SSN College of Engineering
Department of Computer Science and Engineering
III year - UCS1512 – Microprocessors Lab

Academic Year: 2022 -2023 Batch: 2020-2024
Semester: V

Experiment No. 9: Floating point operations

9a) Floating point addition

Input: 2 floating point numbers
Output: Sum of floating point numbers

Program

```
ASSUME      CS:CODESEG, DS:DATASEG
; -------------------------------------------------------------
DATASEG     SEGMENT                     ; start of data segment
        ORG     00H             ; directive to assign an offset address for a variable
X       DD      20.4375
        ORG     10H
Y       DD      20.4375
        ORG     20H
SUM     DD      ?
DATASEG     ENDS                    ; end of data segment
; -------------------------------------------------------------
CODESEG     SEGMENT                     ; start of code segment
start:  MOV     AX,DATASEG      ; load the data segment address
        MOV     DS,AX           ; assign value to DS
        FINIT                   ; initialize 8087 stack
        FLD     X               ; load X into ST(0)
        FLD     Y               ; load Y into ST(0)

        FADD    ST(0),ST(1)     ; ST(0) = X+Y

        FST     SUM             ; store ST(0) in sum

        MOV     AH,4CH          ; setup function-4C of the int21
        INT     21H             ; call BIOS int21 to return to DOS
CODESEG     ENDS                    ; end of code segment
        END START
```

9b) Floating point subtraction

Input: 2 floating point numbers
Output: difference of floating point numbers

Program

```
ASSUME      CS:CODESEG, DS:DATASEG
; ---------------------------------------------------------------
DATASEG     SEGMENT                     ; start of data segment
        ORG     00H             ; directive to assign an offset address for a variable
X       DD      20.4375
        ORG     10H
Y       DD      0.125
        ORG     20H
SUM     DD      ?
DATASEG     ENDS                    ; end of data segment

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

CODESEG     SEGMENT                     ; start of code segment

start:  MOV     AX,DATASEG      ; load the data segment address
        MOV     DS,AX           ; assign value to DS

        FINIT                   ; initialize 8087 stack
        FLD     Y               ; load X into ST(0)
        FLD     X               ; load Y into ST(0)

        FSUB    ST(0),ST(1)     ; ST(0) = X+Y

        FST     SUM             ; store ST(0) in sum

        MOV     AH,4CH          ; setup function-4C of the int21
        INT     21H             ; call BIOS int21 to return to DOS



CODESEG     ENDS                    ; end of code segment
        END START
```