



Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

Course No : CSE2214
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Section : A

Question No: 01

Write a program that prompts the user to enter a character, and in subsequent lines prints its ASCII code in binary and the number of 1 bits in its ASCII code.

Answer:

```
.MODEL SMALL  
.DATA  
M1 DB 'TYPE A CHARACTER : $'  
M2 DB 0AH,0DH,'THE ASCII CODE OF '  
C1 DB ?, ' IN BINARY IS : $'  
M3 DB 0AH,0DH,'THE NUMBER OF 1 BIT IS '  
C2 DB ?, '$'  
.CODE  
MAIN PROC  
    MOV AX,@DATA  
    MOV DS,AX  
  
    MOV AH,9  
    LEA DX,M1  
    INT 21H  
  
    MOV AH,1  
    INT 21H  
    MOV BL,AL  
    MOV C1,AL  
  
    MOV AH,9 ;display results  
    LEA DX,M2  
    INT 21H  
  
    MOV BH,0 ;counter for one's  
    MOV CX,8
```

MOV AH,2

L1:

SHL BL,1

JC L2

MOV DL,'0'

INT 21H

JMP L4

L2:

MOV DL,'1'

INT 21H

INC BH

L4:

LOOP L1

ADD BH,30H

MOV C2,BH

MOV AH,9

LEA DX,M3

INT 21H

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN

Question No: 02

Write a program that prompts the user to type a hex number of four hex digits or less, and outputs it in binary on the next line. If the user enters an illegal character, he or she should be prompted to begin again. Accept only uppercase letters. Your program may ignore any input beyond four characters.

Answer:

.MODEL SMALL

.DATA

M1 DB 0AH,0DH,'TYPE A HEXA NUMBER of 4 digit : ','\$'

M2 DB 0AH,0DH,'IN BINARY IT IS : ','\$'

M3 DB 0AH,0DH,'ILLEGAL HEXA DIGIT, TRY AGAIN : ','\$'

.CODE

MAIN PROC

MOV AX,@DATA

MOV DS,AX

MOV AH,9

LEA DX,M1

INT 21H

START:

XOR BX,BX

MOV CL,4

MOV AH,1

INT 21H

WHILE_:

**CMP AL,0DH
JE END_WHILE**

**CMP AL,'0' ;detect for error if less than 0
JL ERROR**

**CMP AL, '9'
JG LETTER
AND AL,0FH**

JMP SHIFT

**LETTER:
CMP AL,'F'
JG ERROR
CMP AL,'A'
JL ERROR
SUB AL,37H**

**SHIFT:
SHL BX,CL
OR BL,AL
INT 21H
JMP WHILE_**

END_WHILE:

**MOV AH,9
LEA DX,M2 ;display result
INT 21H
MOV CX,16**

MOV AH,2

SHOW:

SHL BX,1

JC ONE

MOV DL,'0'

INT 21H

JMP LOOP1

ONE:

MOV DL,'1'

INT 21H

LOOP1:

LOOP SHOW

JMP OUT_

ERROR:

MOV AH,9

LEA DX,M3

INT 21H

JMP START

OUT_:

MOV AH,4CH

INT 21H

**MAIN ENDP
END MAIN**

Question No: 03

Write a program that prompts the user to enter two unsigned hex numbers, 0 to FFFFh, and prints their sum in hex on the next line. If the user enters an illegal character, he or she should be prompted to begin again. Your program should be able to handle the possibility of unsigned overflow. Each input ends with a carriage return.

Answer:

.MODEL SMALL

.DATA

M1 DB 0AH,0DH,'TYPE A HEXA NUMBER 0 - FFFF :\$'

M2 DB 0AH,0DH,'THE SUM IN HEXA IS \$'

M3 DB 0AH,0DH,'ILLEGAL HEXA DIGIT, TRY AGAIN : ','\$'

COUNTER DB 4

NUM DW ?

.CODE

MAIN PROC

MOV AX,@DATA

MOV DS,AX

CALL READ

MOV NUM,BX

CALL READ

MOV AH,9
LEA DX,M2
INT 21H
ADD BX,NUM

JC SHOWCY
MOV AH,2
MOV DL,'0'
INT 21H
JMP NEXT

SHOWCY:
MOV AH,2
MOV DL,'1'
INT 21H

NEXT:
CALL SHOW
MOV AH,4CH
INT 21H

MAIN ENDP

READ PROC

READ_START:

MOV AH,9
LEA DX,M1
INT 21H

XOR BX,BX
MOV CL,4
MOV AH,1
INT 21H

WHILE_:

CMP AL,0DH
JE END_W

CMP AL,'0'
JL ERROR

CMP AL,'9'
JG LETTER

AND AL,0FH
JMP SHIFT

LETTER:

CMP AL,'F'
JG ERROR
CMP AL,'A'
JL ERROR

SUB AL,37H

SHIFT:
SHL BX,CL
OR BL,AL
INT 21H

JMP WHILE_

ERROR:

MOV AH,9

LEA DX,M3

INT 21H

JMP READ_START

END_W:

RET

READ ENDP

SHOW PROC

MOV CL,4

START:

MOV DL,BH

SHR DL,CL

CMP DL,9

JG LETTER1

ADD DL,30H

JMP SHOW1

LETTER1:

ADD DL,37H

SHOW1:

MOV AH,2

INT 21H

ROL BX,CL

DEC COUNTER

CMP COUNTER,0

JNE START

RET

SHOW ENDP

END MAIN

Question No: 04

Write a program that prompts the user to enter a string of decimal digits, ending with a carriage return, and prints their sum in hex on the next line. If the user enters an illegal character, he or she should be prompted to begin again.

Answer:

.MODEL SMALL

.DATA

M1 DB 0AH,'ENTER A DECIMAL DIGIT STRING :\$'

M2 DB 0AH,'THE SUM OF THE DIGIT IN HEX IS \$'

M3 DB 0AH,0DH,'ILLEGAL DIGIT, TRY AGAIN : ','\$'

COUNTER DB 4

.CODE

MAIN PROC

MOV AX,@DATA

MOV DS,AX

MOV AH,9

LEA DX,M1

INT 21H

READ_START:

XOR BX,BX

WHILE_:

MOV AH,1

INT 21H

CMP AL,0DH

JE END_W

CMP AL,'0'
JL ERROR
CMP AL, '9'
JG ERROR

AND AL,0FH
CBW

ADD BX,AX
JMP WHILE_

ERROR:

MOV AH,9
LEA DX,M3
INT 21H

JMP READ_START

END_W:

MOV AH,9
LEA DX,M2
INT 21H

MOV CL,4

START:
MOV DL,BH
SHR DL,CL

CMP DL,9

JG LETTER1

ADD DL,30H

JMP SHOW1

LETTER1:

ADD DL,37H

SHOW1:

MOV AH,2

INT 21H

ROL BX,CL

DEC COUNTER

CMP COUNTER,0

JNE START

MOV AH,4CH

INT 21H

MAIN ENDP

END MAIN