A Different Routine to Convert 8-bit Hex to 3 Ascii Characters

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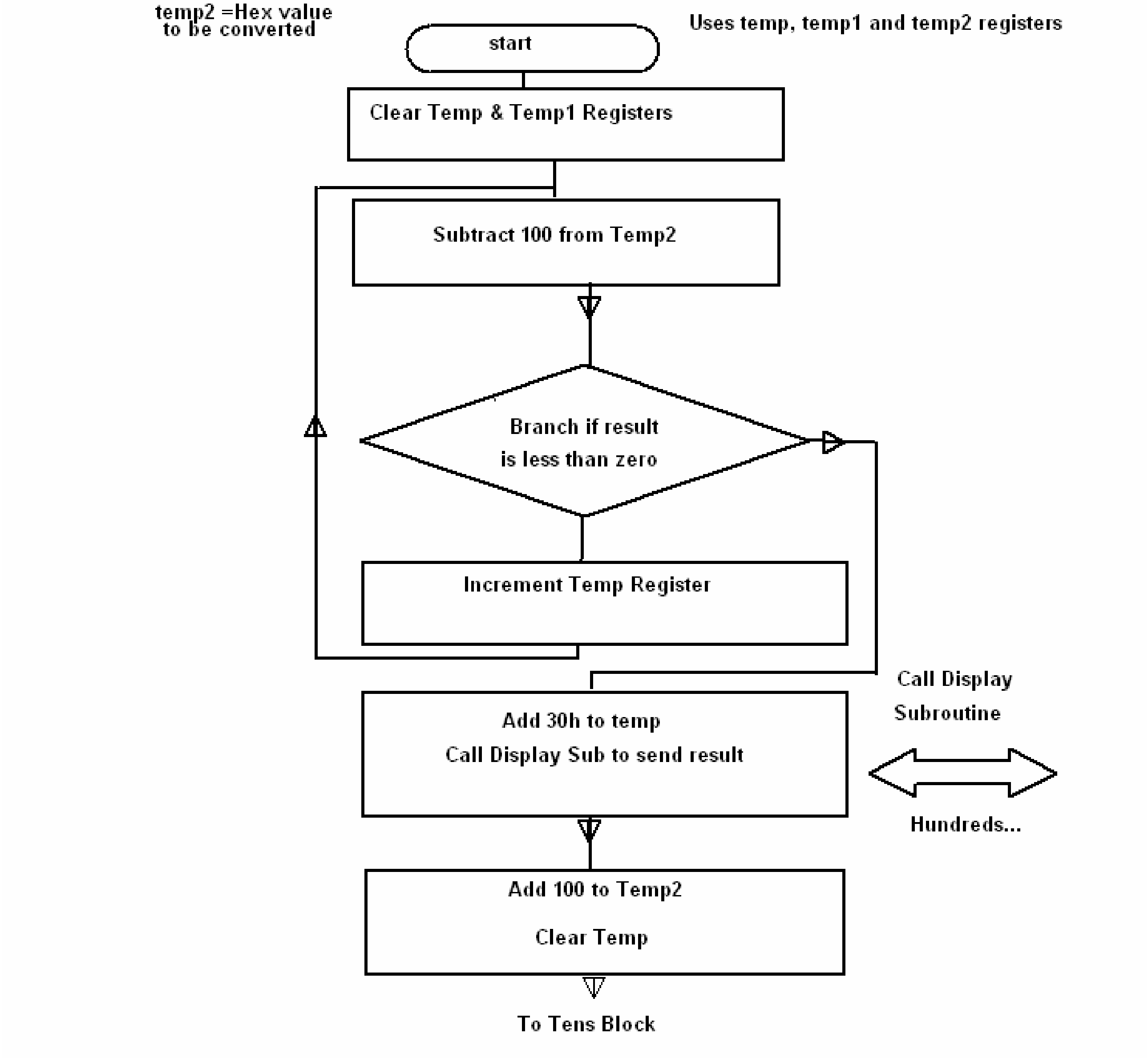
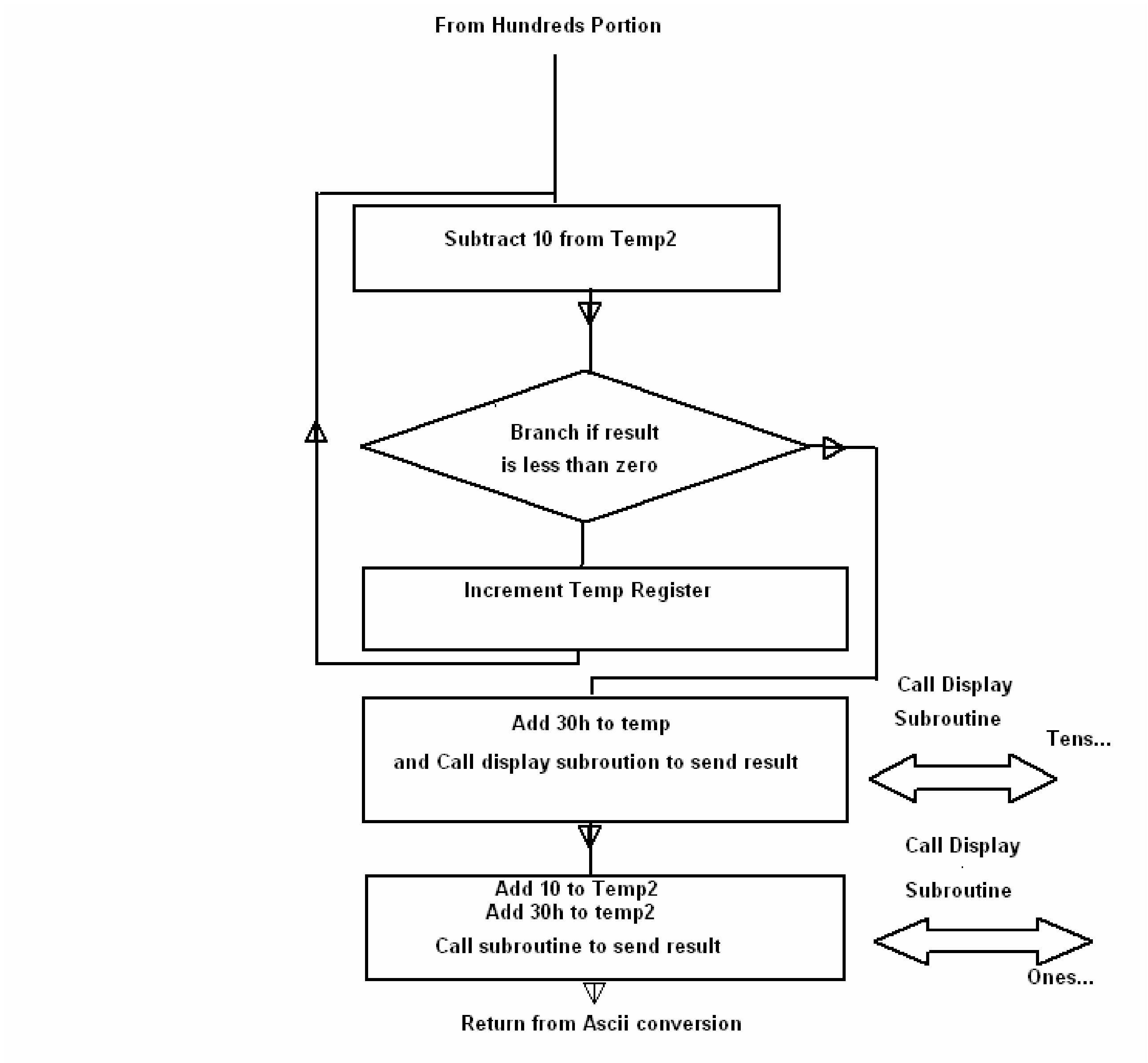
In the job of doing software coding, the programmer is often left with the task of converting some 8-bit hex value to a decimal number. The proliferation of those 2-line display modules that "take-in" ASCII characters necessitates some kind of conversion to ASCII. For example, you could read an A/D input and want to display that reading on the display. The maximum value is 255 and so this would consume 3 characters on the display. As they are ASCII characters that get sent to the display the number 255 would require as hex values to send: 32, 35 and 35.

What makes this routine different is: (a) it takes less lines of code and (b) it consumes less registers. It does so by taking advantage of the fact that the display modules sequentially feed in the digits—thus one can do the hundreds conversion, send to the display, tens conversion and send to the display and lastly one's and send to the display. Here is the flow chart:





And here is the assembler code:

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;***********************************ASCII CONVERT AND DISPLAY***************
;SUBROUTINE
;ATMEL AVR CODE…used with an AT2313 and ATMEGA48
TAKES IN TEMP2 AS HEX CHARACTER TO BE CONVERTED TO 3 SEPARATE ASCII CHARACTERS
;USES TEMP AND TEMP1 AND TEMP2…previously defined to be registers in the R16 to R31 rannge
;SETS DISPLAY TO NEXT TO LAST 3 DIGITS
;NOTE THAT DISDATA IS YOUR SUROUTINE CALL TO DISPLAY THESE CONVERTED CHARACTERS


ASCIIALONE:
        CLR TEMP
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HUNDREDSLOOP:
        SUBI TEMP2, 100 ;STAY TUNED...WE USE TEMP2 TO FIGURE THE NUMBER OF TENS LATER
        BRLO OUTANDTENS ;IF LOWER GETS OUT
        INC TEMP ;THIS IS HOW MANY HUNDREDS
        RJMP HUNDREDSLOOP
OUTANDTENS:
        LDI TEMP1, 0X30 ;
        ADD TEMP, TEMP1 ;MAKES IT AN ASCII NUMBER
        RCALL DISDATA ;SENDS OUT MOST.SIG OF QUANTITY=3 ASCIII DIGITS
        LDI TEMP, 100
        ADD TEMP2, TEMP ;RESTORES IT BACK,..FOR TENS CALCULATION
        CLR TEMP
NUMTENSLOOP:
        SUBI TEMP2, 10
        BRLO OUTANDONES
        INC TEMP ;THIS IS HOW MANY TENS
        RJMP NUMTENSLOOP
OUTANDONES:
        LDI TEMP1, 0X30
        ADD TEMP, TEMP1
        RCALL DISDATA           ;THIS IS #2 ASCIII SEND OUT
        LDI TEMP, 10
        ADD TEMP2, TEMP ;RESTORES IT BACK...
        LDI TEMP1, 0X30 ;MAKES IT ASCII NUMBER
        ADD TEMP2, TEMP1
        MOV TEMP, TEMP2 ;NEEDS IT IN RIGHT REGISTER
        RCALL DISDATA ;LAST ONE...OUT IT GOES…REPLACE DISDATA WITH YOUR DISPLAY SUB
        RET

DISDATA: ; Your subroutine that displays the ASCII characters below
Yada
Yada

RET
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