;------------------------------------------------------------------------------- ; ;Write 80387 ALP to obtain: i) Mean ii) Variance iii) Standard Deviation

;-------------------------------------------------------------------------------

%macro input 2

mov rax,0

mov rdi,0

mov rsi,%1

mov rdx,%2

syscall

%endm

%macro exit 0

mov rax,60

mov rdi,0

syscall

%endm

%macro output 2

mov rax,1

mov rdi,1

mov rsi,%1

mov rdx,%2

syscall

%endm

section .bss

section .data

msg db 0ah,'Mean = '

msg\_len equ $-msg

msg2 db 0ah,'Variance = '

msg2\_len equ $-msg2

msg3 db 0ah,'Standard Deviation = '

msg3\_len equ $-msg3

arr dw 2,5,8

arr\_len dw 3

a dw 100

mean dt 0.0

final dt 0.0

global \_start

section .text

\_start:

mov rcx,0

mov cx,word[arr\_len]

fldz

mov rsi,arr

up: fiadd word[rsi]

add rsi,2

loop up

fidiv word[arr\_len]

fimul word[a]

fbstp [mean]

call conv

output msg,msg\_len

output final,9

mov rcx,0

mov cx,word[arr\_len]

fldz

mov rsi,arr

up2: fbld [mean]

fidiv word[a]

fisub word[rsi]

fmul st0,st0

fadd st0,st1

add rsi,2

loop up2

fidiv word[arr\_len]

fimul word[a]

fbstp [mean]

call conv

output msg2,msg2\_len

output final,9

fbld [mean]

fsqrt

fbstp [mean]

call conv

output msg3,msg3\_len

output final,9

exit

conv :

mov rsi,mean

add rsi,3

mov rcx,4

mov rdi,final

mov rdx,2

up1: rol byte[rsi],4

mov rax,[rsi]

and rax,0fh

add rax,30h

cmp rax,39h

jbe e

add rax,7h

e: mov [rdi],rax

inc rdi

dec rdx

jnz up1

mov rdx,2

cmp rcx,2

jne down

mov byte[rdi],'.'

inc rdi

down:dec rsi

loop up1

ret

**OUTPUT :**

manu@ubuntu:~/MP$ nasm -felf64 A11.nasm

manu@ubuntu:~/MP$ ld -o A11 A11.o

manu@ubuntu:~/MP$ ./A11

Mean = 000005.00

Variance = 000006.00

Standard Deviation = 000000.24