



q2.asm - assembly\_code - Visual Studio Code

EXPLORER

ASSEMBLY\_CODE

- week-2
  - function.asm
  - hello.asm
  - hello.o
  - q1
  - q1.asm
  - q1.o
  - q2
  - q2.asm
  - q2.o
  - q3.asm
  - q4.asm
  - q5.asm
  - q6.asm
  - q7.asm
  - q8.asm
  - q9.asm
  - q10.asm
  - q11.asm
- ics312\_datasize.pdf
- M2L1.pdf
- nasmdoc.pdf
- ProgrammingGround...

q2.asm

```
33  mov     eax,4      ;for new_line
34  mov     ebx,1
35  mov     ecx,n
36  mov     edx,1
37  int     0x80
38
39  mov     eax, 1     ;sys_exit
40  int     0x80      ;interrupt
41
42  section .data
43      x dw 200      ;operand 1
44      y dw 159      ;operand 2
45      z db '-'      ;'-' sybmol
46      n db '',0xA    ;new line
47      max dw 65535   ;max value for word
48      msg db 'The Difference is:'
49      len equ $-msg
50
51  section .bss
52      res resb 1     ;result variable
53
```

TERMINAL

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q2.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q2 q2.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q2
The Difference is:-1
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q2.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q2 q2.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q2.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q2 q2.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q2
The Difference is:41
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

Ln 47, Col 25 Spaces: 4 UTF-8 LF ARM Go Live

Type here to search

13:54 24-02-2021

Visual Studio Code interface showing assembly code for q3.asm.

**EXPLORER**

- ASSEMBLY\_CODE
  - week-2
    - function.asm
    - hello.asm
    - q1.asm
    - q2.asm
    - q3
    - q3.asm**
    - q3.o
    - q4.asm
    - q5.asm
    - q6.asm
    - q7.asm
    - q8.asm
    - q9.asm
    - q10.asm
    - q11.asm
  - ics312\_datasize.pdf
  - M2L1.pdf
  - nasmdoc.pdf
  - ProgrammingGround...

**q3.asm**

```
20  ;to preserve register values
21  call print_num ;number in eax register
22  popad          ;restore register values
23
24  mov eax,4       ;for new line
25  mov ebx,1
26  mov ecx,n
27  mov edx,1
28  int 0x80
29
30  mov     eax, 1    ;sys_exit
31  int     0x80      ;interrupt
32
33  section .data
34  x dd 675         ;operand 1
35  y dd 234         ;operand 2
36  n db '',0xA
37  z db '-'
38  msg db 'The Product is:'
39  len equ $-msg
40
41  section .bss
42  res resb 1        ;result variable
43
```

**TERMINAL**

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q2.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q2 q2.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q2.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q2 q2.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q2
The Difference is:41
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q3.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q3 q3.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q3
The Product is:157950
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

**STATUS BAR**

Ln 35, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

13:58 24-02-2021

Visual Studio Code interface showing the assembly file `q4.asm` and its execution output in the terminal.

**EXPLORER**

- WEEK-2
  - exec\_instructions.txt
  - function.asm
  - hello.asm
  - q1.asm
  - q2.asm
  - q3.asm
  - q4
  - q4.asm**
  - q4.o
  - q5.asm
  - q6.asm
  - q7.asm
  - q8.asm
  - q9.asm
  - q10.asm
  - q11.asm

**q4.asm**

```
47     mov     edx,1
48     int     0x80
49
50     mov     eax,1      ;sys_exit
51     int     0x80      ;interrupt
52
53     section .data
54     x dw 900          ;operand 1
55     y dw 400          ;operand 2
56     n db '',0xA
57     z db '-'
58     msg db 'The Quotient is:'
59     len equ $-msg
60     msg2 db 'The remainder is:'
61     len2 equ $-msg2
62
63     section .bss
64     res resb 1         ;result variable
65
```

**TERMINAL**

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q4.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q4 q4.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q4
The Quotient is:2
The remainder is:100
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

**STATUS BAR**

Ln 55, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

15:00 24-02-2021

File Edit Selection View Go Run Terminal Help

q5.asm - assembly\_code - Visual Studio Code

EXPLORER

ASSEMBLY\_CODE

week-2

function.asm

hello.asm

q1.asm

q2.asm

q3.asm

q4

q4.asm

q4.o

q5

q5.asm

q5.o

q6.asm

q7.asm

q8.asm

q9.asm

q10.asm

q11.asm

ics312\_datasize.pdf

M2L1.pdf

nasmdoc.pdf

ProgrammingGround...

