Assembly Language Programming Exercise
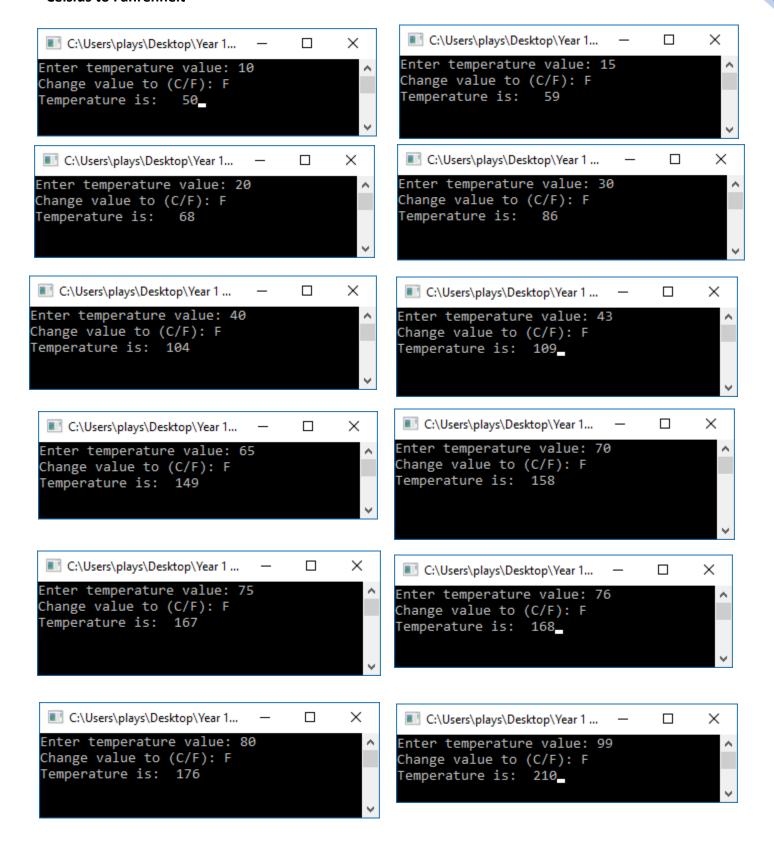## *Option 1*

