

```
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)
```

```
carry = 0
```

```
result = ''
```

```
i = n - 1
```

```
j = m - 1
```

```
while i >= 0 or j >= 0 or carry:  
    sum_bits = carry
```

```
    if i >= 0:  
        sum_bits += int(a[i])  
        i -= 1
```

```
    if j >= 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
```