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Class: SE(B)

Batch – B3

Assignment No. 3

Problem Statement: Write x86/64 to convert 4-digit Hex no. into is equivalent BCD no. and 5-digit BCD no. into its equivalent HEX no. Make your program user friendly to accept the choice from user.

**Code**

section .data

menumsg db 10,10,'\*\* Menu for Code Conversion \*\*'

db 10,'1: Hex to BCD'

db 10,'2: BCD to Hex'

db 10,'3: Exit',10

db 10,10,'Please Enter Your Choice : '

menumsg\_len equ $-menumsg

hexinmsg db 10,10,'Please enter 4 digit Hex number :'

hexinmsg\_len equ $-hexinmsg

bcdopmsg db 10,10,'BCD Equivalent number is :'

bcdopmsg\_len equ $-bcdopmsg

bcdinmsg db 10,10,'Please enter 5 digit BCD number :'

bcdinmsg\_len equ $-bcdinmsg

hexopmsg db 10,10,'Hex Equivalent number is :'

hexopmsg\_len equ $-hexopmsg

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

section .bss

numascii resb 06 ; common buffer for choice, hex and bcd input

opbuff resb 05

dispbuff resb 08

%macro display 2

mov rax,01

mov rdi,01

mov rsi,%1

mov rdx,%2

syscall

%endmacro

%macro accept 2

mov rax,00

mov rdi,00

mov rsi,%1

mov rdx,%2

syscall

%endmacro

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

section .text

global \_start

\_start:

display menumsg,menumsg\_len

accept numascii,2

cmp byte [numascii],'1'

jne case2

call hex2bcd\_proc

jmp \_start

case2:

cmp byte [numascii],'2'

jne case3

call bcd2hex\_proc

jmp \_start

case3:

cmp byte [numascii],'3'

je exit

jmp \_start

exit:

mov rax,60

mov rbx,0

syscall

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

hex2bcd\_proc:

display hexinmsg,hexinmsg\_len

accept numascii,5

call packnum

mov ax,bx

mov rcx,0

mov bx,10

h2bup1:

mov dx,0

div bx

push rdx

inc rcx

cmp ax,0

jne h2bup1

mov rdi,opbuff

h2bup2:

pop rdx

add dl,30h

mov [rdi],dl

inc rdi

loop h2bup2

display bcdopmsg,bcdopmsg\_len

display opbuff,5

ret

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

bcd2hex\_proc:

display bcdinmsg,bcdinmsg\_len

accept numascii,6

display hexopmsg,hexopmsg\_len

mov rsi,numascii

mov rcx,05

mov rax,0

mov ebx,0Ah

b2hup1:

mov rdx,0

mul ebx

mov dl,[rsi]

sub dl,30h

add rax,rdx

inc rsi

loop b2hup1

mov ebx,eax

call disp32\_num

ret

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

packnum:

mov bx,00

mov ecx,04

mov esi,numascii

UP1: rol bx,04

mov al,[esi]

cmp al,39h

jbe skip2

sub al,07h

skip2:

sub al,30h

add bl,al

inc esi

loop UP1

ret

;\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

disp32\_num:

mov rdi,dispbuff ; point esi to buffer

mov rcx,08 ; load number of digits to display

dispup1:

rol ebx,4

mov dl,bl

and dl,0fH

add dl,30H

cmp dl,39H

jbe dispskip1

add dl,07H

dispskip1:

mov [rdi],dl

inc rdi

loop dispup1

display dispbuff+3,5

ret

**OUTPUT:**-

[HL@proj9-PC ~]$ nasm -f elf64 assg3.asm

[HL@proj9-PC ~]$ ld -o assg3 assg3.o

[HL@proj9-PC ~]$ ./assg3

\*\* Menu for Code Conversion \*\*

1: Hex to BCD

2: BCD to Hex

3: Exit

Please Enter Your Choice : 1

Please enter 4 digit Hex number :000A

BCD Equivalent number is :10

\*\* Menu for Code Conversion \*\*

1: Hex to BCD

2: BCD to Hex

3: Exit

Please Enter Your Choice : 2

Please enter 5 digit BCD number :00015

Hex Equivalent number is :0000F

\*\* Menu for Code Conversion \*\*

1: Hex to BCD

2: BCD to Hex

3: Exit

Please Enter Your Choice : 2

Please enter 5 digit BCD number :00014

Hex Equivalent number is :0000E

\*\* Menu for Code Conversion \*\*

1: Hex to BCD

2: BCD to Hex

3: Exit

Please Enter Your Choice : 2

Please enter 5 digit BCD number :00010

Hex Equivalent number is :0000A

\*\* Menu for Code Conversion \*\*

1: Hex to BCD

2: BCD to Hex

3: Exit

3