Experiment No. 7: BCD Addition and Subtraction

Date: 05-10-2020

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A. AIM:

Program for performing addition of two 8-bit BCD numbers.

ALGORITHM:

- Initialize the data segment
- Move data segment address to ds
- Load opr1 to al and opr2 to bl
- Load 00h to cl register for carry
- Add al and bl
- Execute daa instruction to adjust the result of the addition of two packed BCD values to create a packed BCD result
- If there is no carry being generated, goto here segment else, increment cl by 1
- In here segment,
    - Load al to result
    - Load cl to carry
    - Terminate the program

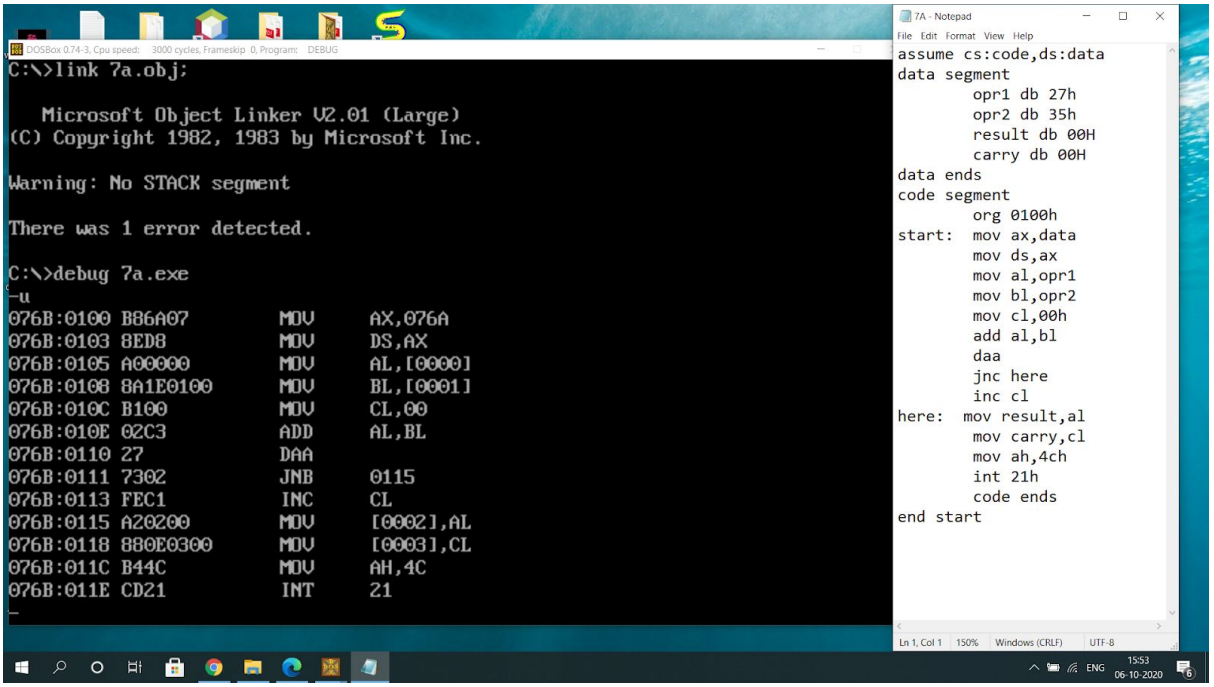
PROGRAM:

