

Student Name: _____ Student ID: _____

Problem 3

Below is the code for a simple subroutine (do_it) that uses one local variable implemented with a stack frame. Given the initialized values in the table, fill in the rest of the table describing the registers and memory locations at different times during the execution of the function.

```

TEMP      set      -1
do_it:    pshb
          pshx
          tsx
          leas     TEMP,SP
          movb    #$20, TEMP, X
          suba    TEMP, X
          txs
          pulx
          pulb
          rts
    
```

Location	Prior to JSR	After LEAS	After SUBA	AFTER RTS
a	10			
b	1			
x	1000			
y	3000			
sp	2002			
mem 1ff9	0			
mem 1ffa	0			
mem 1ffb	0			
mem 1ffc	0			
mem 1ffd	0			
mem 1ffe	0			
mem 1fff	0			
mem 2000	0			
mem 2001	0			

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```
GREEN    EQU    $01
YELLOW   EQU    $02
RED      EQU    $04

GREENS:  ldab   PORTB
        cmpb  #GREEN
        bne  YELLOWS
        inc  count
        asl  PORTB
        bra  FINISH
YELLOWS: cmpb  #YELLOW
        bne  REDS
        inc  count
        asl  PORTB
        bra  FINISH
REDS:   cmpb  #RED
        bne  default
        inc  count
        asl  PORTB
        bra  FINISH
ELSE:   movb  #GREEN, PORTB
FINISH:
```

Write a segment of C code that is equivalent?

If this code was run and PORTB initially contained the value #08, what registers/memory locations would change and to what value(s)?

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Problem 3 Short answer.

1) Name one advantage of Reverse Polish Notation.

2) Describe one enhancement that Freescale (Motorola) made to speed up FOR loops in the HCS12.