MICROPROCESSOR ASSIGNMENTS

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PROBLEM STATEMENT :

Write 80387 ALP to obtain: i) Mean ii) Variance iii) Standard Deviation Also plot the histogram for the data set. The data elements are available in a text file.

CODE :

section .data

amsg db "Array Elements are:", 0

mmsg db "Calculation of mean:", 0

stdmsg db "calculation of std dev: ", 0

varmsg db "calculation of varience is: ", 0

fmt db "%s", 10, 0 ;nrml var ahe ha

array dq 123.45, 120.88, 111.00

;array dq 1.00, 1.00, 1.00

cnt dd 03

fmt1 db "%e", 10, "%e", 10, "%e", 10, 0

fmt2 db "%e", 10, 0

section .bss

mean resq 1

var resq 1

stddev resq 1

section .text

global main

extern printf ;printf is a external entity to this program

main:

push rsp ;always push kar for stack printf function

mov rdi, fmt ;kay ahe tuzha display karacha te (string msg %s wala rdi madhe jata)

mov rsi, amsg ;(apla nrml msg la point karacha)

mov rax, 0 ;(he kiti parameters display karacha ahe tyachasthi ahe)

call printf ;function call dila

mov rbx, array ;ekdach base la point kela rbx ni coz array display karacha ahe

mov rdi, fmt1 ;kiti variable ahet tuze te ahe

movq xmm0, [rbx] ;xmm0 is a pentium register

add rbx, 8 ;qword ahe so 8 add kela pudhe sarkala

movq xmm1,[rbx] ;xmm1 is a pentium register

add rbx, 8 ;qword ahe so 8 add kela pudhe sarkala

movq xmm2, [rbx] ;xmm2 is a pentium register

add rbx, 8 ;qword ahe so 8 add kela pudhe sarkala

mov rax, 3 ;3 ahet na array elements so 3

call printf

;mean program

finit

fldz

mov rbx, array

mov rcx, 03

bk : fadd qword[rbx]

add rbx, 8

loop bk

fidiv dword[cnt]

fst qword[mean]

mov rdi, fmt

mov rsi, mmsg

mov rax, 0

call printf

mov rdi,fmt2

movq xmm0, qword[mean]

mov rax,1

call printf

;varience code

mov rsi, array

mov rcx, 03

bk1 : fldz

fld qword[rsi]

fsub qword[mean]

fst ST1

fmulp st1, st0 ; or fmulp (only)

fadd ;check it

add rsi, 8

loop bk1

fidiv dword[cnt]

fst qword[var]

mov rdi, fmt

mov rsi, varmsg

mov rax, 0

call printf

mov rdi,fmt2

movq xmm0, qword[var]

mov rax,1

call printf

;std dev code

fldz

fld qword[var]

fsqrt

fst qword[stddev]

mov rdi, fmt

mov rsi, stdmsg

mov rax, 0

call printf

mov rdi, fmt2

movq xmm0, qword[stddev]

mov rax, 1

call printf

pop rbp

mov rax,60

mov rdi,0

syscall

OUTPUT :

