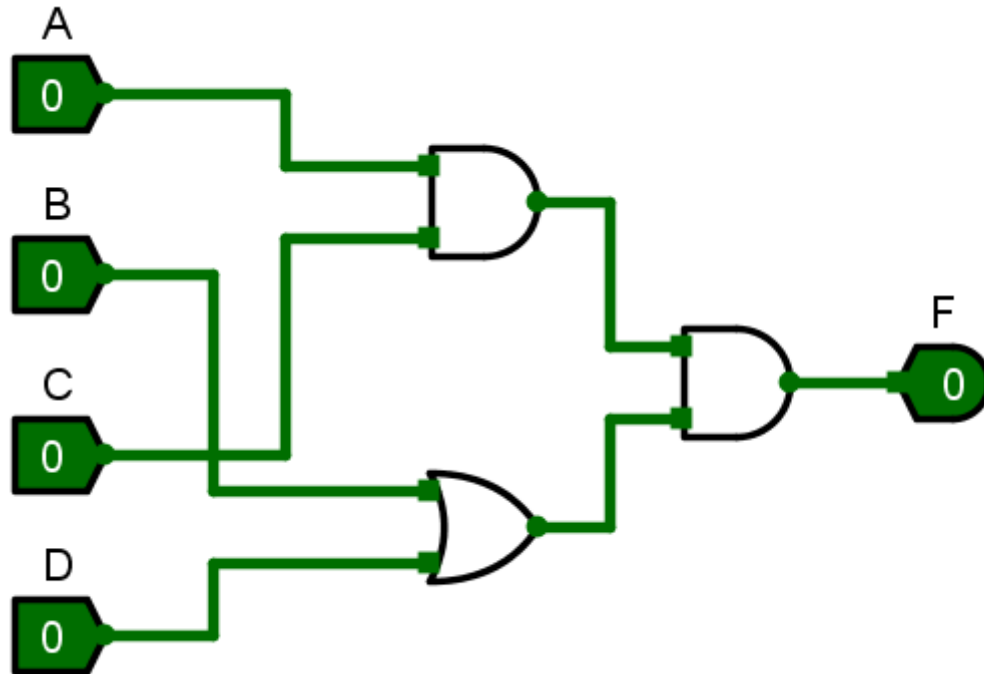


Logic Design

HW 1

1. 请根据电路图写出逻辑函数



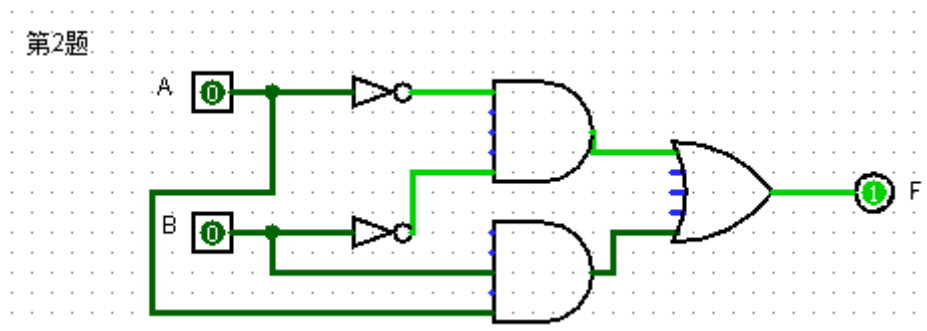
答:

$$F = AC(B + D)$$

2. 使用与、或、非门实现同或门，并在logisim中画出电路

答:

$$A \odot B = \bar{A}\bar{B} + AB$$



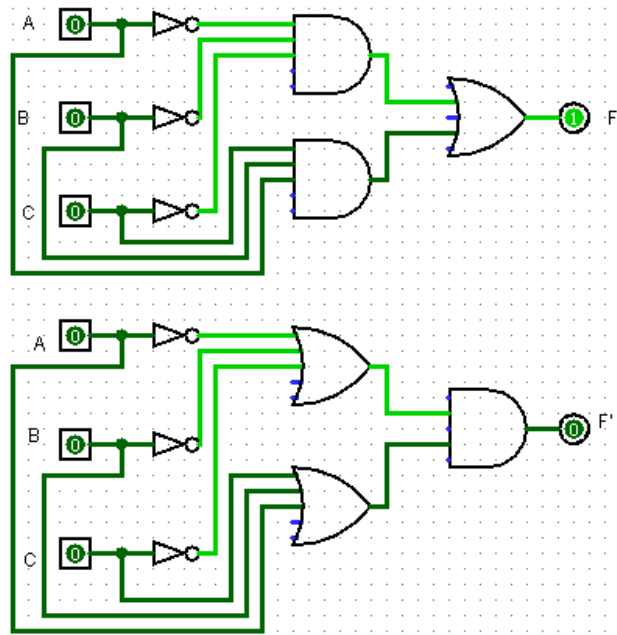
3. 请在logisim中画出逻辑函数 $F=ABC+A'B'C'$,反函数 F' 的电路

答:

$$F = ABC + A'B'C'$$

$$F' = (ABC + A'B'C')' = (A' + B' + C') \cdot (A + B + C)$$

第3题



4. 请化简逻辑函数 $F = ABC + ABD + C'D' + AB'C + A'CD' + AC'D + ABCD$, 写出最简逻辑函数并在logisim中画出对应功能的最简电路

答:

化简 $F = ABC + ABD + C'D' + AB'C + A'CD' + AC'D + ABCD$

$$F = AB(C'D')' + C'D' + AB'C + A'CD' + AC'D$$

$$= AB + C'D' + AB'C + A'CD' + AC'D$$

$$= A(B + B'C) + D'(C' + CA') + AC'D$$

$$= A(B + C) + D'(C' + A') + AC'D$$

$$= AB + AC + A'D' + C'(D' + DA)$$

$$= AB + AC + A'D' + C'D' + AC'$$

$$= AB + A + A'D' + C'D'$$

$$= A + (A' + C')D'$$

$$= A + D'$$

第4题

