

Template Week 2 – Logic

Student number: 571894

Assignment 2.1: Parking lot

Which gates do you need?

AND GATE

Complete this table

Parking lot 1	Parking lot 2	Parking lot 3	Result (full)
0	0	0	0
0	0	1	0
0	1	0	0
1	0	0	0
1	1	0	0
1	0	1	0
0	1	1	0
1	1	1	1

Assignment 2.2: Android/iPhone

Which gates do you need?

XOR

Complete this table

Android phone	iPhone	Result (Phone in possession)
0	0	0
0	1	1
1	0	1
1	1	0

Assignment 2.3: Four NAND gates

Complete this table

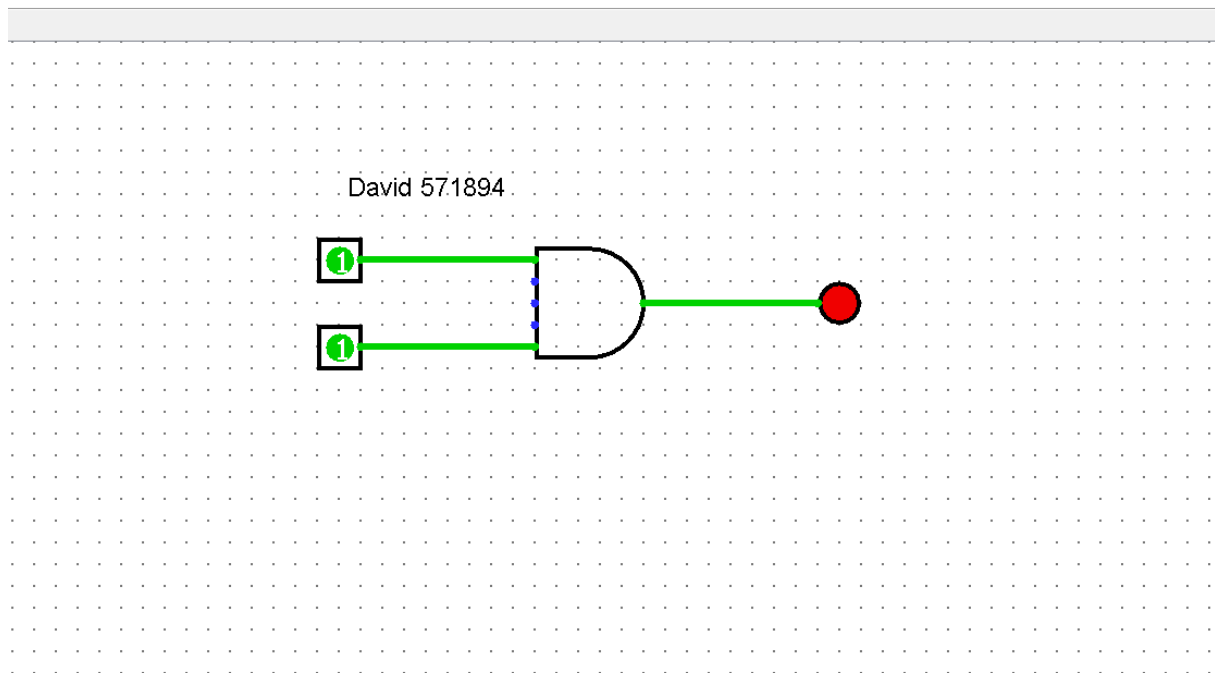
A	B	Q
0	0	1
0	1	1
1	0	1
1	1	0

How can the design be simplified?

Combining the logic

Assignment 2.4: Getting to know Logisim evolution

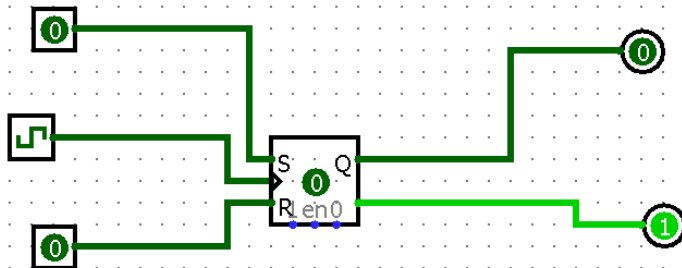
Screenshot of the design with your name and student number in it:



Assignment 2.5: SR Latch

Screenshot SR Latch in Logisim with your name and student number:

David 571894



Bonus point assignment – week 2

Create a java program that accepts user input and presents a menu with options.

1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number?

```
import java.util.Scanner;
```

```
public class Main1 {
```

```
    public static boolean isOdd(int num) {  
        return (num & 1) == 1;  
    }
```

```
    public static boolean isPowerOfTwo(int num) {  
        return (num > 0) && ((num & (num - 1)) == 0);  
    }
```

```
    public static int twoComplement(int num) {  
        return ~num + 1;  
    }
```

```

public static void displayMenu() {
    System.out.println("Please select an option:");
    System.out.println("1. Is number odd?");
    System.out.println("2. Is number a power of 2?");
    System.out.println("3. Two's complement of the number");
    System.out.println("4. Exit");
}

public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    int keuze = 0;
    int nummer = 0;

    while (true) {
        displayMenu();
        keuze = scanner.nextInt();

        if (keuze == 4) {
            System.out.println("Exiting the program. Goodbye!");
            break;
        }

        // Prompt the user for a number
        System.out.print("Enter a number: ");
        nummer = scanner.nextInt();
        switch (keuze) {
            case 1:
                if (isOdd(nummer)) {
                    System.out.println(nummer + " is odd.");
                } else {
                    System.out.println(nummer + " is even.");
                }
                break;

            case 2:
                if (isPowerOfTwo(nummer)) {
                    System.out.println(nummer + " is a power of 2.");
                } else {
                    System.out.println(nummer + " is NOT a power of 2.");
                }
                break;

            case 3:
                int complement = twoComplement(nummer);
                System.out.println("The two's complement of " + nummer + " is " + complement);
                break;

            default:

```

```
        System.out.println("Invalid choice. Please select a valid option.");
        break;
    }
}
scanner.close();
}
```

```
Please select an option:
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of the number
4. Exit
```