

Exercises to MIPS ISA

1. Can you write MIPS code to swap two register values without using memory or any other register?

R1 = 1000 R2 = 9999
R2 = 9999 R1 = 1000



Answer: XOR R1, R2, R1
XOR R2, R1, R2
XOR R1, R1, R2

Translate the C code to MIPS

```
for (i = 0; i < 64; i++)  
{ A[i] = B[i] + C[i]; }
```

Assume that the starting addresses of A[], B[], and C[] are in \$t0, \$t1, \$t2. What's the MIPS code for this C code?

One Answer

```
Loop: add $t4, $0, $0          # 11 i is initialized to 0, $t4 = 0  
      add $t5, $t4, $t1     # 12 temp reg $t5 = address of b[i]  
      lw $t6, 0($t5)        # 13 temp reg $t6 = b[i]  
      add $t5, $t4, $t2     # 14 temp reg $t5 = address of c[i]  
      lw $t7, 0($t5)        # 15 temp reg $t7 = c[i]  
      add $t6, $t6, $t7     # 16 temp reg $t6 = b[i] + c[i]  
      add $t5, $t4, $t0     # 17 temp reg $t5 = address of a[i]  
      sw $t6, 0($t5)        # 18 a[i] = b[i] + c[i]  
      addi $t4, $t4, 4      # 19 i = i + 4  
      slti $t5, $t4, 256   # 110 $t5 = 1 if $t4 < 256, i.e. i < 64  
      bne $t5, $0, Loop    # 111 go to Loop if i < 256
```