2021141460159-邓钰川-作业1-3

2.20

```
srl $t0, $t0, 11
sll $t0, $t0, 26
ori $t2, $0, 0x03ff
sll $t2, $t2, 16
ori $t2, $t2, 0xffff
and $t1, $t1, $t2
or $t1, $t1, $t0
```

2.21

```
nor $t1, $t2, $t2
```

2.25

2.25.1

I-type

2.25.2

```
addi $t2, $t2, -1
beq $t2, $0, loop
```

2.26

2.26.1

执行两次
20

2.26.2

```c
i = 10;
do {
    B += 2;
    --i;
    } while ( i > 0)
```

7n/2

2.27

```
    addi $t0, $0, 0
    beq $0, $0, TEST1
LOOP1:
    addi $t1, $0, 0
    beq $0, $0, TEST2
LOOP2:
    add $t3, $t0, $t1
    sll $t2, $t1, 4
    add $t2, $t2, $s2
    sw $t3, ($t2)
    addi $t1, $t1, 1
TEST2:
    slt $t2, $t1, $s1
    bne $t2, $0, LOOP2
    addi $t0, $t0, 1
TEST1:
    slt $t2, $t0, $s0
    bne $t2, $0, LOOP1
```

2.28

14 instructions to implement
158 instructions executed

2.31

修订：

```
.data
    prompt1: .asciiz "Enter the number\n"
        prompt2: .asciiz "The fib(n) is:\n"
 .text
    li $v0, 4
    la $a0, prompt1
    syscall
    li $v0, 5
    syscall
 # Call factorial
    move $a0, $v0
    jal fib
    move $a1, $v0 # save return value to a1
 # Print prompt2
    li $v0, 4
    la $a0, prompt2
    syscall
 # Print result
    li $v0, 1
    move $a0, $a1
    syscall
 # Exit
    li $v0, 10
    syscall
fib:
    beqz $a0,zero #n==0
    beq $a0,1,one #n==1
    sub $sp,$sp,4
    sw $ra,0($sp)
    sub $a0,$a0,1
    jal fib
    lw $ra,0($sp)
    add $sp,$sp,4
    sub $t1,$v0,2 # n - 2
    sub $t2,$v0,1 # n - 1
    add $v0,$t1,$t2 # add n-2,n-1
    jr $ra
zero:
    li $v0,0
```

```
    jr $ra
one:
    li $v0,1
    jr $ra
```

0的情况一共3条，1的情况一共4条，其他是$3*2^{n-2}+4*2^{n-1}$
运行结果：

```
Enter the number
0
The fib(n) is:
0
— program is finished running —
```

```
Enter the number
1
The fib(n) is:
1
— program is finished running —
```

```
Enter the number
3
The fib(n) is:
2
— program is finished running —
```

2.34

修订：

```
f:
    addi $sp,$sp,-4 #常规开栈操作，存三个栈
    sw $ra,0($sp)
    addi $sp,$sp,-4
    sw $s1,0($sp)
    addi $sp,$sp,-4
    sw $s0,0($sp)
    move $s1,$a2
    move $s0,$a3
    jal func       #计算func (a, b)
    move $a0,$v0
    add $a1,$s0,$s1    #计算c+d
    jal func
    lw $ra,8($sp)
    lw $s1,4($sp)
    lw $s0,0($sp)
    addi $sp,$sp,12
    jr $ra
```