PROGRAM	COMMENTS

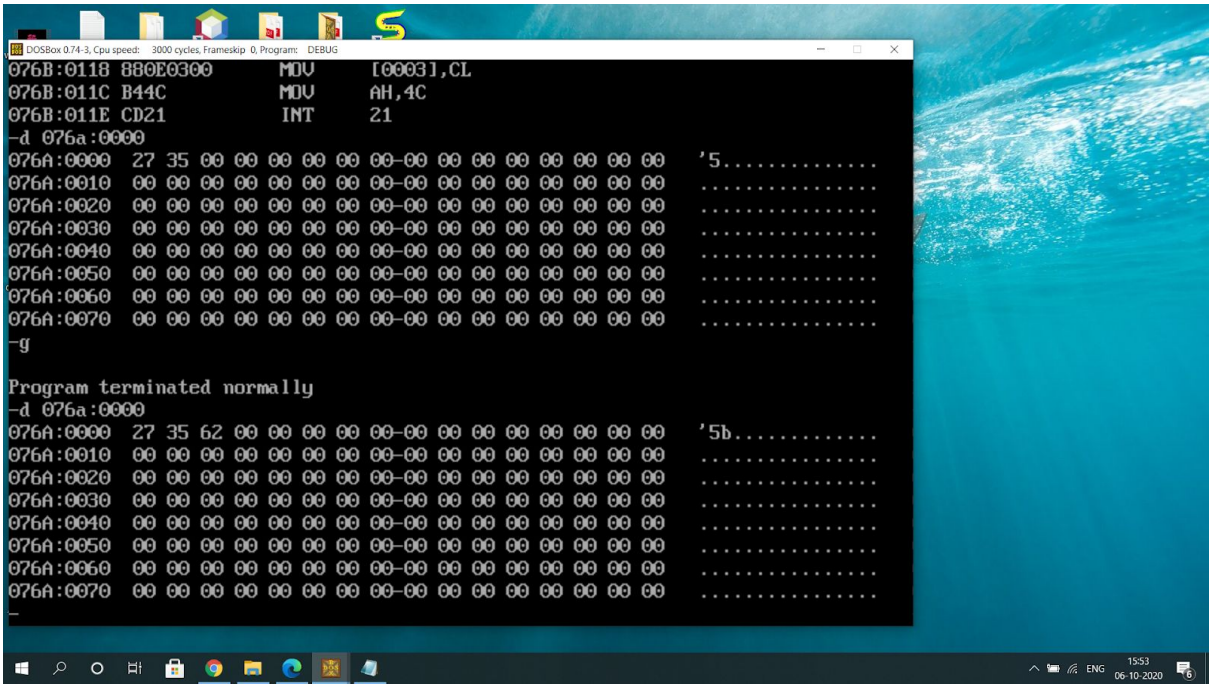
Start:
mov ax,data
mov ds,ax
mov al,opr1
mov bl,opr2
mov cl,00h
add al,bl
daa
jnc here
inc cl
	
	Transferring address of data segment to ds
	
	Value of opr1 is loaded to al
	Value of opr2 is loaded to bl
	Initializing the value of cl with 00h
	al=al+bl
	Add numbers represented in 8-bit packed BCD code
	Jump to “here” segment if no carry is generated
	Increments cl by 1

Here:
mov result,al
mov carry,cl
mov ah,4ch
int 21h
	
	Load register value of al to result
	Load cl value to carry
	Terminate the program

UNASSEMBLED CODE:



SAMPLE INPUT/OUTPUT:



RESULT:

Thus addition of two BCD numbers has been performed.

B. AIM:

Program for performing subtraction of two 8-bit BCD numbers.

ALGORITHM:

- Initialize the data segment
- Move data segment address to ds
- Load opr1 to al and opr2 to bl
- Load 00h to cl register
- Subtract al and bl
- Execute das instruction to adjust the result of the subtraction of two packed BCD values to create a packed BCD result
- If al is greater than bl, goto here segment else, increment cl by 1 and find the 10's complement of result and decimal adjust it.
- In here segment,
    - Load dl to result
    - Load cl to carry
    - Terminate the program

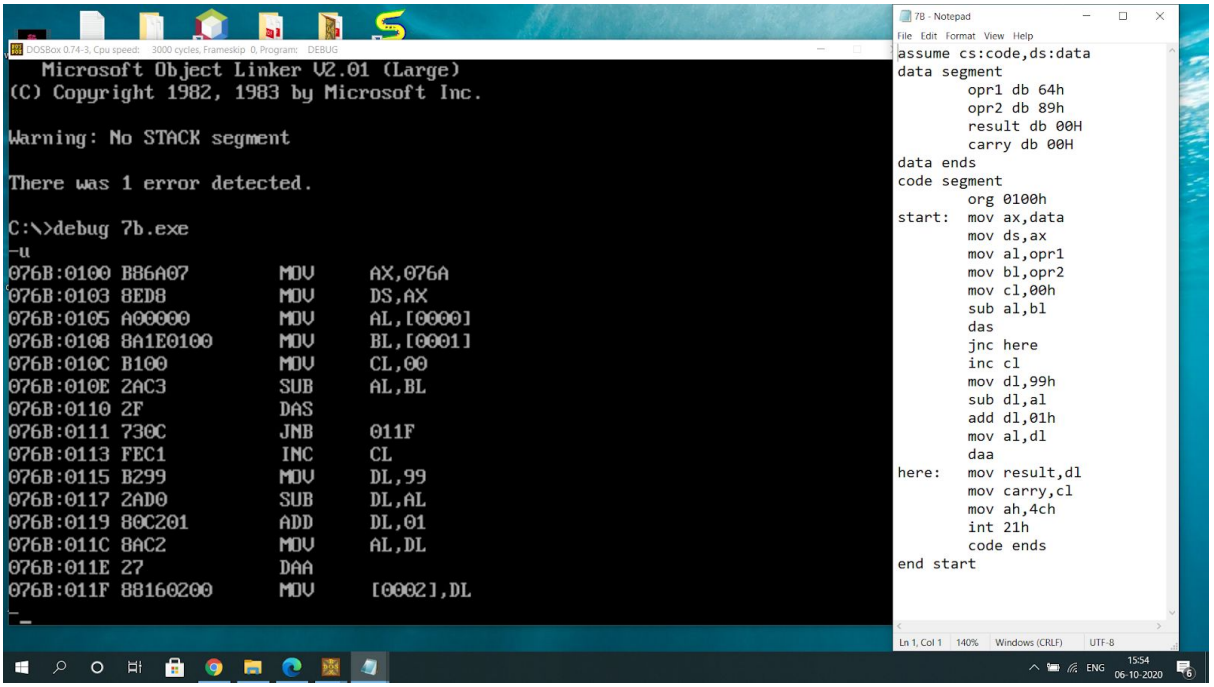
PROGRAM:

