***NAME : SAOOD UR RAHMAN***

***ROLL # 17P6092***

***SECTION “A”***

***IA32 architecture floating point unit***

A floating-point unit, is a part of a computer system specially designed to carry out operations on floating point numbers. Typical operations are addition, subtraction, multiplication, division, square root etc.

The IA-32 has a floating point unit that is used expressly for high speed floating point arithmetic.

There are eight floating point data registers in FPU, named ST(0) , ST(1), ST(2), ST(3), ST(4), ST(5), ST(6) and ST(7).

***INSTRACTION SET:***

|  |  |
| --- | --- |
| fld1 | Pushes into the floating-point registers the constant 1.0 |
| fldz | Pushes into the floating-point registers the constant 0.0 |
| fldpi | Pushes the constant |
| fld DWORD [eax] | Pushes into the floating-point registers the 4-byte "float" loaded from memory at address eax.  This is how most constants get loaded into the program. |
| fild DWORD [eax] | Pushes into the floating-point registers the 4-byte "int" loaded from memory at address eax. |
| fld QWORD [eax] | Pushes an 8-byte "double" loaded from address eax. |
| fld st0 | Duplicates the top float, so there are now two copes of it. |
| fstp DWORD [eax] | Pops the top floating-point value, and stores it as a "float" to address eax. |
| fst DWORD [eax] | Reads the top floating-point value and stores it as a "float" to address eax.   This doesn't change the value stored on the floating-point stack. |
| fstp QWORD [eax] | Pops the top floating-point value, and stores it as a "double" to address eax. |
| faddp | Add the top two values, pushes the result. |
| fsubp | Subtract the two values, pushes the result.   Note "fld A; fld B; fsubp;" computes A-B.   There's also a "fsubrp" that subtracts in the opposite order (computing B-A). |
| fmulp | Multiply the top two values. |
| fdivp | Divide the top two values.  Note "fld A; fld B; fdivp;" computes A/B.   There's also a "fdivrp" that divides in the opposite order (computing B/A). |
| fabs | Take the absolute value of the top floating-point value. |
| fsqrt | Take the square root of the top floating-point value. |
| fsin | Take the sin() of the top floating-point value, treated as radians. |

***EXAMPLES (1):***

include irvine32.inc

.data

a real4 3.21

b real4 3.04

.code

main proc

fld a ;load a into ST(0)

fadd b ;Add the top two values, pushes the result

exit

main endP

end main

***EXAMPLES (2):***

include irvine32.inc

.data

a real4 3.21

b real4 3.04

.code

main proc

fld a ;load a into ST(0)

fsub b ;sub the top two values, pushes the result

exit

main endp

end main

***EXAMPLES (3):***

include irvine32.inc

.data

a real4 3.21

b real4 3.04

.code

main proc

fld a ;load a into ST(0)

fMUL b ;MUL the top two values, pushes the result

exit

main endP

end main