Code:

```
.586
.model flat, stdcall
option casemap :none
.stack 4096
extrn ExitProcess@4: proc

GetStdHandle proto   :dword
ReadConsoleA  proto :dword, :dword, :dword, :dword, :dword
WriteConsoleA proto :dword, :dword, :dword, :dword, :dword
MessageBoxA proto    :dword, :dword, :dword, :dword
STD_INPUT_HANDLE equ -10
STD_OUTPUT_HANDLE equ -11

.data

intro_string db "Enter temperature value:",0
convert_string db "Change value to (C/F):",0

bufSize = 80
            inputHandle DWORD ?
        buffer db bufSize dup(?)
        bytes_read  DWORD  ?
sum_string db "Temperature is:",0
            outputHandle DWORD ?
bytes_written dd ?
actualNumber dw 0
converter dw 0
asciiBuf db 4 dup (" ")

.code
main:         ; main Procedure begins from here

invoke GetStdHandle, STD_OUTPUT_HANDLE    ; Outputs the first line
        mov outputHandle, eax
mov    eax,LENGTHOF intro_string                 ; length of intro_string
invoke WriteConsoleA, outputHandle, addr intro_string, eax, addr bytes_written, 3

        invoke GetStdHandle, STD_INPUT_HANDLE ; Reads user input
        mov inputHandle, eax
            invoke ReadConsoleA, inputHandle, addr buffer, bufSize, addr bytes_read, 5
sub bytes_read, 2                                  ; -2 to remove cr,lf
        mov ebx,0

mov al, byte ptr buffer+[ebx]
sub al,30h
add    [actualNumber],ax

getNext:
inc    bx
```

```
cmp ebx,bytes_read
jz cont
mov    ax,10
mul    [actualNumber]
mov actualNumber,ax
mov al, byte ptr buffer+[ebx]
sub    al,30h
add actualNumber,ax

jmp getNext
; Converts user input to readable number

cont:
invoke GetStdHandle, STD_OUTPUT_HANDLE    ; Prompts to the user to enter the conversion
          mov outputHandle, eax
mov    eax,LENGTHOF convert_string               ; length of convert_string
invoke WriteConsoleA, outputHandle, addr convert_string, eax, addr bytes_written, 3

;-----------------READING CONVERTER --------------------;

; Reads conversion character that the user entered
          invoke GetStdHandle, STD_INPUT_HANDLE
          mov inputHandle, eax
              invoke ReadConsoleA, inputHandle, addr buffer, bufSize, addr bytes_read, 5

sub bytes_read, 2                                        ; -2 to remove cr,lf
              mov ebx,0

mov al, byte ptr buffer+[ebx]
sub al,30h
add    [converter],ax

CMP    ax, 22                                            ; Checks for user input if it
matches
jz    centTOfarenFunct                                  ; Then jumps to the certain procedure

CMP    ax, 19
jz farenTOcentFunct

;-------------------------------------------------------;
continue:

; Outputs to the console the line giving the temperature result
invoke GetStdHandle, STD_OUTPUT_HANDLE
          mov outputHandle, eax
mov    eax,LENGTHOF sum_string                          ;length of sum_string
invoke WriteConsoleA, outputHandle, addr sum_string, eax, addr bytes_written, 3

mov ax,[actualNumber]
mov cl,10
mov    ebx,3
nextNum:
div    cl
add    ah,30h
mov byte ptr asciiBuf+[ebx],ah
dec    ebx
mov    ah,0
cmp al,0
ja nextNum
mov    eax,4
```

```
; Outputs to the console the converted temperature
        invoke WriteConsoleA, outputHandle, addr asciiBuf, eax, addr bytes_written, 0

; Outputs a message box with the converted temperature
invoke MessageBoxA, 0, addr asciiBuf, addr sum_string,16

mov eax,0
mov eax,bytes_written
push   0

call   ExitProcess@4                              ; Calls the exit process and ends the program

centTOfarenFunct:
call centTOfaren
jmp continue

centTOfaren    PROC
mov     ax,9
mov  cx, [actualNumber]          ; cx = [actualNumber]
mul  cx                                 ; ax = ax * cx

mov [actualNumber],ax

mov  ax, [actualNumber]     ; ax = [actualNumber]
mov  cx, 5                              ; cx = 5
div  cx                                 ; ax = ax / cx

add ax,32

mov [actualNumber],ax
ret
centTOfaren    ENDP

farenTOcentFunct:
call farenTOcent
jmp continue


farenTOcent    PROC
mov ax,[actualNumber]
sub ax,32

mov  cx, 5                              ; cx = 5
mul  cx                                 ; ax = ax * cx

mov  cx, 9                              ; cx = 9
div  cx                                 ; ax = ax / cx

mov [actualNumber],ax
ret
farenTOcent    ENDP

end            main
```

Screenshots:

Celsius to Fahrenheit

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 10
Change value to (C/F): F
Temperature is:    50
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 15
Change value to (C/F): F
Temperature is:    59
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 20
Change value to (C/F): F
Temperature is:    68
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 30
Change value to (C/F): F
Temperature is:    86
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 40
Change value to (C/F): F
Temperature is:   104
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 43
Change value to (C/F): F
Temperature is:   109
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 65
Change value to (C/F): F
Temperature is:   149
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 70
Change value to (C/F): F
Temperature is:   158
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 75
Change value to (C/F): F
Temperature is:   167
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 76
Change value to (C/F): F
Temperature is:   168
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 80
Change value to (C/F): F
Temperature is:   176
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 99
Change value to (C/F): F
Temperature is:   210
```

Fahrenheit to Celsius

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 158
Change value to (C/F): C
Temperature is:    70
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 130
Change value to (C/F): C
Temperature is:    54
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 110
Change value to (C/F): C
Temperature is:    43
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 104
Change value to (C/F): C
Temperature is:    40
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 95
Change value to (C/F): C
Temperature is:    35
```

```
Select C:\Users\plays\Desktop...
Enter temperature value: 90
Change value to (C/F): C
Temperature is:    32
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 84
Change value to (C/F): C
Temperature is:    28
```

```
C:\Users\plays\Desktop\Year 1...
Enter temperature value: 73
Change value to (C/F): C
Temperature is:    22
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 60
Change value to (C/F): C
Temperature is:    15
```

```
C:\Users\plays\Desktop\Year 1 ...
Enter temperature value: 50
Change value to (C/F): C
Temperature is:    10
```

Invalid Entries

```
Enter temperature value: 50
Change value to (C/F): a
Temperature is:    50
```

```
Enter temperature value: 50
Change value to (C/F): RA
Temperature is:    50
```

```
Enter temperature value: 50
Change value to (C/F): c
Temperature is:    50
```

```
Enter temperature value: 50
Change value to (C/F): f
Temperature is:    50
```