Computer Organization Lab 1

Member list

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1.What is the usage of $zero? What happens if you execute addi $zero, $zero, 5 ?

Ans:

In MIPS assembly language, $zero is a special register also known as $0 or $zero register. Its main purpose is to represent the constant zero, and it cannot be written to.

When the instruction "addi $zero, $zero, 5" is executed, it attempts to load the constant value 5 into the $zero register. However, since the $zero register is always zero, this instruction doesn't actually change the $zero register. Even if the instruction were valid, the $zero register would still remain as zero.

It's important to note that although the instruction appears to perform an addition operation, since the target register is the $zero register, the instruction simply loads the constant value 5 into the $zero register and doesn't produce any actual addition result.

2.How to use the stack to ensure that the value of each register is correctly saved when executing a recursive function?

Ans:

1. Before entering the recursive function, push the necessary register values onto the stack. The specific registers to be saved are typically determined by the function calling convention. For example, in MIPS architecture, commonly saved registers

include $ra (for saving the return address) and $s registers (for saving temporary data).

2. During the execution of the recursive function, if any of these registers need to be modified, first push their original values onto the stack, and then proceed with the modifications.
3. Before the recursive function completes, pop the previously saved register values from the stack to restore their original values.

3. What was the most challenging part for you in this homework?

Ans:

我認為Task3是最花時間的一題，由於該題需要利用大量的for loop印出金字塔的形狀以及倒金字塔的形狀，因此我花了蠻大量的時間在該題trace code的部分，必須清晰的了解到每一行code當下該暫存器的值，才能正確的印出。