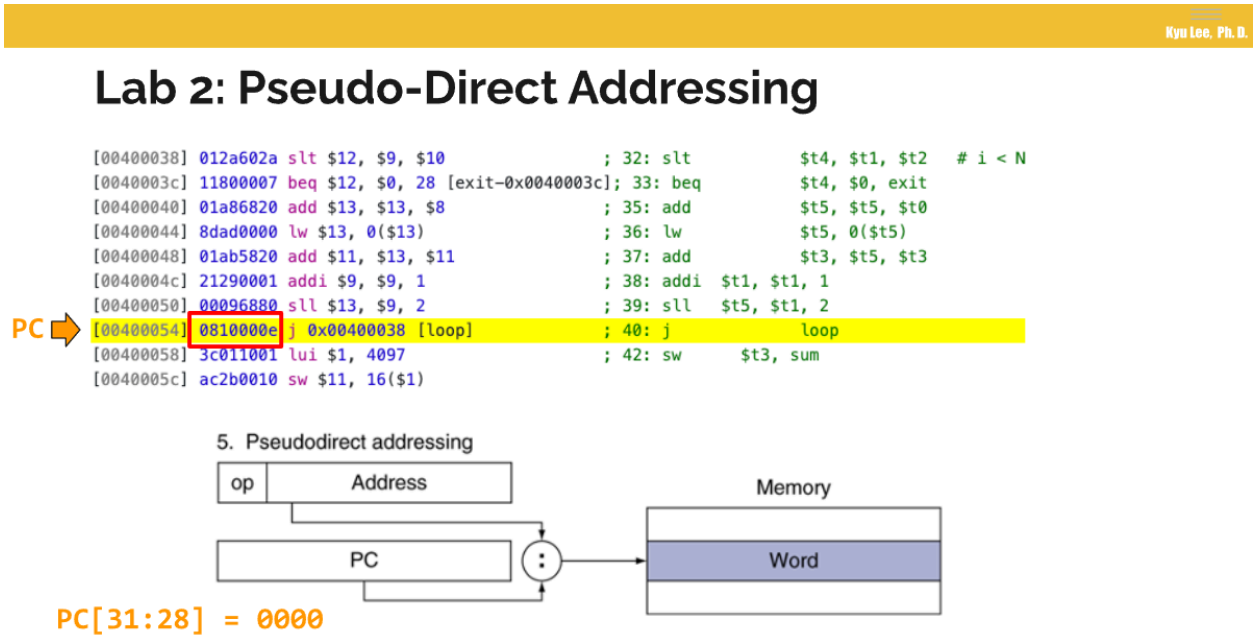
Assignment A P3 Lab 2 Pseudo-Direct Addressing

Elaborate on all the slides with the program execution results.

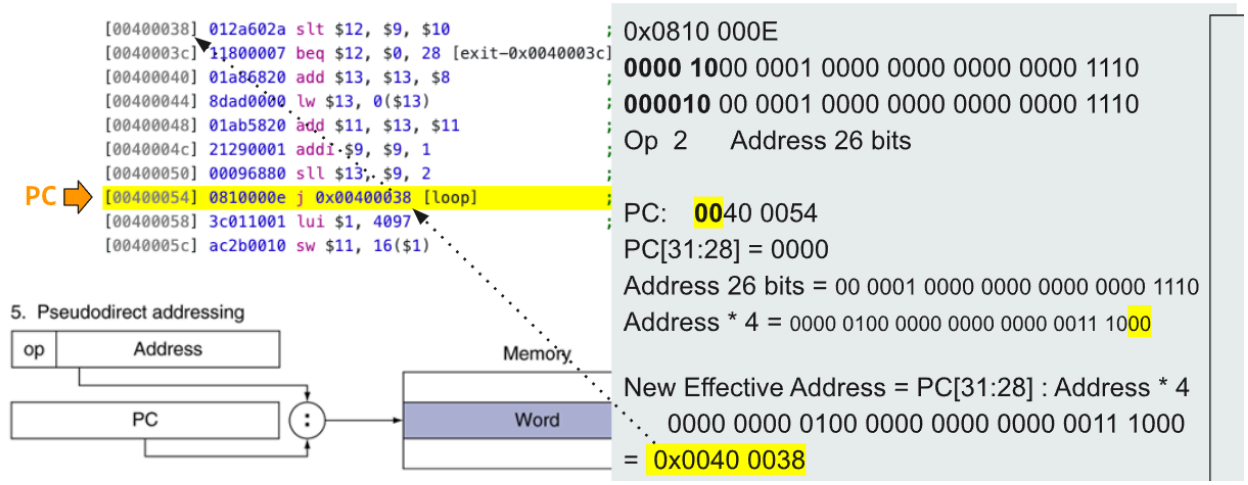


Elaboration: Pseudo-Direct Addressing explains how the **effective address** is calculated by combining the high 4 bits of the current program counter (PC[31:28]) with a 26-bit address from the instruction, and appending two trailing zero bits (00). This process results in a new 32-bit effective address used for branching or jumping in the program.



Elaboration: This showcases how the Pseudo-Direct Addressing works in MIPS assembly code. Highlighting the jump instruction (j) at memory address 0x00400054 we can see that it targets the label ‘loop’ at 0x00400038. The PC[31:28] segment is shown as 0000, and the instruction's 26-bit address (after decoding) is combined with this segment to compute the new effective address for the jump.

Lab 2: Pseudo-Direct Addressing



Elaboration: The slide showcases a detailed breakdown of the calculations involved in Pseudo-Direct Addressing for the given example. We start with the instruction binary (0x0810000E), extracts the 26-bit address (0000 1000 0000 0000 0000 0011 10), and multiply it by 4. By connecting this with the high 4 bits of the PC (0000), we get the final effective address 0x00400038, matching the target address for the jump instruction.