

Homework Assignment 3

(Due 2:10pm, Nov. 8, scan (or take a photo) and upload it in Canvas)

You should use the following instructions only.

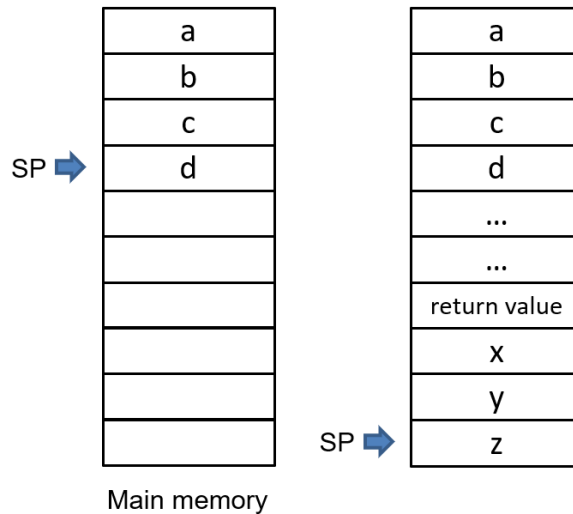
- Instructions
 - ADD, SUB
 - AND, ORR, EOR
 - CMP, BGE/BLT/BGT/BLE/BEQ/BNE
 - B, BL, BX
 - MOV
 - LDR, STR

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

```
int main () {  
    int a, b, c, d;  
    ...  
    d = com (a, b, c);  
    ...  
}
```

```
int com (int x, int y, int z) {  
    if ( x == 2 )  
        return y;  
    else if ( x == 4 )  
        return z;  
    else if ( x == 6 )  
        return (y + z);  
  
    return x*x;  
}
```

(a)



(b)

(c)

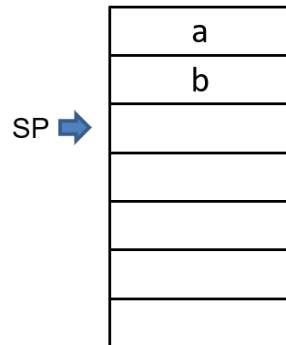
- In the main function, assume that R0-R12 are being used by other variables (right before the function call `c=com(a,b,c)`). This means that you should preserve their values if you want to use any of them.
- Use the stack memory for the function arguments and the return value (shown in (c)).
- You should implement the multiplication yourself. (Do not use MUL)

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 = com (a);
  ...
}

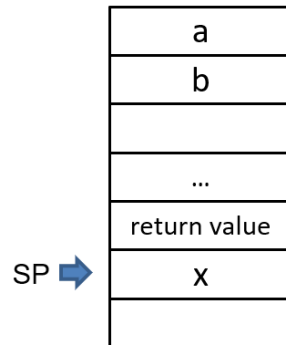
int com (int x) {
  if ( x <= 2 )
    return 5;

  return com(x-1) + com(x-2);
}
```



Main memory

(b)



(c)

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