

Ahsanullah University of Science & Technology  
Department of Computer Science & Engineering

Course No : CSE 2214

Course Title : Assembly Language Programming Sessional

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Section : C

### Question no:1

Write a program to find the greatest common divisor of two integers  $M$  &  $N$ , according to the following algorithm

1.1 Divide  $M$  by  $N$ , getting quotient  $Q$  and remainder  $R$

1.2 if  $R = 0$  then stop,  $N$  is the GCD

1.3. if  $R < > 0$  then replace  $M$  by  $N$ ,  $N$  by  $R$  and Repeat step 1

### Answer:

.MODEL SMALL

.STACK 100H

.DATA

M1 DB 'ENTER M \$'

M2 DB 0DH, 0AH, 'ENTER N \$'

M3 DB 0DH, 0AH, 'GCD is = \$'

.CODE

MAIN PROC

MOV AX, @DATA

MOV DS, AX

LEA DX, M1

MOV AH, 9

INT 21H

CALL READ-NUMBER

PUSH AX

LEA DX, M2

MOV AH, 9

INT 21H

CALL READ\_NUMBER

MOV BX, AX

POP AX

REPEAT :

XOR DX, DX

DIV BX

CMP DX, 0

JE END\_LOOP

MOV AX, BX

MOV BX, DX

JMP REPEAT

END\_LOOP :

LEA DX, RESULT

MOV AH, 9

INT 21H

MOV AX, BX

CALL DISPLAY\_RESULT

MOV AH, 4CH

INT 21H

MAIN ENDP

READ\_NUMBER PROC

PUSH BX

PUSH CX

PUSH DX

JMP READ

SKIP\_BACKSPACE :

MOV AH, 2

MOV DL, 20H

INT 21H

READ :

XOR BX, BX

XOR CX, CX

XOR DX, DX

MOV AH, 1

INT 21H

CMP AL, "-"

JE @MINUS

CMP AL, "+"

JE @ PLUS

JMP SKIP\_INPUT

@ MINUS :

MOV CH,1

INC CL

JMP @INPUT

@ PLUS:

MOV CH,2

INC CL

@ INPUT:

MOV AH,1

INT 21H

SKIP\_INPUT:

CMP AL,0DH

JE @END\_INPUT

CMP AL,8H

JNE @NOT\_BACKSPACE

CMP CH,0

JNE @CHECK\_REMOVE\_MINUS  
MINVS

CMP CL,0

JE SKIP\_BACKSPACE

JMP @MOVE\_BACK

~~@ CHECK\_REMOVE\_MINUS:~~

@REMOVE\_PLUS\_MINUS:

MOV AH,2

MOV DL,20H

INT 21H

MOV DL,8H

INT 21H

JMP READ

@MOVE\_BACK:

MOV AX,BX

MOV BX,10

DIV BX

MOV BX,AX

MOV AH,2

MOV DL,20H

INT 21H

MOV DL,8H

INT 21H

XOR DX,DX

DEC CL

JMP @INPUT

@NOT-BACKSPACE :

INC CL

CMP AL, 30H

JL @ERROR

CMP AL, 39H

JG @ERROR

AND AX, 000FH

PUSH AX

MOV AX, 10

MUL BX

MOV BX, AX

POP AX

ADD BX, AX

JS @ERROR

JMP @INPUT

@ERROR:

MOV AH, 2

MOV DL, 7H

INT 21H

XOR CH, CH

@CLEAR:

MOV DL, 8H

INT 21H

MOV DL, 20H

INT 21H

MOV DL, 8H

INT 21H

LOOP @CLEAR

JMP READ

@END-INPUT:

CMP CH, 1

JNE @EXIT

NEG BX

@EXIT:

MOV AX, BX

POP DX

POP CX

POP BX

RET

READ\_NUMBER ENDP

DISPLAY\_RESULT PROC

PUSH BX

PUSH CX

PUSH DX

CMP AX,0

JGE @START

PUSH AX

MOV AH,2

MOV DL, "-"

INT 21H

POP AX

NEG AX

@START:

XOR CX,CX

MOV BX,10

@OUTPUT:

XOR DX,DX

DIV BX

PUSH DX

INC CX

OR AX,AX

JNE @OUTPUT

MOV AH,2

@DISPLAY:

POP DX

OR DL,30H

INT 21H

LOOP @DISPLAY

POP DX

POP CX

POP BX

RET

DISPLAY\_RESULT ENDP