```
; Program that determines the Surface of a circle with the radius of R
; And a sphere with radius R

DATE            SEGMENT PARA    'DATA'   ; SEGMENT DECLARATION DATE
RAZA            DQ      8. 567
ARIE            DQ      ?                ; RESERVE SPACE
VOLUM           DQ      ?                ; RESULTS
PATRU           DD      4. 0
TREI            DD      3. 0
DATE            ENDS

COD             SEGMENT PARA    'CODE'   SEGMENT DECLARATION
COD
CALCUL  PROC    FAR                      ; DECLARATION OF FAR PROCEDURE
                ASSUME CS   COD, DS: DATE

                PUSH    DS               ; PREPARE
                XOR     AX, AX           ; STACK FOR
                PUSH    AX               ; DOS RETURN
                MOV     AX, DATE         ; LOADING DS
                MOV     DS, AX           ; WITH DATA SEGMANT

                FINIT                    ; COPROCESOR INITIALIZATION
                FLD     RAZA             ; LOAD RAZA ON COPROC STACK
                FMUL    RAZA             ; CALCULATING R x R
                FLDPI                    ; LOAD PI TO COPROC STACK
                FMUL                     ; CALCULATING R x R x PI
                FSTP    ARIE             ; SAVING RESULT
                FWAIT                    ; SYNCHRONIZATION


                LEA     SI, VOLUM        ; VOLUM ADDRSS IN SI
                FINIT                    ; COPROCESOR INITIALIZATION
                FLD     RAZA             ; COMPUTATION
                FMUL    RAZA             ; R x R
                FMUL    RAZA             ; R x R x R
                FLDPI                    ; LOAD PI
                FMUL                     ; MULTYPLY WITH PI
                FMUL    PATRU            ; MULTIPLY WITH FOUR
                FDIV    TREI             ; DIVISION BY 3
                FSTP QWORD PTR [SI]      ; SAVING RESULT
                FWAIT                    ; SYNCHRONIZATION

                RET
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8087 orientated 8086 code which calculates the surface of a circle and the volume of a sphere. Note use of FMUL, FSTP and FWAIT before LEA (middle). The processor will transfer FMUL to the co-processor. The processor will stall on FSTP until the co-processor performs FMUL and can subsequently accept the FSTP instruction. The programmer wants FSTP to complete before continuing with LEA. FWAIT is a pseudo-instruction which will stall the CPU until the FSTP instruction is complete and the LEA instruction can then be performed by the CPU.

Code section last accessed 12.05.2014 from:
ftp.utcluj.ro%2Fpub%2Fusers%2Facosmin%2FPLA%2FEngleza%2FL11%2520Using%2520math%2520coprocessor.doc