

The University of Jordan
King Abdullah II School for Information Technology
Computer Science Department
CS 322 Computer Organizations – Quiz#1

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Translate the C code to MIPS assembly code. Use a minimum number of instructions, assume that the values of i, and sum are in registers \$s0, \$s1, respectively.

```
void Foo (int n)
{
    int i, sum = 0;
    for (i = 0; i < n; ++i)
        sum += Func (n, i);
}

int Func (int n, int i)
{
    return n + i;
}
```

```
Foo:  addi  $sp, $sp, -16      # make room in the stack for 4 registers
      sw   $s0, 12($sp)     # store saved register $s0
      sw   $s1, 8($sp)      # store saved register $s1
      sw   $a0, 4($sp)      # store argument register $s0 because Foo calls Func
      sw   $ra, 0($sp)      # store return address register $ra because Foo calls Func
      move $s2, $a0
      addi $s0, $zero, 0     # i=0
      addi $s1, $zero, 0     # sum=0
      slt  $t0, $s0, $s2     # i < n
      beq  $t0, $zero, Exit
      move $a0, $s2          # move n (in $s2) to register $a0
      move $a1, $s0          # move i (in $s0) to register $a0
      jal  Func              # call Func
      add  $s1, $s1, $v0     # sum += Func (n, i)
      addi $s0, $s0, 1       # ++i
Exit: lw   $ra, 0($sp)
      lw   $a0, 4($sp)
      lw   $s1, 8($sp)
      lw   $s0, 12($sp)
      addi $sp, $sp, 16
      jr   $ra              # return to caller address

Func: add  $v0, $a0, $a1    # return n + i
      jr   $ra              # return to caller address
```