# Template Week 2 – Logic

Student number: 544483

**Assignment 2.1: Parking lot**

Which gates do you need?

AND

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 |
| 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 |
| 1 | 0 | 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

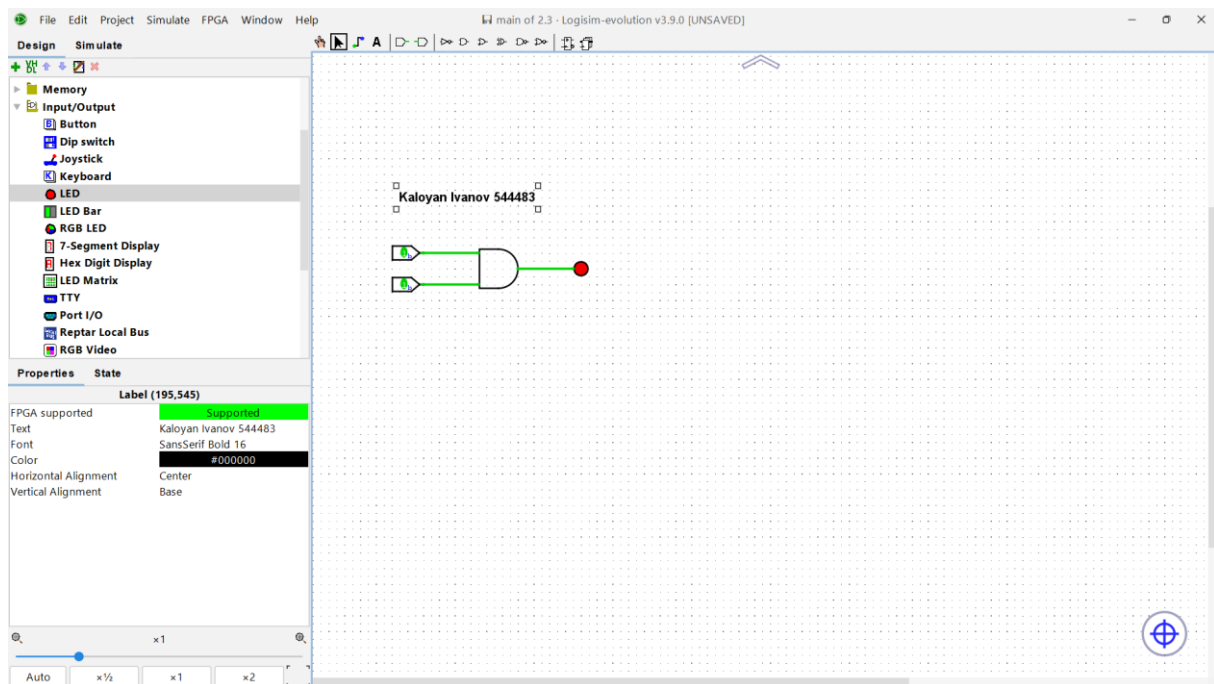| A | B | Q |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