q5.asm

week-2 > ASM q5.asm

32 mov eax, 3

33 int 0x80

34

35 mov eax, 4 ;new line

36 mov ebx, 1

37 mov ecx, n

38 mov edx, 1

39 int 0x80

40

41

42 mov eax, 1 ;sys\_exit

43 int 0x80 ;interrupt

44

45 section .data

46 num db '100' ;operand

47 msg db 'after increment:'

48 len equ \$-msg

49 n db '', 0xA

50

TERMINAL

PROBLEMS

OUTPUT

DEBUG CONSOLE

1: wsl

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$ ./q5

after increment:101

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$

OUTLINE

Ln 32, Col 10 Spaces: 4 UTF-8 LF ARM Go Live

14:14 24-02-2021



File Edit Selection View Go Run Terminal Help

q6.asm - assembly\_code - Visual Studio Code

EXPLORER

ASSEMBLY\_CODE

week-2

function.asm

hello.asm

q1.asm

q2.asm

q3.asm

q4

q4.asm

q4.o

q5

q5.asm

q5.o

q6

q6.asm

q6.o

q7.asm

q8.asm

q9.asm

q10.asm

q11.asm

ics312\_datasize.pdf

M2L1.pdf

nasmdoc.pdf

ProgrammingGround...

q6.asm

week-2 > q6.asm

27

28 mov [num+esi],al ;print num

29 mov eax,4

30 mov ebx,1

31 mov ecx,num

32 mov edx,3

33 int 0x80

34

35 mov eax,4 ;new line

36 mov ebx,1

37 mov ecx,n

38 mov edx,1

39 int 0x80

40

41 mov eax,1 ;sys\_exit

42 int 0x80 ;interrupt

43

44 section .data

45 num db '500'

46 msg db 'after decrement:'

47 len equ \$-msg

48 n db '',0xA

49

TERMINAL

PROBLEMS

OUTPUT

DEBUG CONSOLE

1: wsl

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$ nasm -f elf q6.asm

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$ ld -m elf\_i386 -s -o q6 q6.o

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$ ./q6

after decrement:499

manas@LAPTOP-U09MU8FI:/mnt/d/assembly\_code/week-2\$

OUTLINE

Ln 14, Col 10 Spaces: 4 UTF-8 LF ARM Go Live

14:16 24-02-2021

q7.asm - assembly\_code - Visual Studio Code

EXPLORER

ASSEMBLY\_CODE

week-2

- function.asm
- hello.asm
- q1.asm
- q2.asm
- q3.asm
- q4
- q4.asm
- q4.o
- q5
- q5.asm
- q5.o
- q6
- q6.asm
- q6.o
- q7
- q7.asm**
- q7.o
- q8.asm
- q9.asm
- q10.asm
- q11.asm

ics312\_datasize.pdf

M2L1.pdf

nasmdoc.pdf

ProgrammingGround...

q7.asm

```
17
18     pushad        ;to preserve register values
19     call print_num ;number in eax register
20     popad         ;restore register values
21
22     mov eax,4      ;for new line
23     mov ebx,1
24     mov ecx,n
25     mov edx,1
26     int 0x80
27
28     mov     eax, 1  ;sys_exit
29     int     0x80    ;interrupt
30
31     section .data
32     x dw 127        ;operand 1
33     y dw 300        ;operand 2
34     n db '',0xA
35     z db '-'
36     msg db 'The Result after Logical-And is:'
37     len equ $-msg
38
39     section .bss
40     res resb 1       ;result variable
41
```

TERMINAL

1: wsl

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q6.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q6 q6.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q6
after decrement:499
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q7.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q7.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q7 q7.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q7
The Result after Logical-And is:44
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

Ln 36, Col 30 Spaces: 4 UTF-8 CRLF ARM Go Live

14:18 24-02-2021

Visual Studio Code interface showing the assembly code editor and terminal.

**EXPLORER**

- ASSEMBLY\_CODE
  - week-2
    - function.asm
    - hello.asm
    - q1.asm
    - q2.asm
    - q3.asm
    - q4
    - q4.asm
    - q4.o
    - q5
    - q5.asm
    - q5.o
    - q6
    - q6.asm
    - q6.o
    - q7
    - q7.asm
    - q7.o
    - q8
    - q8.asm**
    - q8.o
    - q9.asm
    - q10.asm
    - q11.asm
  - ics312\_datasize.pdf
  - M2L1.pdf
  - nasmdoc.pdf
  - ProgrammingGround...

**q8.asm**

```
20  popad                ;restore register values
21
22  mov  eax,4            ;for new line
23  mov  ebx,1
24  mov  ecx,n
25  mov  edx,1
26  int  0x80
27
28  mov  eax, 1           ;sys_exit
29  int  0x80            ;interrupt
30
31  section .data
32  x dw 256              ;operand 1
33  y dw 128              ;operand 2
34  n db '',0xA
35  z db '-'
36  msg db 'The Result after Logical-Or is:'
37  len equ $-msg
38
39  section .bss
40  res resb 1            ;result variable
41
```

**TERMINAL**

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q7.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q7.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q7 q7.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q7
The Result after Logical-And is:44
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q8.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q8 q8.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q8
The Result after Logical-Or is:384
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

Ln 33, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

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14:19 24-02-2021



Visual Studio Code interface showing assembly code for q9.asm and a terminal window.

**EXPLORER**

- ASSEMBLY\_CODE
  - week-2
    - function.asm
    - hello.asm
    - q1.asm
    - q2.asm
    - q3.asm
    - q4
    - q4.asm
    - q4.o
    - q5
    - q5.asm
    - q5.o
    - q6
    - q6.asm
    - q6.o
    - q7
    - q7.asm
    - q7.o
    - q8
    - q8.asm
    - q8.o
    - q9
    - q9.asm**
    - q9.o
    - q10.asm
    - q11.asm
  - ics312\_datasize.pdf
  - M2L1.pdf
  - nasmdoc.pdf
  - ProgrammingGround...
- OUTLINE

**q9.asm**

```
20  popad                ;restore register values
21
22  mov eax,4            ;for new line
23  mov ebx,1
24  mov ecx,n
25  mov edx,1
26  int 0x80
27
28  mov     eax, 1        ;sys_exit
29  int     0x80          ;interrupt
30
31  section .data
32      x dw 640          ;operand 1
33      y dw 766          ;operand 2
34      n db '',0xA
35      z db '-'
36      msg db 'The Result after Logical-Xor is:'
37      len equ $-msg
38
39  section .bss
40  res resb 1            ;result variable
41
```

**TERMINAL**

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q8.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q8 q8.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q8
The Result after Logical-Or is:384
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q9.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q9 q9.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q9
The Result after Logical-Xor is:126
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

Ln 32, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

Type here to search

14:22 24-02-2021

q10.asm - assembly\_code - Visual Studio Code

EXPLORER

ASSEMBLY\_CODE

week-2

- function.asm
- hello.asm
- q1.asm
- q2.asm
- q3.asm
- q4
- q4.asm
- q4.o
- q5
- q5.asm
- q5.o
- q6
- q6.asm
- q6.o
- q7
- q7.asm
- q7.o
- q8
- q8.asm
- q8.o
- q9
- q9.asm
- q9.o
- q10
- q10.asm
- q10.o
- q11.asm

ics312\_datasize.pdf

M2L1.pdf

nasmdoc.pdf

ProgrammingGround

OUTLINE

q10.asm

```
21     mov     eax,4           ;for new line
22     mov     ebx,1
23     mov     ecx,n
24     mov     edx,1
25     int     0x80
26
27     mov     eax, 1         ;sys_exit
28     int     0x80         ;interrupt
29
30     section .data
31     x dw 128              ;operand 1
32     n db '',0xA
33     z db '-'
34     msg db 'The result after Left-shift by 3 is:'
35     len equ $-msg
36
37     section .bss
38     res     resb 1         ;result variable
39
```

TERMINAL

1: wsl

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q9 q9.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q9
The Result after Logical-Xor is:126
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q10.asm
nasm: fatal: unable to open input file `q10.ams'
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q10.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q10 q10.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q10
The result after Left-shift by 3 is:1024
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

Ln 31, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

Type here to search

14:23 24-02-2021

Visual Studio Code interface showing the assembly code file `q11.asm` in the `ASSEMBLY_CODE` workspace.

