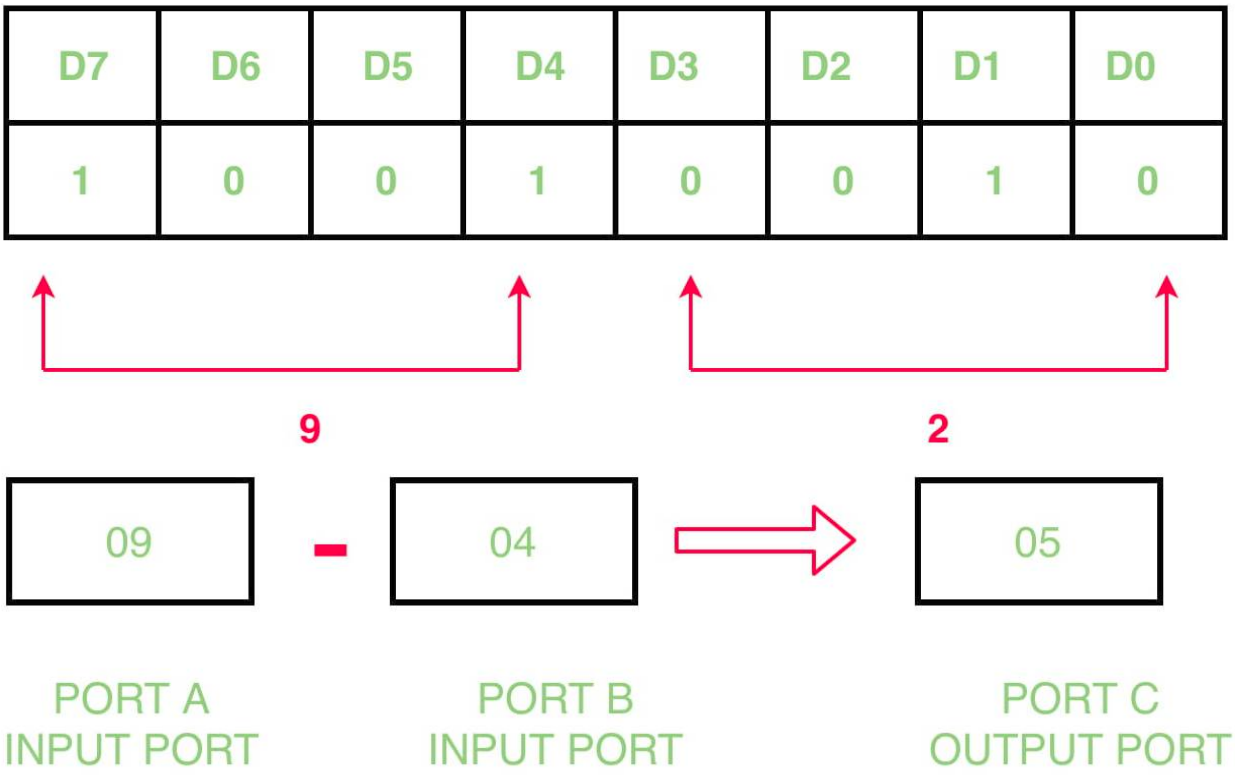
Problem – Write an assembly program which determine the subtraction of contents of port B from port A and store the result in port C by interfacing 8255 with 8085 microprocessor.

Example –



Algorithm –

1. Construct the control word register
2. Input the data from port A and port B
3. Subtract the contents of port A and port B
4. Display the result in port C
5. Halt the program

Program –

MNEMONICS	COMMENTS
MVI A, 92	A <- 92
OUT 83	Control Register <- A

IN 81	A <- Port B
MOV B, A	B <- A
IN 80	A <- Port A
SUB B	A <- A – B
OUT 82	Port C <- A
RET	Return

Explanation –

MVI A, 92: means that the value of control register is 92.
D7=1 I/O mode
D6=0 & D5=0 Port A is in mode 0
D4=1 Port A is taking input
D3=0 & D0=0 Port C is not taking part
D2=0 Port B is in mode 0
D1=1 Port B is taking input
OUT 83: putting the value of A in 83H which is the port number of port control register.
IN 81: take input from 81H which is the port number of port B.
MOV B, A: copies the content of A register to B register.
IN 80: taking input from 80H which is the port number of port A.
SUB B: subtract the contents of A register and B register.
OUT 82: display the result in 81H which is the port number of port C.
RET: return

Problem: 2

Problem: Write a 8086 program to Print a 16 bit Decimal number.