How can the design be simplified?
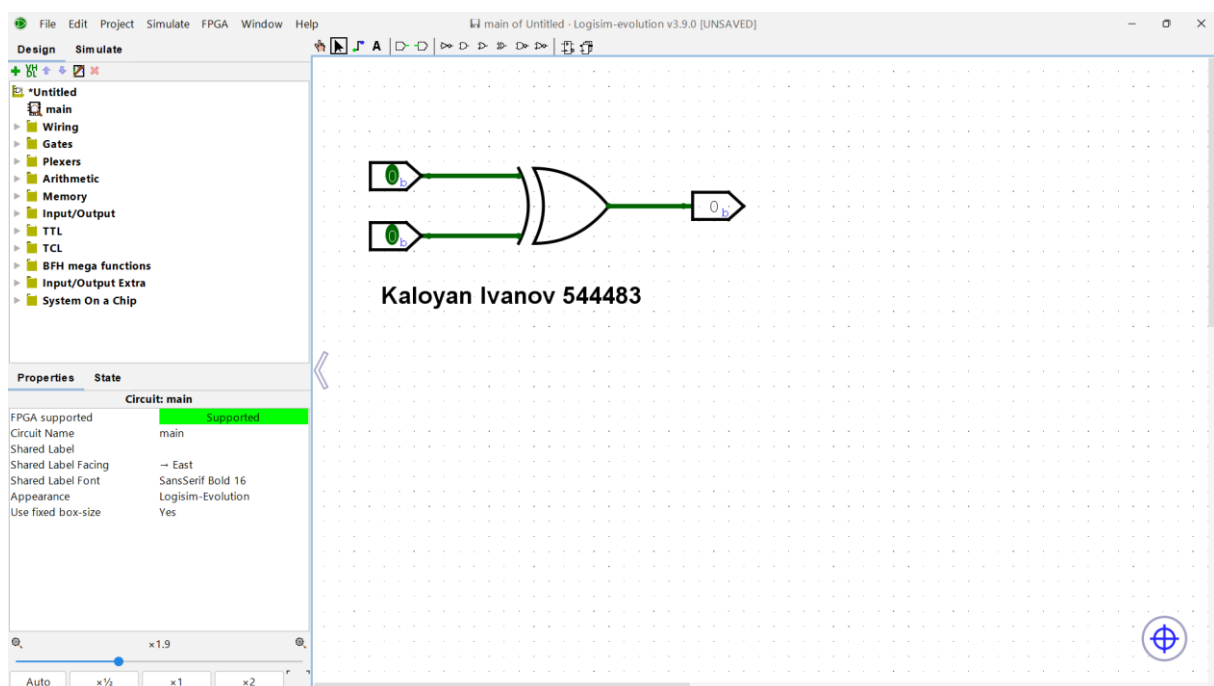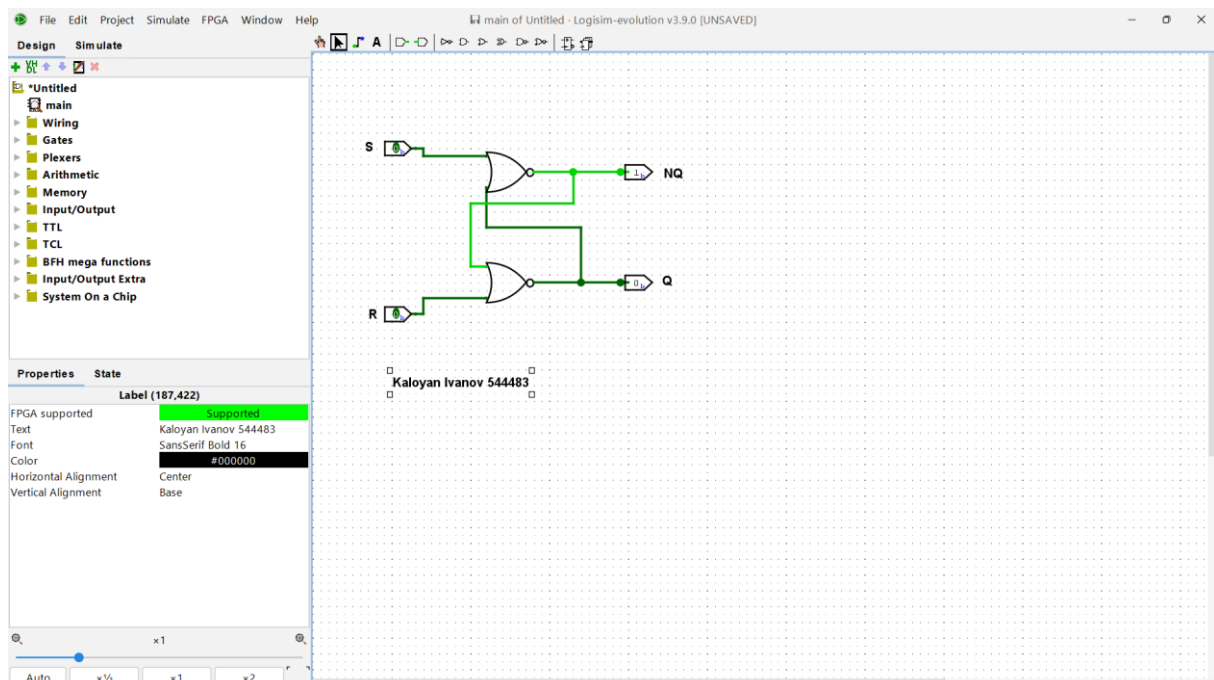


