

UNCC, Department of Electrical and Computer Engineering
ECGR4101/5101, Fall 2009, Homework #3, Due: 9/23/09, at the beginning of class (20 points)

Consider the following listing of a program compiled from C. It includes the original C source code as comments for clarity. Show the contents of the stack and registers R0, R1, SP and FB just before the exitd in \$f2 executes. Also identify what each byte represents (e.g. LSB (least significant byte) of argument, MSB of variable, dynamic link, etc.). Assume that execution starts at the beginning of f1, at which point FB is 0944h and SP is 0940h. Assume that the address of the mov.w instruction following jsr \$f2 is ff118h. Use ? to indicate values which are unknown or in boxes which are not used.

```

;## # FUNCTION f2
;## # FRAME AUTO (    arg) size  2,  offset -2
;## # REGISTER ARG (    arg) size  2,  REGISTER R1
;## # ARG Size(0) Auto Size(2) Context Size(5)
;## # C_SRC :      int f2(int arg) {
$f2:
    enter #02H
    mov.w R1,-2[FB] ; arg arg
;## # C_SRC :      return arg+5;
    mov.w -2[FB],R0 ; arg
    add.w #0005H,R0
    exitd

;## # FUNCTION f1
;## # FRAME AUTO (    b) size  2,  offset -2
;## # FRAME AUTO (    a) size  2,  offset -2
;## # ARG Size(0) Auto Size(2) Context Size(5)
;## # C_SRC :      void f1(void) {
_f1:
    enter #02H
;## # C_SRC :      int a=10, b;
    mov.w #000aH,-2[FB] ; a
;## # C_SRC :      b = f2(a);
    mov.w -2[FB],R1 ; a
    jsr  $f2
    mov.w R0,-2[FB] ; b
;## # C_SRC :      }
    exitd

```

| Address | Contents | Description _____ |
|---------|----------|-------------------|
| 933 | | |
| 934 | | |
| 935 | | |
| 936 | | |
| 937 | | |
| 938 | | |
| 939 | | |
| 93a | | |
| 93b | | |
| 93c | | |
| 93d | | |
| 93e | | |
| 93f | | |
| 940 | | |

| Register | Contents |
|----------|----------|
| R0 | |
| R1 | |
| SP | |
| FB | |