## **Homework Assignment 4**

## (Due 2:10pm, Dec. 9, email to daehyun.kim@wsu.edu or submit a hardcopy)

You should use the following instructions only.

- Instructions
  - o ADD, SUB, AND, ORR, EOR, MOV, MUL
  - o CMP, BGE/BLT/BGT/BLE/BEQ/BNE
  - o B, BL, BX
  - o LDR, STR, PUSH, POP
- 1. (100 points) Write an assembly code for the "for loop" in the following C code.

```
int x[10];
                                             R15
                                                                       0x0414
                                                                                    x[0]
int* y = new int[10];
                                                                       0x0410
                                             R14
                                       R13 (SP)
                                                                       0x040C
                                                    0x0400
                                                                                     У
for ( int k = 0; k < 10; k++) {
                                            R12
                                                                       0x0408
                                                        •••
                                                                                     • • •
 if (x[k]\%2 == 0)
  y[k] = x[k];
                                                                       0x0404
                                                       RF
 else
                                                                       0x0400
  y[k] = x[k] + 1;
                                                                       0x03FC
                                                                                     ...
                                                                       0x03F8
                                                                                     ...
```

Main memory

- R0-R12 are freely available.
- You can use any of R0-R12 for "int k" (i.e., you don't need to use the stack for k).
- 2. (100 points) Write an assembly code for the "for loop" in the following C code.

```
struct Student {
                                           R15
                                                                    0x0414
                                                      ...
                                                                                  ...
 int id:
                                           R14
                                                                    0x0410
                                                                                x[1].id
 int year;
 int month;
                                      R13 (SP)
                                                   0x03F8
                                                                    0x040C
                                                                              x[0].month
                                           R12
                                                                    0x0408
                                                                               x[0].year
Student x[10];
                                                                    0x0404
                                                                                x[0].id
                                                     RF
Student* y = new Student[10];
                                                                    0x0400
                                                                    0x03FC
                                                                                   У
                                                                    0x03F8
for (int k = 0; k < 10; k++) {
 y[k].id = x[k].id;
                                                                             Main memory
y[k].month = x[k].month;
```

- R0-R12 are freely available.
- You can use any of R0-R12 for "int k" (i.e., you don't need to use the stack for k).