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[0x00400020] 0x3c011001 lui $1, 4097 [value] ; 4: la $t0, value # load address 'value' into $t0
[0x00400024] 0x34280000 ori $8, $1, 0 [value] ; 5: lw $t1, 0($t0) # load word 0(value) into $t1
[0x00400028] 0x8d090000 lw $9, 0($8) ; 6: lw $t2, 4($t0) # load word 4(value) into $t2
[0x0040002c] 0x8d0a0004 lw $10, 4($8) ; 7: add $t3, $t1, $t2 # add two numbers into $t3
[0x00400030] 0x012a5820 add $11, $9, $10 ; 8: sw $t3, 8($t0) # store word $t3 into 8($t0)
[0x00400034] 0xad0b0008 sw $11, 8($8)

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In the above code, (20%) what is the "address" that value represents, (20%) and how the address is moved to the register \$8?

Answers: What the value represents (extracted from 0x3c011001 and 0x34280000) is **0x10010000**, and the address is moved to register \$8 through the two instructions, **lui \$1, 4097** and **ori \$8, \$1, 0**.

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[0x00400020] 0x3c011001 lui $1, 4097 [array] ; 5: la $a0, array
[0x00400024] 0x34240000 ori $4, $1, 0 [array] ; 6: addi $a1, $0, 0
[0x00400028] 0x20050000 addi $5, $0, 0 ; 8: addi $sp, $sp, -4
[0x0040002c] 0x23bdfffc addi $29, $29, -4 ; 9: sw $ra, 0($sp)
[0x00400030] 0xafbf0000 sw $31, 0($29) ; 11: jal swap
[0x00400034] 0x0c100011 jal 0x00400044 [swap] ; 13: lw $ra, 0($sp)
[0x00400038] 0x8fbf0000 lw $31, 0($29) ; 14: addi $sp, $sp, 4
[0x0040003c] 0x23bd0004 addi $29, $29, 4 ; 16: jr $ra
[0x00400040] 0x03e00008 jr $31 ; 25: add $t1, $a1, $a1
[0x00400044] 0x00a54820 add $9, $5, $5 ; 26: add $t1, $t1, $t1
[0x00400048] 0x01294820 add $9, $9, $9 ; 27: add $t1, $a0, $t1
[0x0040004c] 0x00894820 add $9, $4, $9 ; 28: lw $t0, 0($t1)
[0x00400050] 0x8d280000 lw $8, 0($9) ; 29: lw $t2, 4($t1) sw $t2, 0($t1)
[0x00400054] 0x8d2a0004 lw $10, 4($9) ; 30: sw $t2, 0($t1) sw $t0, 4($t1)
[0x00400058] 0xad2a0000 sw $10, 0($9) ; 31: sw $t0, 4($t1) jr $ra
[0x0040005c] 0xad280004 sw $8, 4($9) ; 32: jr $ra
[0x00400060] 0x03e00008 jr $31

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In the above code, (40%) after the code at 0x00400034 is executed, what is in PC and \$ra, and (20%) what is the purpose of the code at 0x00400060 jr \$31?

Answers: PC = 0x00400044 and \$ra = 0x00400038. The purpose of the code at 0x00400060 jr \$31 is to jump back to the caller (to the address pointed by \$ra=\$31).