

**ComputerOrganization&AL**

(Lab)

**Task4**

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# Q1:Writeassemblycodetotakeuserinputfromrangeof 0 to 9. Your code check if the number is even or odd. If itseven,themessage“thegivennumberiseven”willbe displayed and in case of odd “the given number is odd” will be displayed.

## .MODELSMALL

.STACK100h

## .DATA

input\_promptdb'Enteranumberbetween1and9:$' even\_msg db 'The number is even.$'

odd\_msgdb'Thenumberisodd.$'

error\_msgdb'Invalidinput.Pleaseenteranumberbetween1and9.$'

## .CODE MAINPROC

movax,@DATA mov DS, AX

;Displaymessageaskingforinput mov AH, 09h

LEADX,input\_prompt int 21h

;Readacharacterfromuser mov AH, 01h

int 21h SUBAL,'0'

;Checkifinputiswithinvalidrange(1to9) CMP AL, 1

JL invalid\_input ;Iflessthan1,jumptoinvalidinput CMP AL, 9

JGinvalid\_input ;Ifgreaterthan9,jumptoinvalidinput

; Check if the number is even or oddmov AH, 0 ;ClearAHfordivision

mov BL, 2 ;Wewilldividethenumberby2 DIV BL

CMPAH,0 ;Checkifremainderis0

JE even\_number ;Ifremainderis0,it'seven JMP odd\_number ; If not, it's odd

even\_number:

;Display"Thenumberiseven" mov AH, 09h

LEADX,even\_msg int 21h

JMPend\_program

odd\_number:

;Display"Thenumberisodd" mov AH, 09h

LEADX,odd\_msg int 21h

JMPend\_program

invalid\_input:

;Displayerrormessage mov AH, 09h

LEADX,error\_msg int 21h

end\_program:

;Exitprogram

movAH,4Ch int 21h

MAINENDP END MAIN

# Q2: Write assembly code to display the numbers in the following pattern. Use nested loop. You can initialize value by yourself or take starting number as user input 1234

**5678**

## .MODELSMALL

.STACK100h

## .DATA

newlinedb0Dh,0Ah,'$'

## .CODE MAINPROC

movax,@DATA mov ds, ax

;Initializestartingnumber

movcx,1 ;Startwithnumber1

outer\_loop:

;Innerlooptoprint4numbersinarow mov bx, 4 ; 4 numbers per row

inner\_loop:

;ConvertthenumberinCXtoASCII

mov ax, cx ;MovecurrentnumberintoAX add al, '0'

;Printthenumber mov ah, 02h

movdl,al int 21h

;Incrementthenumber inc cx

;Decrementtheinnerloopcounter dec bx

jnzinner\_loop ;Repeatuntil4numbersareprinted

;Printnewline mov ah, 09h leadx,newline int 21h

;Decrementouterloopcounter cmp cx, 9

jlouter\_loop

;Exitprogram mov ah, 4Ch int 21h

MAINENDP END MAIN

# Q3:Initializeanarrayofcharactersfromatoh.Thenuse conditional statement to find the character in array. If it exists display message the character is found else the character is not found.

## .MODELSMALL

.STACK100h

## .DATA

char\_array db 'abcdefgh$' ;Arrayofcharactersfromatoh input\_prompt db 'Enter a character to search: $'

found\_msg db 'Character found.$' not\_found\_msgdb'Characternotfound.$' newline db 0Dh, 0Ah, '$'

## .CODE MAINPROC

movax,@DATA mov ds, ax

;Displaythemessageaskingforinput mov ah, 09h

leadx,input\_prompt int 21h

;Readasinglecharacterfromtheuser mov ah, 01h

int21h

movbl, al ;Storetheinputcharacterin BL

leasi,char\_array

movcx,8 ;Arraylengthis8 characters

search\_loop:

mov al, [si] ;Loadthecurrentcharacterfromthearray cmp al, bl ; Compare it with the user input

jefound ;Ifequal,jumptofoundlabel

;Movetothenextcharacterinthearray inc si

loopsearch\_loop ;Repeatuntilallcharactersarechecked

not\_found:

;Display"Characternotfound"message mov ah, 09h

leadx,not\_found\_msg int 21h

jmpend\_program ;Exitprogram

found:

;Display"Characterfound"message mov ah, 09h

leadx,found\_msg int 21h

end\_program:

;Newlineforoutputformatting mov ah, 09h

leadx,newline int 21h

;Exitprogram mov ah, 4Ch int 21h

MAINENDP END MAIN

# Q4: Write assembly code to display the following pattern. Use nested loop.

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## .MODELSMALL

.STACK100h

## .DATA

stardb'\*'

newlinedb0Dh,0Ah,'$';Newlinecharacters

## .CODE MAINPROC

movax,@DATA mov ds, ax

;Outerloopfor rows

movcx,1 ;Startfrom1star

outer\_loop:

; Inner loop to print stars in each row mov bx, cx ;CopyrownumbertoBX

inner\_loop:

;Displaythestarcharacter mov ah, 02h

movdl,star int 21h

;DecrementBX dec bx

jnzinner\_loop ;IfBXisnotzero,printanotherstar

;Printnewlineafterfinishingarow mov ah, 09h

leadx,newline

int21h ;Printnew line

;IncrementCXforthenextrow

inc cx cmpcx,6

jlouter\_loop ;Jumpbacktoouter\_loopifCXislessthan6

;

Exitprogram mov ah, 4Ch int 21h

MAINENDP END MAIN