Examples:

Input: d1 = 655
Output: 655

Input: d1 = 234
Output:234

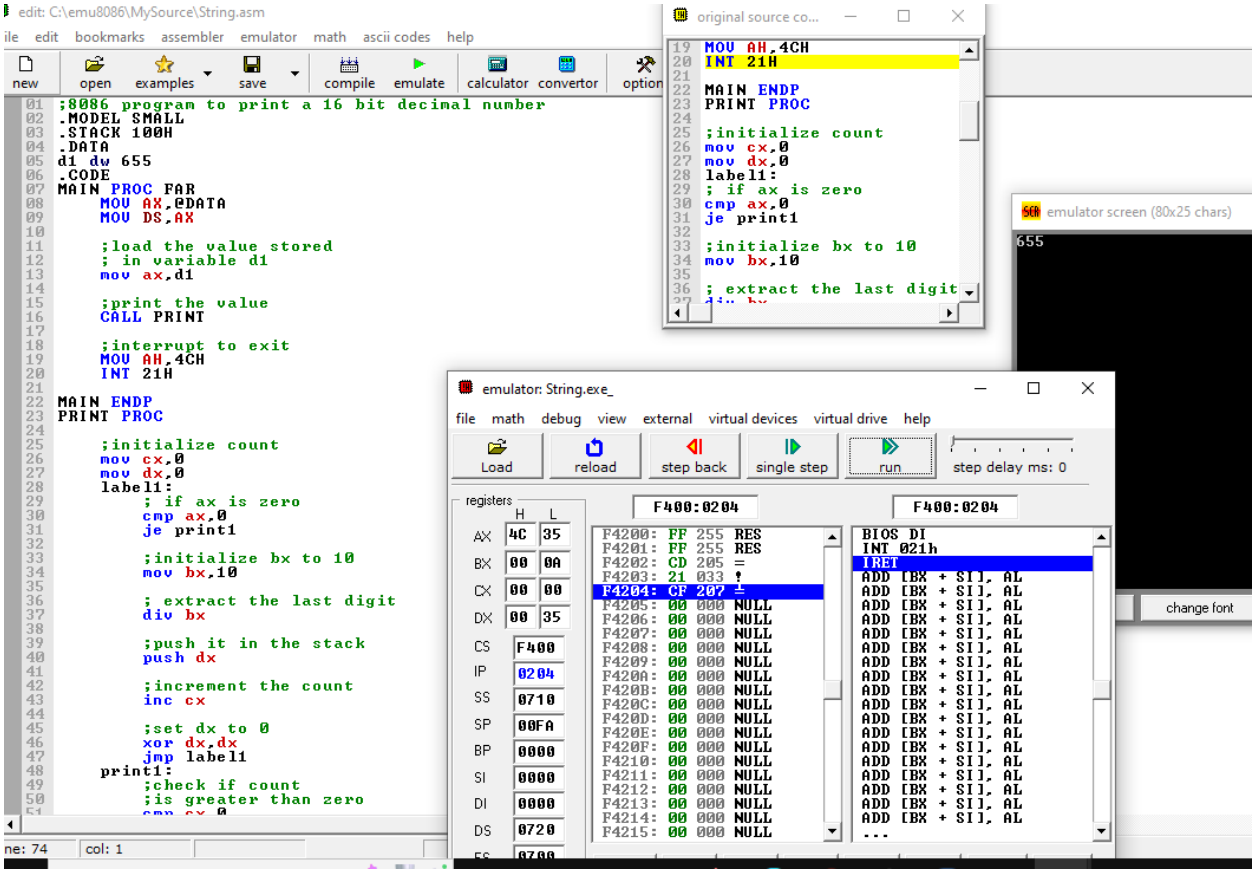
Explanation:

