SC165

PROBLEM STATEMENT: Write X86/64 ALP to perform multiplication of two 8-bit hexadecimal numbers. Use successive addition and add and shift method. (use of 64-bit registers
is expected).

```
%macro print 2
mov rax,1
mov rdi,1
mov rsi,%1
mov rdx,%2
syscall
%endmacro

%macro accept 2
mov rax,0
mov rdi,0
mov rsi,%1
mov rdx,%2
syscall
%endmacro


section .data
msg db " ",10
db "multiplication using -",10
db "1.successive addtion method",10
db "2.Add Shift method",10
db "3.Exit",10
db "Enter your choice ="
len equ $-msg

msg1 db "Enter first HEX no. ="
len1 equ $-msg1
msg2 db "Enter second HEX no. ="
len2 equ $-msg2
msg3 db "multiplication = "
len3 equ $-msg3

section .bss
numascii resb 6
result resb 8
```

```
opbuff resb 5
num1 resb 4
num2 resb 4


section .text
global _start
_start:

print msg,len
accept numascii,2

case1:
cmp byte[numascii],'1'
jne case2
call sam
jmp _start

case2:
cmp byte[numascii],'2'
jne case3
call asm
jmp _start

case3:
cmp byte[numascii],'3'
jmp ex

ex:
mov rax,60
mov rdi,0
syscall

sam:
print msg1,len1
accept numascii,3
call packnum
mov [num1],bl

print msg2,len2
accept numascii,3
call packnum
mov ax,0
```

```
up:
add ax,[num1]
dec bl
jnz up

mov bx,ax
call display
ret

asm:
print msg1,len1
accept numascii,5
call packnum
mov [num1],bl

print msg2,len2
accept numascii,5
call packnum
mov [num2],bl

mov ax,00h
mov dx,00h
mov al,[num1]
mov bl,[num2]
mov cx,00h
mov dl,08

l2:
shr bl,01h
jnc l1
add cx,ax

l1:
shl al,01
dec dl
jnz l2
mov rbx,rcx
call display
ret

packnum:
mov bl,0
mov ecx,02
mov esi ,numascii
```

```
up2:
   rol bl, 04
   mov al,[esi]
   cmp al,39h
   jbe skip1
   sub al,07h
  skip1:
       sub al,30h
       add bl,al
       inc esi
       loop up2
ret

display:
mov rdi,result
mov rcx,16

up1:
rol bl,4
mov al, bl
and al, 0fh
cmp al, 09h
jbe skip

and al, 07h


skip:
add al,30h
mov[rdi],al
inc rdi

loop up1
print result,2
ret
```

OUTPUT

```
hardware@hardware-System-Product-Name:~/Desktop$ nasm -f elf64 as10.asm
hardware@hardware-System-Product-Name:~/Desktop$ ld -o a as10.o
hardware@hardware-System-Product-Name:~/Desktop$ ./a

multiplication using -
1.successive addtion method
2.Add Shift method
3.Exit
Enter your choice =1
Enter first HEX no. =02
Enter second HEX no. =03
06
multiplication using -
1.successive addtion method
2.Add Shift method
3.Exit
Enter your choice =2
Enter first HEX no. =02
Enter second HEX no. =03
06
multiplication using -
1.successive addtion method
2.Add Shift method
3.Exit
Enter your choice =3
hardware@hardware-System-Product-Name:~/Desktop$
```