

```
def binary_sum(a, b):
```

```
    """
```

Calculates the sum of two binary strings.

Args:

a: The first binary string.

b: The second binary string.

Returns:

The sum of the two binary strings as a binary string.

```
    """
```

```
    n = len(a)
```

```
    m = len(b)
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```
    carry = 0
```

```
    result = ""
```

$i = n - 1$

$j = m - 1$

while $i \geq 0$ or $j \geq 0$ or carry:
 $sum_bits = carry$

 if $i \geq 0$:
 $sum_bits += int(a[i])$
 $i -= 1$

 if $j \geq 0$:
 $sum_bits += int(b[j])$
 $j -= 1$

$result = str(sum_bits \% 2) + result$
Prepend the result bit
 $carry = sum_bits // 2$

return result

Test cases

```
print(binary_sum("11", "1")) # Output:  
100
```

```
print(binary_sum("1010", "1011")) #  
Output: 10101
```

```
print(binary_sum("1", "0")) # Output: 1
```

```
print(binary_sum("0", "0")) # Output: 0
```

```
print(binary_sum("111111111111", "1")) #  
Output: 1000000000000
```