Lab 05 Solutions
 ARM Registers
 ARM Execution
 Control
    conditionals (if/then/else)
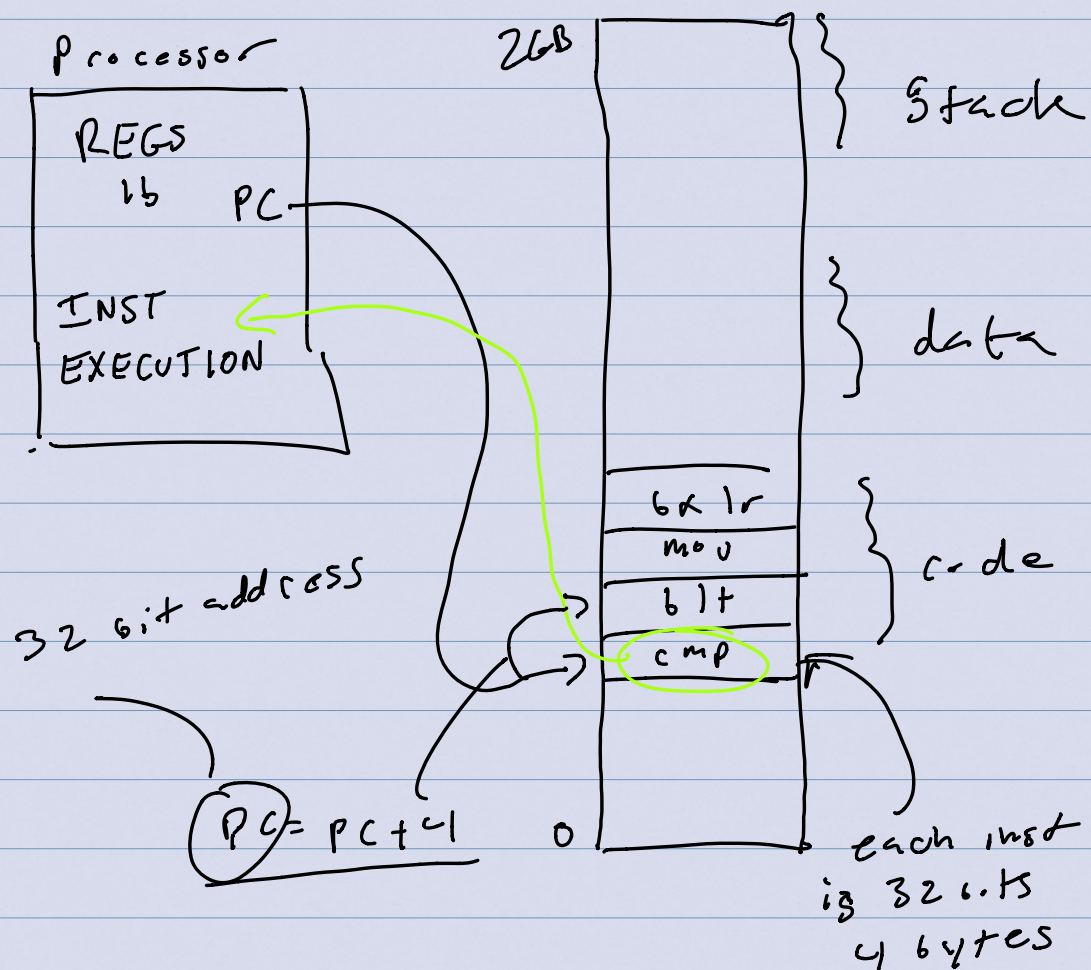   loop   (for/while)
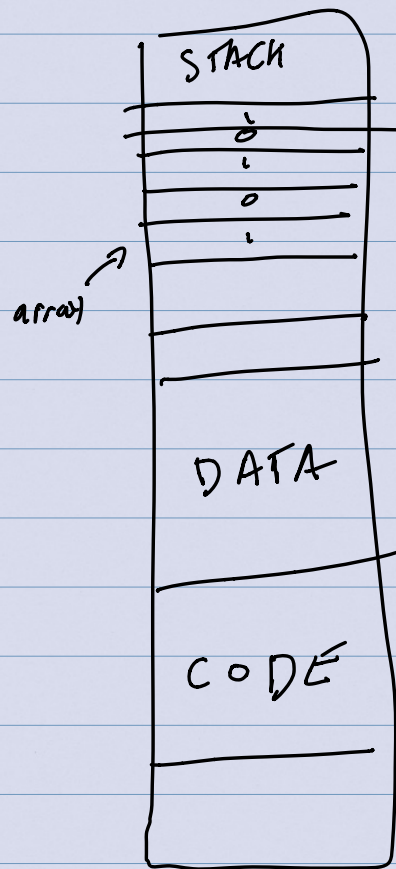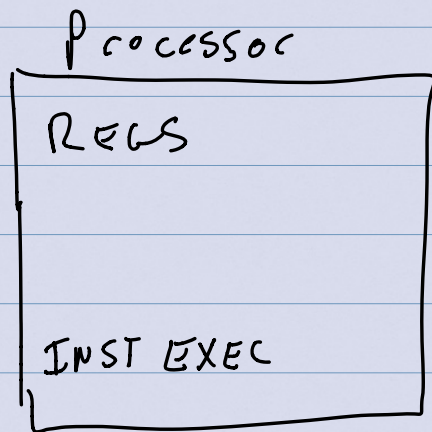 Memory - memory access
    Arrays
 Function calls

gdb

Processor   2GB   Stack

REGS
1b   PC

INST
EXECUTION   data

                                          6x lr
                                          mov   code
                          32 bit address   blt
                                          cmp

            PC = PC + 4   0   each inst
                                               is 32 bits
                                               4 bytes

Memory

Processor

REGS

INST EXEC

STACK

0
1
0
1

array →

DATA

CODE

```
ldr r0, [r1]
str r0, [r1]
```

load data into reg

store register

ldr r0, [r1]
str r0, [r1]

C code

r0 = *r1;
*r1 = r0;

```
.globa count_zeros_s
count_zeros_s:
        mov  r2, #0    /* count = 0 */
        mov  r3, #0    /* i = 0 */


count_zeros loop:
        cmp  r3, r1       /* i < len ? */
        bge  count_zeros_loop_end
        ldr  r12, [r0]       /* r12 = *array */
        cmp  r12, #0
        bne  count_zeros_not_zero
        add  r2, r2, #1
count_zeros_not_zero:
        add  r0, r0, #4
        add  r3, r3, #1  ⟵
        b    count_zeros_loop
count_zeros_loop_end:
        mov  r0, r2
        bx   lr
```