**Math314**

**Binary addition of integers**

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function xor(a, b){return (a === b ? 0 : 1);}  
function and(a, b){return a == 1 && b == 1 ? 1 : 0;}  
function or(a, b){return (a || b);}  
  
function halfAdder(a, b){  
 const sum = xor(a,b);  
 const carry = and(a,b);  
 return [sum, carry];  
}  
function fullAdder(a, b, carry){  
 halfAdd = halfAdder(a,b);  
 const sum = xor(carry, halfAdd[0]);  
 carry = and(carry, halfAdd[0]);  
 carry = or(carry, halfAdd[1]);  
 return [sum, carry];  
}  
function addBinary(a, b){  
  
 let sum = '';  
 let carry = '';  
  
 for(var i = a.length-1;i>=0; i--){  
 if(i == a.length-1){  
   
 const halfAdd1 = halfAdder(a[i],b[i]);  
 sum = halfAdd1[0]+sum;  
 carry = halfAdd1[1];  
 }else{  
   
 const fullAdd = fullAdder(a[i],b[i],carry);  
 sum = fullAdd[0]+sum;  
 carry = fullAdd[1];  
 }  
 }  
  
 return carry ? carry + sum : sum;  
}  
  
let ***a*** = prompt('Enter first binary');  
let ***b*** = prompt('sacend first binary');  
  
alert(addBinary(***a***,***b***));

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