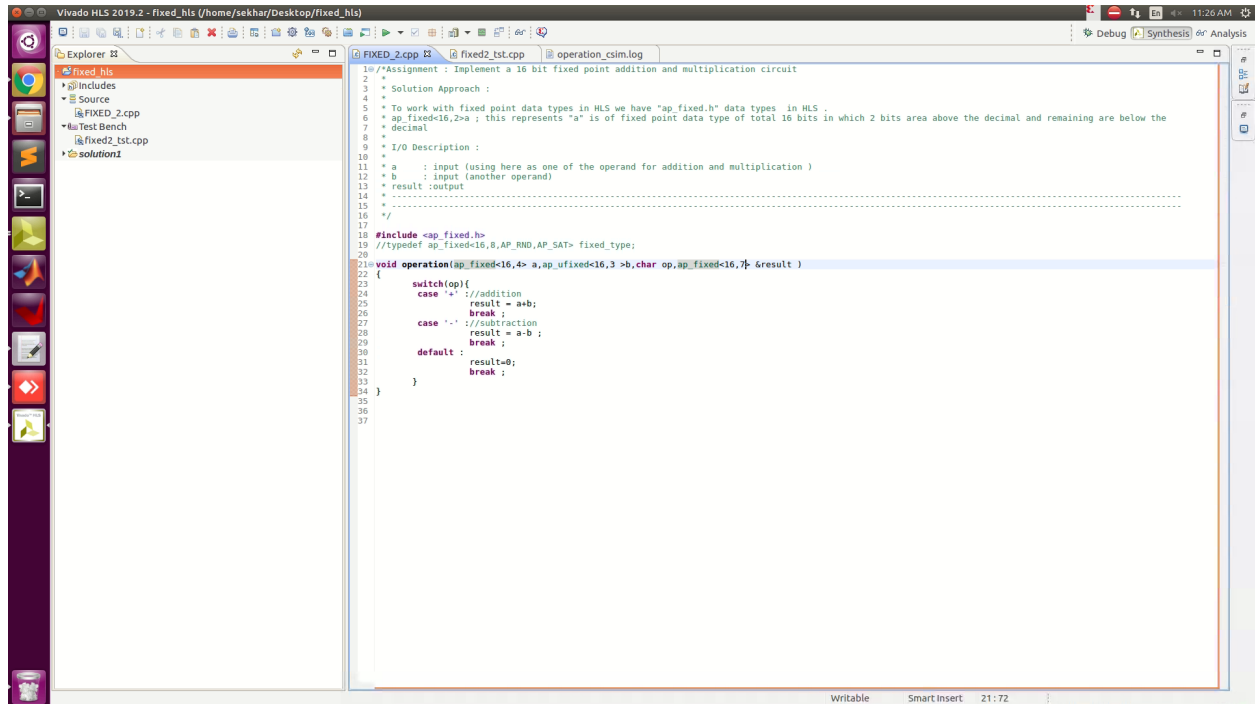


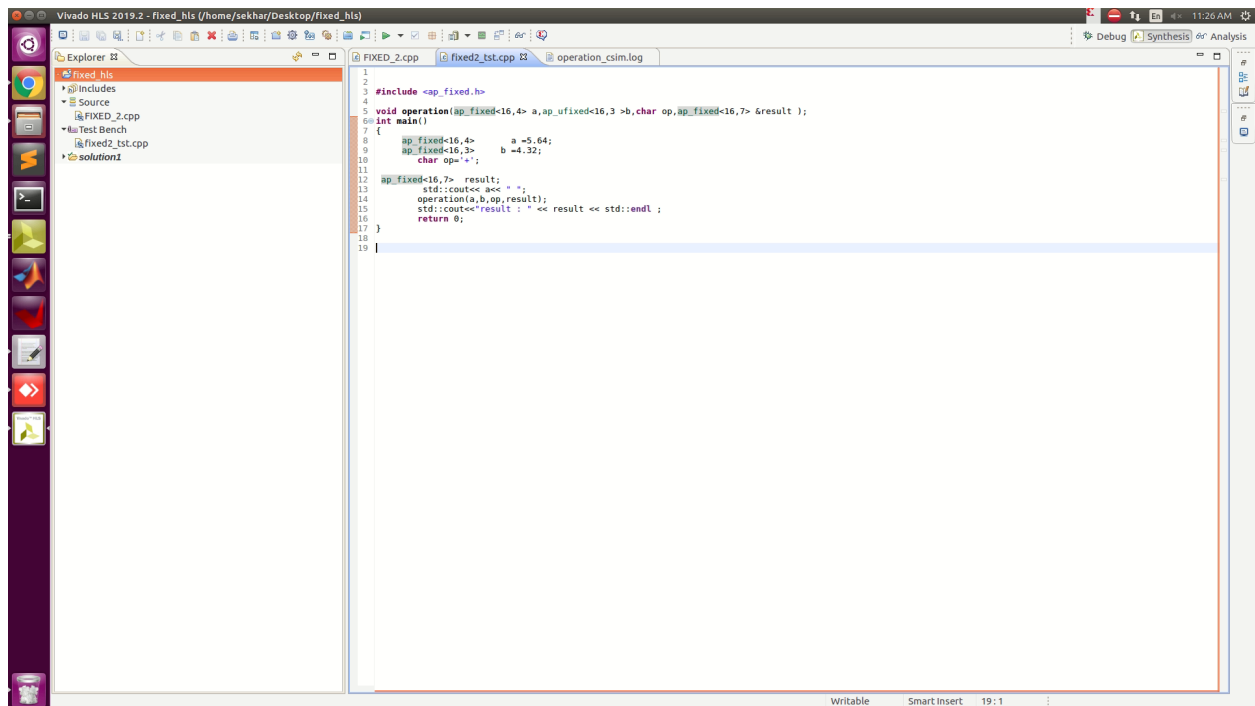
Assignment-6

Implement a 16 bit fixed point addition and multiplication circuit

Simulation :



```
10 /*Assignment : Implement a 16 bit fixed point addition and multiplication circuit
11 *
12 * Solution Approach :
13 *
14 * To work with fixed point data types in HLS we have "ap_fixed.h" data types in HLS .
15 * ap_fixed<16,2>a ; this represents "a" is of fixed point data type of total 16 bits in which 2 bits area above the decimal and remaining are below the
16 * decimal
17 * I/O Description :
18 *
19 * a : input (using here as one of the operand for addition and multiplication )
20 * b : input (another operand)
21 * result : output
22 *
23 * .....
24 */
25
26 #include <ap_fixed.h>
27 //typedef ap_fixed<16,8,AP_RND,AP_SAT> fixed_type;
28
29 void operation(ap_fixed<16,4> a, ap_ufixed<16,3> b, char op, ap_fixed<16,7> &result )
30 {
31     switch(op){
32         case '+': //addition
33             result = a+b;
34             break ;
35         case '-': //subtraction
36             result = a-b ;
37             break ;
38         default :
39             result=0;
40             break ;
41     }
42 }
```



```
1
2
3 #include <ap_fixed.h>
4
5 void operation(ap_fixed<16,4> a, ap_ufixed<16,3> b, char op, ap_fixed<16,7> &result );
6
7 int main()
8 {
9     ap_fixed<16,4> a = -5.64;
10    ap_ufixed<16,3> b = 4.32;
11    char op = '+';
12
13    ap_fixed<16,7> result;
14    std::cout<< a<< " * " << b<< " = ";
15    operation(a,b,op,result);
16    std::cout<< "result : " << result << std::endl ;
17    return 0;
18 }
19
```

Result :

