Template Week 2 – Logic

Student number:

Assignment 2.1: Parking lot

Which gates do you need?

2 EN gates

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
0	1	1	0
1	0	1	0
1	1	1	1

Assignment 2.2: Android or iPhone

Which gates do you need?

Een OR gate

Complete this table

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

Assignment 2.3: Four NAND gates

Complete this table

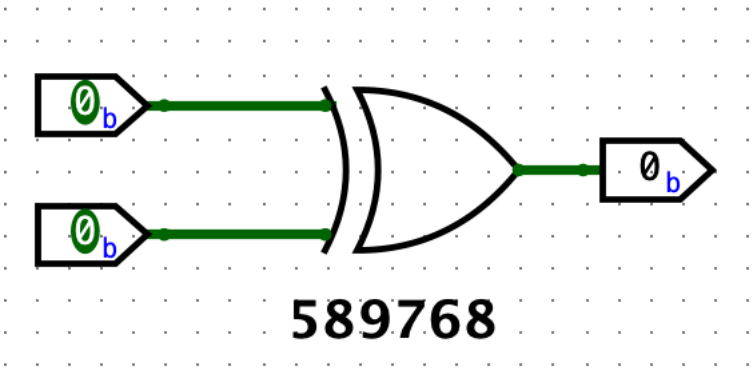
A	B	Q
1	0	1
0	1	1
0	0	0
1	1	0

How can the design be simplified?

Het design kan versimpelt worde door één XOR poort te gebruiken in dit design hoef je er maar één te gebruiken in plaats van.

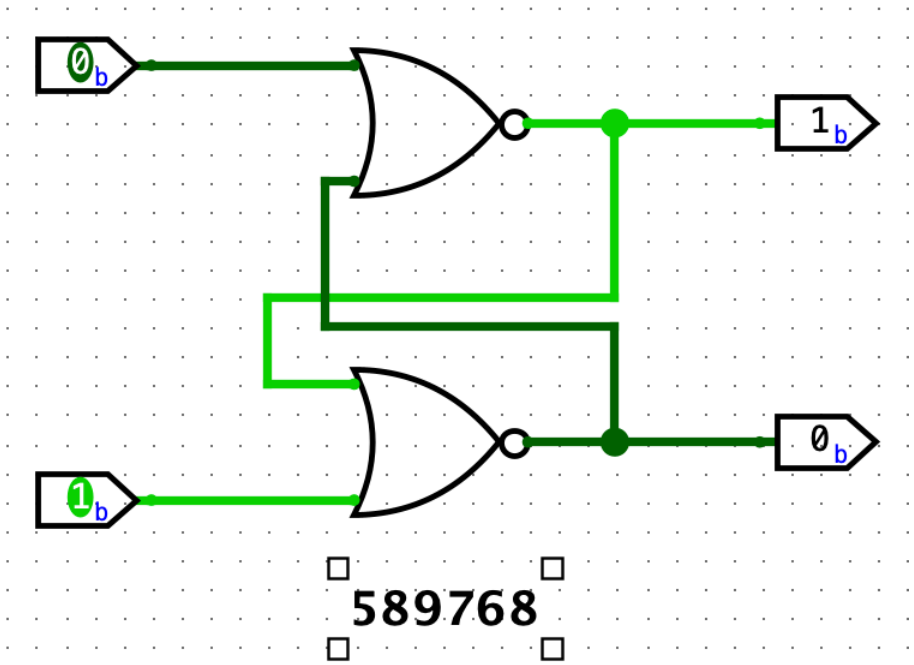
Assignment 2.4: Getting to know Logisim evolution

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



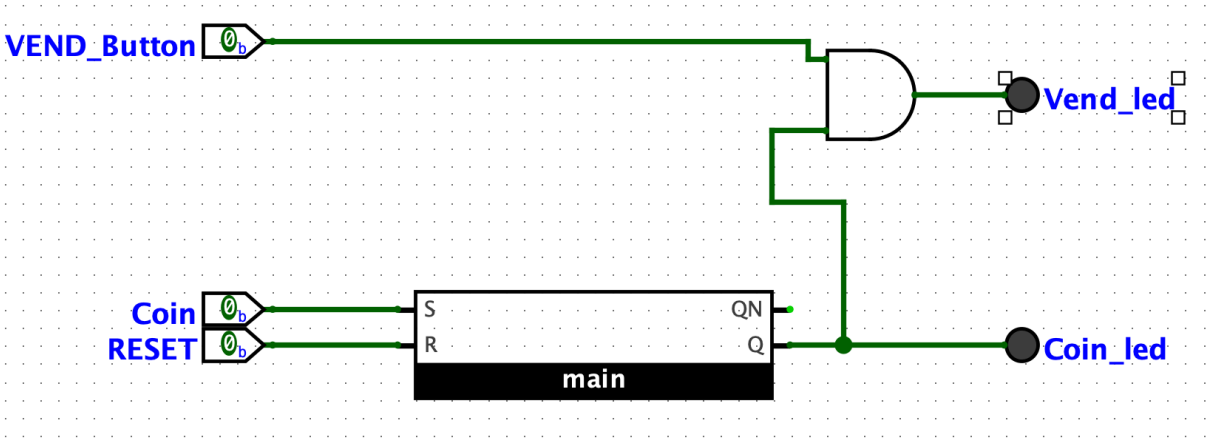
Assignment 2.5: SR Latch

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



Assignment 2.6: Vending Machine

Screenshot Vending Machine in Logisim with your name and student number:



