

Homework Assignment 3

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

You should use the following instructions only.

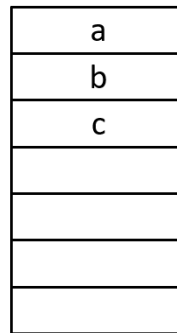
- Instructions
 - ADD, SUB
 - AND, ORR, EOR
 - CMP, BGE/BLT/BGT/BLE/BEQ/BNE
 - B, BL, BX
 - MOV
 - LDR, STR

1. (50 points) Write an assembly code for the following C code (the line `c=comp()` in the main function and the `comp()` function).

```
int main () {  
    int a, b, c;  
    ...  
    c = comp (a,b,a+b);  
    ...  
}
```

```
int comp (int x, int y, int z) {  
    if ( (x-y) > z )  
        return 1;  
    else  
        return 0;  
}
```

SP →



Main memory

(a)

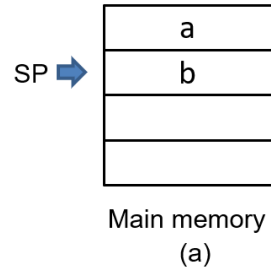
(b)

- In the main function, assume that R0-R12 are being used by other variables (right before the function call `c=comp(a,b,a+b)`). This means, if you want to use any of them, you should preserve their values.
- Use the stack memory for the function arguments and the return value.
- You don't need to preserve the value of LR in the `comp` function because it is a leaf function.

2. (50 points) Write an assembly code for the following C code (the line `b=add(a)` and the `add()` function).

```
int main () {
    int a, b;
    ...
    b = add (a);
    ...
}

int add (int x) {
    if ( x == 1 )
        return 1;
    else
        return (x + add(x-1));
}
```



- In the main function, assume that R0-R12 are being used by other variables (right before the function call `b = add(a)`). This means, if you want to use any of them, you should preserve their values.
- Use the stack memory for the function arguments and the return value.