CS1520 Practical 3 - solutions

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Listing 1: division.asm

```
.global main
main:
@ Divide two positive integers a and b.
@
@ a is in r2
@ b is in r3
@ the ratio a/b will be in r0
@ the remainder will be in r1

mov r2, #13 @ a=13
mov r3, #3  @ b=3

@ Check if b=0, and if so terminate the program
cmp r3, #0
moveq r0, #0
moveq r1, #0
beq finish

mov r0, #0
mov r4, #0  @ r4 holds the partial sum S

@ This (very inefficient) algorithm works
@ by figuring out how many b's we need to
@ add to the partial sum S before S becomes
@ greater than a. The ratio is then
```

```
@ given by the number of b's minus one.
loop:
add r0, #1
add r4, r3
cmp r4, r2
ble loop
sub r0, #1

@ The remainder r is given by
@    r = a - b*q
@ where q is the ratio, stored in r0
mul r5, r0, r3
sub r1, r2, r5

finish:
mov r7, #1
svc #0
.end
```