PROGRAM	**COMMENTS**

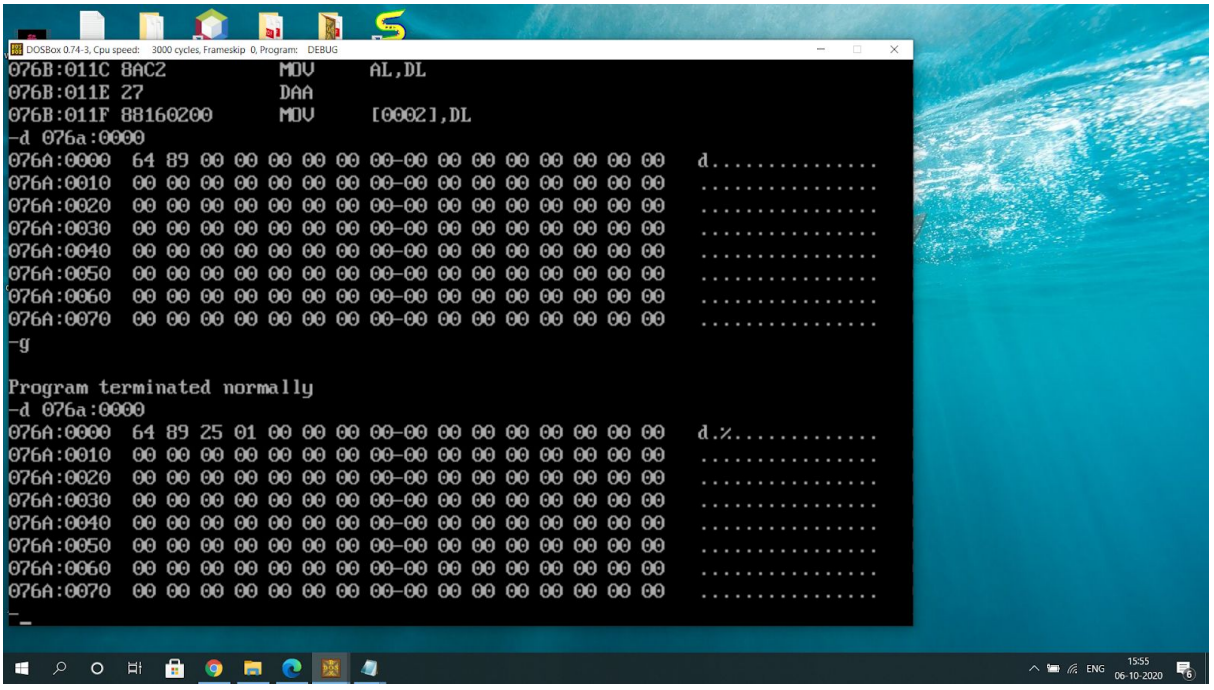
mov ax,data
mov ds,ax
mov al,opr1
mov bl,opr2
mov cl,00h
sub al,bl
das
jnc here
inc cl
mov dl,99h
sub dl,al
add dl,01h
mov al,dl
daa
	Load data segment to ds
	
	Value of opr1 is loaded to al
	Value of opr2 is loaded to bl
	Initializing the value of cl with 00h
	al=al-bl
	Subtract numbers represented in 8-bit packed BCD code
	Jump to "here" segment if al>bl
	Increment value of cl
	Load dl with 99h
	dl=dl-al
	dl=dl+01h
	Load al with value of dl
	Add numbers represented in 8-bit packed BCD code

here:
mov result,dl
mov carry,cl
mov ah,4ch
int 21h
	
	Load register value of dl to result
	Load cl value to carry
	Terminate the program

UNASSEMBLED CODE:



SAMPLE INPUT/OUTPUT



RESULT:

Thus subtraction of two BCD numbers has been performed.