Computer Organisation & Architecture Assignment No. 6

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Batch: C3

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Problem Statement:

Write Perform the arithmetic operations by executing the ALP by using any CPU simulator.

Source 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 Screen:**