F. 13 Chapter 13 Solutions

13.1

Name	Type	Offset	Scope
operand1	int	0	main
operand2	int	-1	main
operation	char	-3	main
result	int	-2	main

13.3

if (a) else

x

=

b

;

x

=

c

;

13.5

```
        AND     R0, R0,     #0      ;       init r0     at 0
        LDR     R1, R5,     #0
        BRz     CASE_1              ;       compare     x==0
        ADD     R1, R1,     #-1
        BRz     CASE_2              ;       compare     x==1
        BR      CASE_DEF        ; goto default case
CASE_1:
        ADD         R1, R0, #3
        STR         R1, R5, #-1 ; y = 3
CASE_2:
        ADD         R1, R0, #4
        STR         R1, R5, #-1 ; y = 4
        BR          END_SWITCH    ; break
```

```
CASE_DEF:
        ADD         R1, R0, #5
        STR         R1, R5, #x 1 ; y = 5
        BR          END_SWITCH    ; break
END_SWITCH:
        .
        .
        .
```

13.7 This if-else statement **cannot** be converted into a switch statement. All cases labels must be integral constants. The if conditional (x == y) cannot be converted into a case label for the switch.

13.9 a. 0
b. 0
c. 11 4

13.11

```
#include <stdio.h>
#define TRUE 1
#define FALSE 0

int main()
{
        char nextChar; /* Next character in email address */ int gotAt = FALSE; /*
        Indicates if At @ was found */ int gotDot = FALSE; /* Indicates if Dot . was found
        */ int charCount = 0;
        printf("Enter your email address: ");
        do {
                scanf("%c", &nextChar);
                charCount++;

                if (nextChar == '@' && charCount > 1) {
                        gotAt = TRUE;
                        charCount = 0;
                }

                if (nextChar == '.' && gotAt == TRUE && charCount > 1) { gotDot =
                     TRUE;
                     charCount = 0;
                }
        }
        while (nextChar != ' ' && nextChar != '\n');

        if (gotAt == TRUE && gotDot == TRUE && charCount > 1) printf("Your email
            address appears to be valid.\n");
        else
            printf("Your email address is not valid!\n");
  }
```

13.13

```
#include <stdio>

int main()
{
        int i; int
        sum;
```

```
        i = 0;

        do
        {
                if (i % 4 == 0)
                        sum = sum + 2;
                else if (i % 4 == 1)
                        sum = sum - 6;
                else if (i % 4 == 2)
                        sum = sum * 3; else if
                (i % 4 == 3)
                        sum = sum / 2;


                i++;

        }
        while (i <= 100);

        printf("%d\n", sum);
}
```

13.15

a.
```
for ( ; condition; )
        loopbody;
```

b.
```
init;
while (condition)
{
        loopbody;
        reinit;
}
```

13.17 It counts the number of bits that are set in the two's complement representation of the integer provided by the user.

13.19 Unlike the initializer in a for-loop, the condition of a while loop is evaluated at the beginning of every iteration. A new declaration of the iteration variable would break the syntactical rules of declaration (one declaration of a variable per scope).

Questions in the text denoted by the question mark icon:

Page 353 It “echoes” the user input back to the monitor. Page 355

Loop 1: 0 1 2 3 4 5 6 7 8 9 10

Loop 2: a b c d e f g h i j k l m n o p q r s t u v w x y z

Loop 3: Counts the number of bits that are set in inputValue