Assignment 2.7: Bitwise operators

Complete the java source code for bitwise operators. Put the source code here.

```
public class Main {
   public static void main(String[] args) {
      int number = 7;

      if (number > 0 && (number & (number - 1)) == 0)
         System.out.println("number is a power of 2");
      else
         System.out.println("number isn't a power of 2");
   }
}
```

Assignment 2.8: Java Application Bit Calculations

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

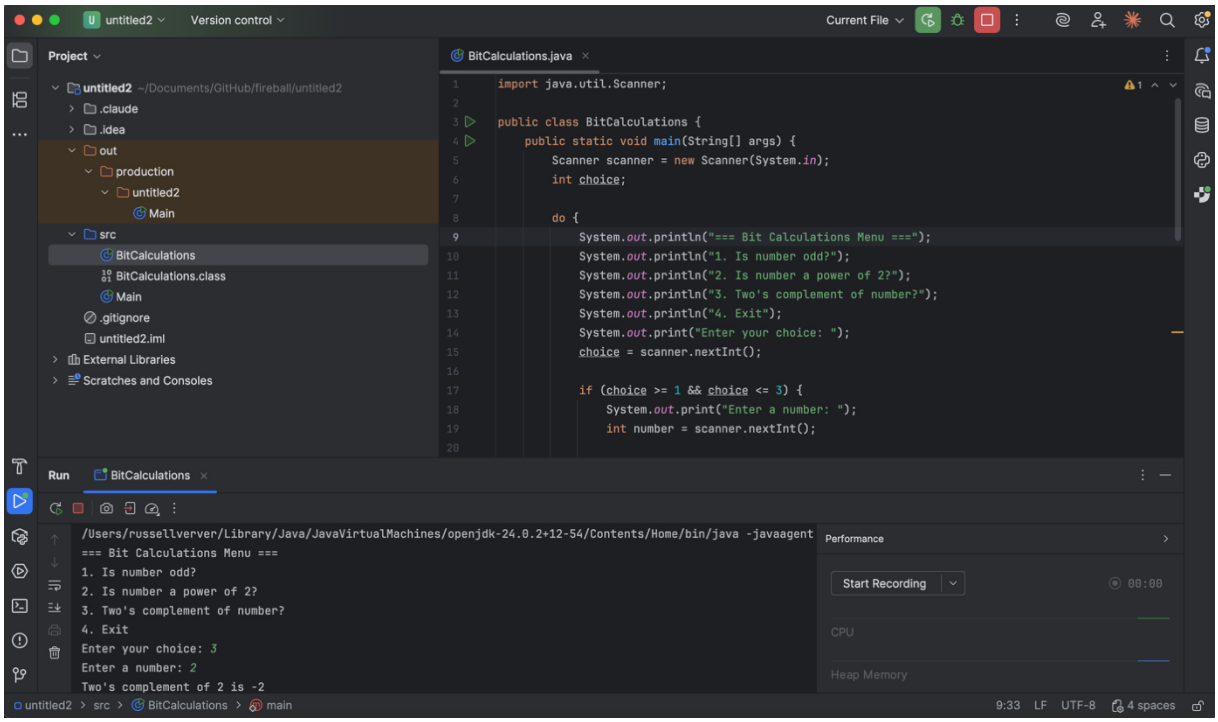
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number?

Implement the methods by using the bitwise operators you have just learned.

Organize your source code in a readable manner with the use of control flow and methods.

Keep this application because you need to expand it in week 6 for calculating network segments.

Paste source code here, with a screenshot of a working application.



```java
import java.util.Scanner;

public class BitCalculations {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int choice;

        do {
            System.out.println("=== Bit Calculations Menu ===");
            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 number?");
            System.out.println("4. Exit");
            System.out.print("Enter your choice: ");
            choice = scanner.nextInt();

            if (choice >= 1 && choice <= 3) {
                System.out.print("Enter a number: ");
                int number = scanner.nextInt();

                if (choice == 1) {
                    if ((number & 1) == 1)
                        System.out.println(number + " is odd");
                    else
                        System.out.println(number + " is even");

                } else if (choice == 2) {
                    if (number > 0 && (number & (number - 1)) == 0)
                        System.out.println(number + " is a power of 2");
                    else
                        System.out.println(number + " isn't a power of 2");

                } else if (choice == 3) {
                    int result = ~number + 1;
                    System.out.println("Two's complement of " + number + "
is " + result);
                }
            }
        } while (choice != 4);

        System.out.println("doei!");
        scanner.close();
    }
}
```

Ready? Then save this file and export it as a pdf file with the name: **week2.pdf**