Assignment 5

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Batch: A4

Write ALP to find the roots of the quadratic equation. All the possible cases must be considered in calculating the roots.

CODE:

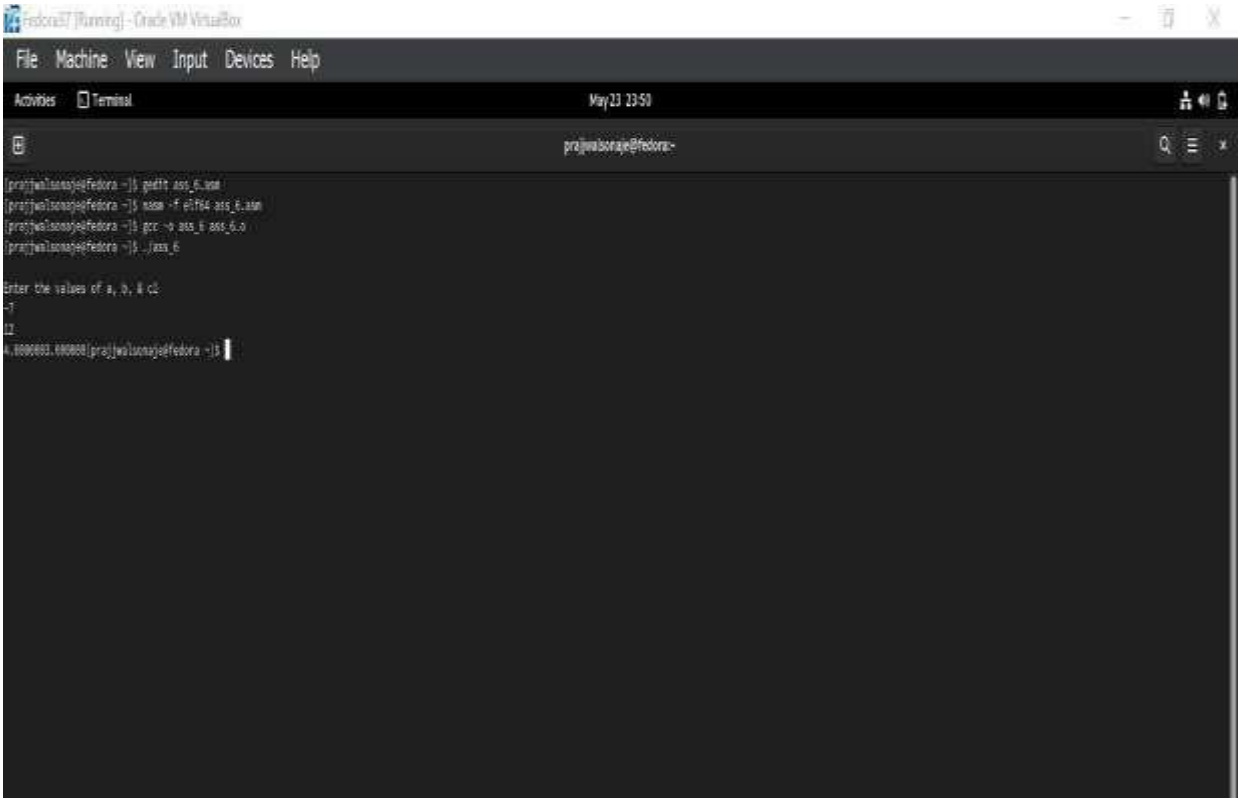
```
extern printf, scanf


%macro write 2
   push rbp
mov rax, 0
mov rdi, %1
mov rsi, %2
   call printf
pop rbp
%endmacro

%macro scan 2
   push rbp
mov rax, 0
mov rdi, %1
mov rsi, %2
call scanf
pop rbp
%endmacro
```

```
%macro printfloat 2
   push rbp
mov rax, 1
mov rdi, %1
   movsd xmm0, %2
   call printf
pop rbp
%endmacro

section .data     m1 db "%lf", 0     m2 db "%s", 0
msg1 db 10, "Enter the values of a, b, and c: ", 0
msg2 db 10, "The roots are: ", 0     linebreak db
10, 0 ; Line break character

section .bss
a resb 8     b
resb 8     c
resb 8     temp
resw 1
   t1 resb 8
t2 resb 8     t3
resb 8     t4
resb 8     r1
resb 10     r2
resb 10
section .text
global main
main:
```

```
write m2,
msg1     scan
m1, a     scan
m1, b     scan
m1, c

finit
   fld qword[b]
fmul st0, st0     fstp
qword[t1]

   fld qword[a]
fmul qword[c]
mov word[temp], 4
fimul word[temp]
fstp qword[t2]

   fld qword[t1]
fsub qword[t2]
fstp qword[t4]

   fld qword[t4]
Fabs     Fsqrt
fstp qword[t1]

   fld qword[b]
Fchs     fstp
qword[t2]     fld
qword[a]     mov
```

```
qword[temp], 2
fimul
word[temp]
fstp qword[t3]

   cmp qword[t4], 0
je equal_root

   fld qword[t2]
fadd qword[t1]
fdiv qword[t3]
fstp qword[r1]

equal_root:    fld
qword[t2]    fsub
qword[t1]    fdiv
qword[t3]    fstp
qword[r2]

   write m2, msg2    printfloat
m1, [r1]    write m2, linebreak ;
Line break    printfloat m1, [r2]
write m2, linebreak ; Line break

   mov rax, 0
   ret
```

OUTPUT:


Fedora37 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal
May 23 23:50
prajwalsonaje@fedora:~
[prajwalsonaje@fedora ~]$ gedit ass_6.asm
[prajwalsonaje@fedora ~]$ nasm -f elf64 ass_6.asm
[prajwalsonaje@fedora ~]$ gcc -o ass_6 ass_6.o
[prajwalsonaje@fedora ~]$ ./ass_6
Enter the values of a, b, & c1
-7
22
4.0000003.000000[prajwalsonaje@fedora ~]$