Microprocessor

PRACTICAL 2

SUBMITTED BY:

ABHISHEK SAHU
18012

SUBMITTED TO:

Mr Mahesh Bhandari
Department of Computer Science

INDEX

S No.	Objective	Date	Sign
1	**Write a program for 32 bit BCD Addition and Subtraction.**	**19/11/2023**	

PRACTICAL-2

Q2. **Write a program for 32 bit BCD Addition and Subtraction.**

Addition Code:

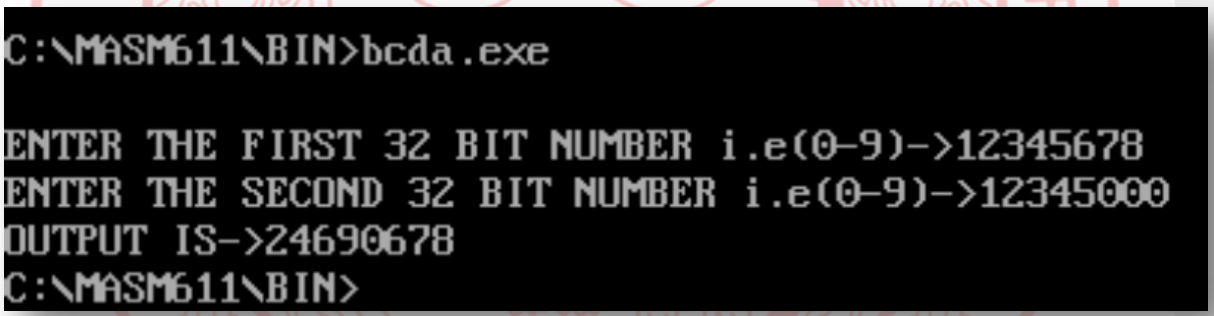
```
.MODEL SMALL
.STACK
.386
.DATA
AD DD ?
AD1 DD ?
MSG DB 13,10,"ENTER THE FIRST 32 BIT NUMBER I.E(0-9)->$"
MSG1 DB 13,10,"ENTER THE SECOND 32 BIT NUMBER I.E(0-9)->$"
MSG2 DB 13,10,"OUTPUT IS->$"
.CODE
.STARTUP

;;INPUT OF 32 BIT NO

MOV DX,OFFSET MSG
MOV AH,09
INT 21H
MOV EBX,0
MOV CX,4
ABC: SHL EBX,8

;1ST DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
SHL AL,4
MOV BL,AL
```

```
;2ND  DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
ADD BL,AL
LOOP ABC
MOV AD,EBX

;;INPUT OF  SECOND 32 BIT NO.

MOV DX,OFFSET MSG1
MOV AH,09
INT 21H
MOV EBX,0
MOV CX,4
ABC1: SHL EBX,8

;1ST DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
SHL AL,4
MOV BL,AL

;2ND  DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
ADD BL,AL
LOOP ABC1
MOV AD1,EBX

;;ADDITION

MOV DX,OFFSET MSG2
MOV AH,09
INT 21H
```

```
CLC
MOV EAX,AD
ADD AL,BL
DAA
MOV DL,AL
MOV AL,AH
ADC AL,BH
DAA
MOV DH,AL
MOV CX,DX
MOV DX,0000H
JNC ABM
MOV DL,01H
ABM:
ROL EBX,16
ROL EAX,16
ADC AL,DL
MOV DX,CX
ADC AL,BL
DAA
MOV CL,AL
MOV AL,AH
ADC AL,BH
DAA
MOV CH,AL
SHL ECX,16
ADD ECX,EDX
MOV EBX,ECX

;; PRINTING

MOV CX,4
ABC3 :ROL EBX,8
MOV AL,BL
AND AL,0F0H
SHR AL,4
ADD AL,30H
CMP AL,39H
JBE AB5
ADD AL,07H
AB5:
```

```
MOV DL,AL
MOV AH,02
INT 21H
MOV AL,BL
AND AL,00FH
ADD AL,30H
CMP AL,39H
JBE AB6

ADD AL,07H
AB6:
MOV DL,AL
MOV AH,02
INT 21H
LOOP ABC3
.EXIT
END
```

OUTPUT:



Subtraction Code:

```
.MODEL SMALL
.STACK
.386
.DATA
AD DD ?
AD1 DD ?
MSG DB 13,10,"ENTER THE FIRST 32 BIT NUMBER I.E(0-9)->$"
MSG1 DB 13,10,"ENTER THE SECOND 32 BIT NUMBER I.E(0-9)->$"
MSG2 DB 13,10,"OUTPUT IS->$"
.CODE
.STARTUP

;;INPUT OF 32 BIT NO.

MOV DX,OFFSET MSG
MOV AH,09
INT 21H
MOV EBX,0
MOV CX,4
ABC: SHL EBX,8

;1ST DIGIT OF FIRST NO.

MOV AH,01
INT 21H

AND AL,00FH
SHL AL,4
MOV BL,AL

;2ND  DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
ADD BL,AL
LOOP ABC
MOV AD,EBX

;;INPUT OF  SECOND 32 BIT NO.
```

```
MOV DX,OFFSET MSG1
MOV AH,09
INT 21H
MOV EBX,0
MOV CX,4
ABC1: SHL EBX,8

;1ST DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
SHL AL,4
MOV BL,AL

;2ND  DIGIT OF FIRST NO.

MOV AH,01
INT 21H
AND AL,00FH
ADD BL,AL
LOOP ABC1
MOV AD1,EBX

;;SUBTRACTION

MOV DX,OFFSET MSG2
MOV AH,09
INT 21H
CMP AD,EBX
JAE RESULT
MOV ECX,AD
MOV AD,EBX
MOV EBX,ECX
MOV DL,'-'
MOV AH,02
INT 21H
MOV AD1,EBX
RESULT:
CLC
MOV EAX,AD
```

```
SUB AL,BL
DAS
MOV DL,AL
MOV AL,AH
SBB AL,BH
DAS
MOV DH,AL
MOV CX,DX
MOV DX,0000H
JNC ABM
MOV DL,01H
ABM:
ROL EBX,16
ROL EAX,16
SUB AL,DL
MOV DX,CX
SUB AL,BL
DAS
MOV CL,AL
MOV AL,AH
SBB AL,BH
DAS
MOV CH,AL
SHL ECX,16
ADD ECX,EDX
MOV EBX,ECX

;; PRINTING

MOV CX,4
ABC3 :ROL EBX,8
MOV AL,BL
AND AL,0F0H
SHR AL,4
ADD AL,30H

CMP AL,39H
JBE AB5
ADD AL,07H
AB5:
MOV DL,AL
```

```
MOV AH,02
INT 21H
MOV AL,BL
AND AL,00FH
ADD AL,30H
CMP AL,39H
JBE AB6
ADD AL,07H
AB6:
MOV DL,AL
MOV AH,02
INT 21H
LOOP ABC3
.EXIT
END
```

OUTPUT: