

COAL

LAB09

23K2001

BCS-3J

Q1:

```
Lab09.asm  + X
TITLE My Nineth Lab Tasks (Lab09.asm)
INCLUDE Irvine32.inc
.data
    input BYTE "Enter a number: ", 0
    res BYTE "Product of inputted number with 25: ", 0
.code
main PROC
    mov eax, 0
    mov edx, offset input
    call writestring
    call readint
    mov ecx, eax
    shl eax, 4
    mov edx, ecx
    shl edx, 3
    add eax,edx
    add eax, ecx
    call crlf
    mov edx, offset res
    call writestring
    call writedec
    call crlf
    exit
main ENDP
END main
```

Microsoft Visual Studio Debug Console

Enter a number: 27

Product of inputted number with 25: 675

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09.exe (process 14520) exited normally.
Press any key to close this window . . .

Calculator

Standard

27 × 25 =

675

MC MR M+ M- MS Mv

% CE C <X>

```
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main PROC
    mov eax, 0
    mov edx, offset input
    call writestring
    call readint
    mov ecx, eax
    shl eax, 4
    mov edx, ecx
    shl edx, 3
    add eax,edx
    add eax, ecx
    call crlf
    mov edx, offset res
    call writestring
    call writedec
    call crlf
    exit
main ENDP
END main
```

Microsoft Visual Studio Debug Console

Enter a number: 1

Product of inputted number with 25: 25

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09.exe (process 14520) exited normally.
Press any key to close this window . . .

Q2:

```
Lab09.asm  + X
TITLE My Nineth Lab Tasks (Lab09.asm)
INCLUDE Irvine32.inc
.data
    res BYTE "After expanding EBX: ", 0
.code
    main PROC
        mov eax, 0
        mov ebx, 0
        mov bx, -128
        mov ax, bx
        cwd

        shl edx, 16
        mov ebx, eax
        call dumpregs
        mov edx, offset res
        call writestring
        call writedec
        call crlf
        exit
    main ENDP
END main
```

Microsoft Visual Studio Debug Console

EAX=0000FF80 EBX=0000FF80 ECX=004510AA EDX=FFFF0000
ESI=004510AA EDI=004510AA EBP=00B7FC98 ESP=00B7FC8C
EIP=0045367D EFL=00000287 CF=1 SF=1 ZF=0 OF=0 AF=0 PF=1

After expanding EBX: 65408

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09.exe (process ID 1234)
Press any key to close this window . . .

Q3:

Lab09.asm

```
TITLE My Nineth Lab Tasks (Lab09.asm)
INCLUDE Irvine32.inc
.data
    res BYTE "bMinutes = ", 0
    bMinutes BYTE ?
.code
    main PROC
        mov eax, 0
        mov ebx, 0
        mov ax, 0ABCDh
        shr ax, 5

        and ax, 3Fh
        mov bMinutes, al
        mov edx, offset res
        call writestring
        movzx eax, bMinutes
        call writedec
        call crlf
        exit
    main ENDP
END main
```



Microsoft Visual Studio Debug Console



bMinutes = 30

E:\Visual Studio Projects\COAL Lab09\
Press any key to close this window .

Q4:

```
Lab09.asm  [icon] [x]
TITLE My Nineth Lab Tasks (Lab09.asm)
INCLUDE Irvine32.inc
.data
    with byte "with SHRD: ", 0
    without byte "without SHRD: ", 0
.code
main PROC
    mov eax, 0
    mov ebx, 0
    mov edx, offset without
    call writestring
    call crlf
    mov ax, 10h
    mov bx, 20h

    shr ax, 1
    and bx, 7FFFh
    rcr bx, 1
    call dumpregs

    mov edx, offset with
    call writestring
    call crlf
    mov ax, 10h
    mov bx, 20h
    SHRD bx, ax, 1
    call dumpregs
    exit
main ENDP
END main
```

Microsoft Visual Studio Debug Console

without SHRD:

EAX=00000008	EBX=00000010	ECX=005A10AA	EDX=005A600C
ESI=005A10AA	EDI=005A10AA	EBP=00B9FDB0	ESP=00B9FDA4
EIP=005A3691	EFL=00000202	CF=0	SF=0 ZF=0 OF=0 AF=0 PF=0

with SHRD:

EAX=00000010	EBX=00000010	ECX=005A10AA	EDX=005A6000
ESI=005A10AA	EDI=005A10AA	EBP=00B9FDB0	ESP=00B9FDA4
EIP=005A36B2	EFL=00000202	CF=0	SF=0 ZF=0 OF=0 AF=0 PF=0

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09.exe (process
Press any key to close this window . . .)

Q5:

Lab09.asm

```
mov edx, offset input
call writestring
call readint
mov val1, eax
mov edx, offset input
call writestring
call readint
mov val2, eax
mov edx, offset input
call writestring
call readint
mov val3, eax

mov eax, val2
mov edx, 0
IDIV val3
PUSH eax

mov eax, val1
mov edx, 0
IDIV val2

POP ebx
mul ebx
mov val1, eax
call crlf
mov edx, offset res
call writestring
call writedec
exit
```



Microsoft Visual Studio Debug Console



```
Enter a number: 5
Enter a number: 3
Enter a number: 2
```

Ans = 1

E:\Visual Studio Projects\COAL Lab09\
Press any key to close this window .

Q6:

Lab09.asm

```
    res byte "Ans = ", 0
.code
main PROC
    mov eax, DWORD PTR num1
    mov ebx, DWORD PTR num1 + 4
    mov ecx, DWORD PTR num2
    mov edx, DWORD PTR num2 + 4

    call Extended_Add
    mov DWORD PTR ans, eax
    mov DWORD PTR ans + 4, ebx

    mov edx, offset res
    call writestring
    mov eax, DWORD PTR ans + 4
    call writehex
    mov eax, DWORD PTR ans
    call writehex
    call crlf
    exit
main ENDP

Extended_Add PROC
    add eax, ecx
    mov ebx, eax
    adc ebx, edx

    ret
Extended_Add ENDP
END main
```

Microsoft Visual Studio Debug Console

Ans = 6BA987FF06666666

E:\Visual Studio Projects\COAL Lab09\
Press any key to close this window .

Q7:

Lab09.asm

```
isPrime PROC
    push eax
    mov ecx, 2

L2:
    mov eax, [esp]
    cdq
    div ecx
    cmp edx, 0
    je not_prime_back

    inc ecx
    mov eax, [esp]
    cmp ecx, eax
    jl L2

    jmp prime_num_back

not_prime_back:
    mov edx, offset no
    call writestring
    call crlf
    jmp cleanup

prime_num_back:
    mov edx, offset yes
    call writestring
    call crlf

cleanup:
    pop eax
    ret
```

Microsoft Visual Studio Debug

Enter a number to check Prime: 27
Non-prime number.

Enter a number to check Prime: 2001
Non-prime number.

Enter a number to check Prime: 17
Prime number!

Enter a number to check Prime: 2
Prime number!

Enter a number to check Prime: 3
Prime number!

Enter a number to check Prime: 5
Prime number!

Enter a number to check Prime: 1

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09
Press any key to close this window . . .|

Q8:

Lab09.asm

```
    mov ebx, 0
    loop encryptionLoop

done:
    call crlf
    call crlf
    mov edx, offset after
    call writeString
    mov edx, OFFSET encryptedMessage
    call WriteString
    call crlf
    exit
main ENDP

rotateByte PROC
    mov cl, dl
    cmp dl, 0
    jge rotateRight
    neg dl

    mov cl, dl
    shl al, cl
    rol al, cl
    ret

rotateRight:
    mov cl, dl
    mov dl, cl
    shr al, cl
    mov cl, dl
    rol al, cl
    ret
rotateByte ENDP
```



Microsoft Visual Studio Debug Console



Original text: Muhammad Muzammil Siddiqui

After encryption: Lphah`` `@tp`mh`l P@d`hqp`

E:\Visual Studio Projects\COAL Lab09\Debug\COAL Lab09.exe
Press any key to close this window . . .|