**EXPLORER**

- ASSEMBLY\_CODE
  - week-2
    - function.asm
    - hello.asm
    - q1.asm
    - q2.asm
    - q3.asm
    - q4
    - q4.asm
    - q4.o
    - q5
    - q5.asm
    - q5.o
    - q6
    - q6.asm
    - q6.o
    - q7
    - q7.asm
    - q7.o
    - q8
    - q8.asm
    - q8.o
    - q9
    - q9.asm
    - q9.o
    - q10
    - q10.asm
    - q10.o
    - q11
    - q11.asm
    - q11.o
  - ics312\_datasize.pdf

**q11.asm**

```
23  mov ecx, 11
24  mov edx, 1
25  int 0x80
26
27  mov     eax, 1    ;sys_exit
28  int     0x80     ;interrupt
29
30  section .data
31      x dw 513      ;operand 1
32      n db '',0xA
33      z db '-'
34      msg db 'The result after Right-shift by 2 is:'
35      len equ $-msg
36
37  section .bss
38      res resb 1     ;result variable
39
```

**TERMINAL**

```
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ nasm -f elf q11.asm
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ld -m elf_i386 -s -o q11 q11.o
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$ ./q11
The result after Right-shift by 2 is:128
manas@LAPTOP-U09MU8FI:/mnt/d/assembly_code/week-2$
```

**STATUS BAR**

Ln 15, Col 13 Spaces: 4 UTF-8 CRLF ARM Go Live

14:25 24-02-2021



## functions.asm

print-num:

push edx ; push in stack for correct order

mov edx, 0 ; set remainder to zero

cmp eax, 0 ; check if num is zero

je done

mov ebx, 10 ; divide by 10 to get remainder in edx

div ebx

call print-num

add eax, '0' ; convert to ascii digit

mov [res], edx

mov ecx, res ; print digit

mov edx, 1

mov eax, 4

mov ebx, 1

int 0x80

done:

pop edx ; pop value since it's no longer needed

ret



# LALAJI MEMORIAL OMEGA INTERNATIONAL SCHOOL

79, Omega School Road, Kolapakkam, Chennai - 600 128

SUB:

DATE:

PAGE:

% Question-4

Manas  
COE19B003

% include "functions.asm"

section .text

global \_start

\_start:

mov eax, 4 ; print message

mov ebx, 1

mov ecx, msg

mov edx, len

int 0x80

xor dx, dx

mov ax, [x]

mov bx, [y]

div bx ; divide

pushad

call print\_num ; print quotient

popad

pushad

mov eax, 4

mov ebx, 1

mov ecx, msg

mov edx, len

~~popad~~ popad

~~mov eax, dx~~

push

mov eax, 1

; exit

int 0x80

section .data

x dw 900

y dw 40

msg db 'Quotient:'

len equ \$ - msg

msg2 db 'remainder'

len2 equ \$ - msg2

section .bss

res resb 1

~~print~~ ; print message

mov ax, dx

pushad

call print\_num

popad

; print remainder



# LALAJI MEMORIAL OMEGA INTERNATIONAL SCHOOL

79, Omega School Road, Kolapakkam, Chennai - 600 128

SUB:

DATE:

PAGE:

Question - 9

Manas

COE19B003

```
% include "functions.asm"
```

```
Section .text
```

```
global _start
```

```
_start:
```

```
mov eax, 4 ; print message
```

```
mov ebx, 1
```

```
mov ecx, msg
```

```
mov edx, len
```

```
mov ax, [x]
```

```
mov bx, [y]
```

```
xor ax, bx ; perform xor
```

```
pushad
```

```
call print-num ; print number
```

```
popad
```

```
mov eax, 1 ; exit
```

```
int 0x80
```

```
Section .data
```

```
x dw 040
```

```
y dw 766
```

```
msg db 'logical - xor is '
```

```
len equ $-msg
```

```
Section .bss
```

```
res resb 1
```



## Question - 10

```
% include "functionf.asm"
section .text
global -start
-start
mov eax, 4 ; print msg
mov ebx, 1
mov ecx, msg
mov edx, len
int 0x80
mov ax, [x]
shl ax, 3 ; left shift by 3
pushad
call print_num ; print_num
popad
mov eax, 1 ; exit
int 0x80
```

```
section .data
x dw 128
msg db 'The result after lsh by 3'
len equ $-msg
```

```
section .bss
sum resb 1
```