**اشکان شکیبا (9931030)**

**Full Adder**

module fullAdder(

input x,

input y,

input ci,

output co,

output s

);

wire e1, e2, e3;

xor #(10) (s, x, y, ci);

and #(5) (e1, x, y);

and #(5) (e2, x, ci);

and #(5) (e3, y, ci);

or #(5) (co, e1, e2, e3);

endmodule

**Adder Subtractor**

module adderSubtractor(

input a,

input b,

input s,

input cin,

output cout,

output sum

);

wire e;

xor #(10) (e, s, b);

fullAdder f(a, e, cin, cout, sum);

endmodule

**Adder Subtractor 4 bit**

module adderSubtractor\_4bit(

input [3:0] a,

input [3:0] b,

input sel,

output cout,

output [3:0] s

);

wire c1, c2, c3;

adderSubtractor a1(.a(a[0]), .b(b[0]), .s(sel), .cin(sel), .sum(s[0]), .cout(c1));

adderSubtractor a2(.a(a[1]), .b(b[1]), .s(sel), .cin(c1), .sum(s[1]), .cout(c2));

adderSubtractor a3(.a(a[2]), .b(b[2]), .s(sel), .cin(c2), .sum(s[2]), .cout(c3));

adderSubtractor a4(.a(a[3]), .b(b[3]), .s(sel), .cin(c3), .sum(s[3]), .cout(cout));

endmodule