1. load the value stored into register
2. divide the value by 10
3. push the remainder into the stack
4. increase the count
5. repeat the steps until the value of the register is greater than 0
6. until the count is greater than zero
7. pop the stack
8. add 48 to the top element to convert it into ASCII
9. print the character using interrupt
10. decrements the count

Code:

```
;8086 program to print a 16 bit decimal number
.MODEL SMALL
.STACK 100H
.DATA
d1 dw 655
.CODE
MAIN PROC FAR
        MOV AX,@DATA
        MOV DS,AX

        ;load the value stored
        ; in variable d1
        mov ax,d1

        ;print the value
        CALL PRINT

        ;interrupt to exit
        MOV AH,4CH
        INT 21H

MAIN ENDP
PRINT PROC

        ;initialize count
        mov cx,0
        mov dx,0
        label1:
                ; if ax is zero
                cmp ax,0
                je print1
```

```
                ;initialize bx to 10
                mov bx,10

                ; extract the last digit
                div bx

                ;push it in the stack
                push dx

                ;increment the count
                inc cx

                ;set dx to 0
                xor dx,dx
                jmp label1
        print1:
                ;check if count
                ;is greater than zero
                cmp cx,0
                je exit

                ;pop the top of stack
                pop dx

                ;add 48 so that it
                ;represents the ASCII
                ;value of digits
                add dx,48

                ;interrupt to print a
                ;character
                mov ah,02h
                int 21h

                ;decrease the count
                dec cx
                jmp print1
exit:
ret
PRINT ENDP
END MAIN
```


edit: C:\emu8086\MySource\String.asm
file edit bookmarks assembler emulator math ascii codes help
new open examples save compile emulate calculator convertor option
;8086 program to print a 16 bit decimal number
.MODEL SMALL
.STACK 100H
.DATA
d1 dw 655
.CODE
MAIN PROC FAR
MOV AX,@DATA
MOV DS,AX
;load the value stored
; in variable d1
mov ax,d1
;print the value
CALL PRINT
;interrupt to exit
MOV AH,4CH
INT 21H
MAIN ENDP
PRINT PROC
;initialize count
mov cx,0
mov dx,0
label1:
; if ax is zero
cmp ax,0
je print1
;initialize bx to 10
mov bx,10
; extract the last digit
div bx
;push it in the stack
push dx
;increment the count
inc cx
;set dx to 0
xor dx,dx
jmp label1
print1:
;check if count
;is greater than zero
ne: 74
col: 1
original source co...
MOV AH,4CH
INT 21H
MAIN ENDP
PRINT PROC
;initialize count
mov cx,0
mov dx,0
label1:
; if ax is zero
cmp ax,0
je print1
;initialize bx to 10
mov bx,10
; extract the last digit
emulator screen (80x25 chars)
655
change font
emulator: String.exe_
file math debug view external virtual devices virtual drive help
Load reload step back single step run step delay ms: 0
registers
H L
AX 4C 35
BX 00 0A
CX 00 00
DX 00 35
CS F400
IP 0204
SS 0710
SP 00FA
BP 0000
SI 0000
DI 0000
DS 0720
F400:0204
F4200: FF 255 RES
F4201: FF 255 RES
F4202: CD 205 =
F4203: 21 033 !
F4204: CF 207 ±
F4205: 00 000 NULL
F4206: 00 000 NULL
F4207: 00 000 NULL
F4208: 00 000 NULL
F4209: 00 000 NULL
F420A: 00 000 NULL
F420B: 00 000 NULL
F420C: 00 000 NULL
F420D: 00 000 NULL
F420E: 00 000 NULL
F420F: 00 000 NULL
F4210: 00 000 NULL
F4211: 00 000 NULL
F4212: 00 000 NULL
F4213: 00 000 NULL
F4214: 00 000 NULL
F4215: 00 000 NULL
F400:0204
BIOS DI
INT 021h
IRET
ADD [BX + SI], AL
...