ConvertCtoF

Write a subroutine that convert a temperature reading in Celsius (Variable C) to Fahrenheit (variable F).

Using Cmax value (124)

From the calculation 124 degree Celsius = 255.2 degree Fahrenheit.

Using Cmin Value (0)

From the calculation 0 degree Celsius = 32 degree Fahrenheit.

C random value (74)

```
Processor                ▼ ×

Name          Value   ▲
Stack Pointer  0x08FD
X pointer      0x0020
Y pointer      0x0000
Z pointer      0x0000
Cycle Counter  834
Frequency      1.0000 M
Stop Watch     834.00 u
SREG           ☐☐☐S
 Registers
  R00          0x34
  R01          0x05
  R02          0x00
  R03          0x00
  R04          0x00
  R05          0x00
  R06          0x00
  R07          0x00
  R08          0x00
  R09          0x00
  R10          0x00
  R11          0x00
  R12          0x00
  R13          0x00
  R14          0x00
  R15          0x00
  R16          0x12
  R17          0x4A
  R18          0x4A
  R19          0x0A
  R20          0x00
  R21          0x00
  R22          0xA5
  R23          0xFF
  R24          0x02
  R25          0x00
  R26          0x20
  R27          0x00
  R28          0x00
  R29          0x00
```

```asm
.INCLUDE <m328pdef.inc>

.DSEG
        C: .BYTE 1
        F: .BYTE 1

.CSEG

.DEF Denominator=R19
.DEF Quotient=R22

.ORG 0x0000


//Input a celsius value into r17
TestConvertCtoF:
    ldi r17,74
    sts C, R17
    //call subroutine ConvertCtoF
    rcall ConvertCtoF
    rjmp TestConvertCtoF

/****************************
 * subroutine converts a temperature reading in Celsius (variable C) to Fahrenheit (variable F).
 * F=(C × 9/5) + 32 ==(C × 18/10) + 32
 * Range for C input is from (0 to 124), since F max is 255
 ****************************/

ConvertCtoF:
    //Load the C value into r18
    lds r18, C
    //Input the constant value 18 in reg. 16
    ldi r16,18
    //This part calculates (C*18)
    mul r18, r16
    //Move the products into r25H and r24L
    movw r25:r24, r1:r0
    //Input the denominator into r19
    ldi Denominator, 10  //r19,10
    //Call the 16 bit by 8 bit division
    rcall Div16_8
    // add 32 to the quotient (18*C)/10 + 32
    ldi  r26,32
    add  Quotient,r26   //r22,r26
    adc  r23,r2

    //Store the answer into F
    sts  F, r22
    ret
```

```
Watch                                                                ×
Name            Value        Type        Location
  C             74 'J'       SRAM Locat: 0x0100 [SRAM]
  F             165 '¥'      SRAM Locat: 0x0101 [SRAM]
  R24           2 '↲'        Register    R24




 ◄ ◄ ► ►  \ Watch 1 / Watch 2 / Watch 3 / Watch 4 /
```

From the calculation 74 degree Celsius = 165.2 degree Fahrenheit.