int shift_add_multiply(unsigned short X, unsigned short Y) {
    unsigned int A = (unsigned int) X;
    unsigned short B = Y;
    unsigned int P = 0;

    return P;
}

FSM inputs and outputs
A (2N-bit reg)  

B (N-bit reg)  

P (2N-bit reg)  

Wait  

Do Nothing  

Shift  

Shift-Add  

Done