**Microprocessor and Interfacing – CSE2006**

**Module 6 – Advanced ALP**

1. **ALP Programming**

1. Write a program to add three numbers and store the result.

finit 🡪 Initialize the coprocessor to start at the beginning of the stack

fld X 🡪 Load X into ST(0); ST(0) = X

fld Y 🡪 ST(0) = Y, ST(1) = X

fld Z 🡪 ST(0) = Z, ST(1) = Y, ST(2) = Z

fadd ST(1) 🡪 Add Y and Z and store the result in ST(0)

fadd ST(2) 🡪 Add X and Y+Z and store the result in ST(0)

fst sum 🡪 Store the added result in the memory location named ‘sum’

2. Write a program to verify the equation , for any given value of ‘x’.

|  |  |
| --- | --- |
|  | data segment |
|  | theta dd 180 |
|  | theta dd 30.156 |
|  | x dd ? |
|  | y dd ? |
|  | h dd ? |
|  | answer dd ? |
|  | data ends |
|  |  |
|  | code segment |
|  | assume cs:code,ds:data |
|  | start:mov ax,data |
|  | mov ds,ax |
|  | finit |
|  | fld theta |
|  | fld theta |
|  | fldpi |
|  | fmul |
|  | fdiv |
|  |  |
|  | fptan |
|  | fstp x |
|  | fst y |
|  | fmul st(0),st(0) |
|  | fld x |
|  | fmul st(0),st(0) |
|  | fadd |
|  | fsqrt |
|  | fld x |
|  | fdiv st(0), st(1) |
|  | fmul st(0), st(0) |
|  | fld y |
|  | fdiv st(0), st(2) |
|  | fmul st(0), st(0) |
|  | fadd |
|  | fstp answer |
|  | mov ah,4ch |
|  | int 21h |
|  | code ends |
|  | end start |

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* <http://www.bitsavers.org/pdf/intel/ISIS_II/121703-003_ASM86_Language_Reference_Manual_Nov83.pdf>
* <https://gist.github.com/tanayseven/3901640>