HW1
CMPE364: Microprocessor Based Design
Spring 2017

Question 1
Write a single ARM assembly instruction equivalent to the following instruction sequence:

```
MOV r12, r12, ROR #4
ADD r12, r4, r12
```

```
ADD r12, r4, r12 ROR #4
```

Question 2
Write a single ARM assembly instruction which will multiply an integer stored in r5 by 65, placing the product in r6. *Do not* use an explicit multiplication instruction (MLA, MUL, SMLAL, or SMULL).

```
ADD r6, r5, r5 LSL #6
```

Question 3
Write a single ARM assembly instruction equivalent to the following:

```
MOV r10, #0x22
SUB r11, r10, r8
```

```
RSB r11, r8, #0x22
```

Question 4
Write a short ARM assembly program which loads the value `0x08CB85A1` into register r0. You may only use the instructions `MOV`, `AND`, `OR`, as well as the barrel shifter. Assume all source registers may be used as scratch registers.

```
MOV r0, #0x08000000
ORR r0, r0, #0x00CB0000
ORR r0, r0, #0x00008500
ORR r0, r0, #0x000000A1
```

Question 5
Write a short ARM assembly program which implements the following line of high level language pseudocode. Assume all source registers may be used as scratch registers.

```
r0 := (r3 + r4) / 16 + 95 - (r1 * r2)
```

```
ADD r3, r3, r4
MOV r0, r3, LSR #4
ADD r0, r0, 95
MUL r1, r2, r1
SUB r0, r0, r1
```