Change to XOR

**Assignment 2.4: Getting to know Logisim evolution**

Screenshot of the design with your name and student number in it:
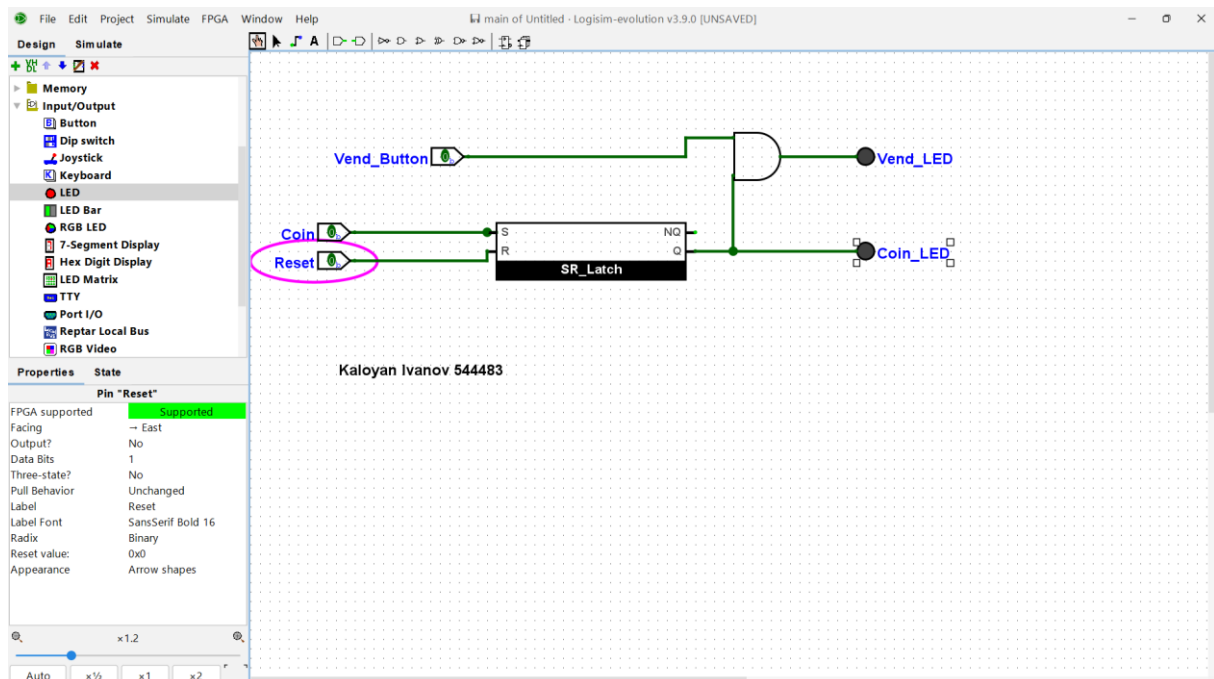
## Assignment 2.5: SR Latch

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:

Kaloyan Ivanov 544483

**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?

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.

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

```java
import nl.saxion.app.SaxionApp;

import java.awt.*;

public class Application implements Runnable { // There is a green button to the left of the
word "public". Click here!
```

```java
public static void main(String[] args) {
    SaxionApp.start(new Application(), 750, 750);
}

public void run() {
    //Kaloyan Ivanov St.№544483
    boolean running = true;
    while (running) {
        SaxionApp.printLine("Chose one option: ");
        SaxionApp.printLine("(1) Determines if number is even or odd");
        SaxionApp.printLine("(2) Determines if number power of two or not");
        SaxionApp.printLine("(3) Two's compliment of a number");
        SaxionApp.printLine("(4) Exit");
        int input = SaxionApp.readInt();
        if (input == 1) {
            SaxionApp.print("Chose a number: ");
            int i1 = SaxionApp.readInt();
            isItEvenOrOdd(i1);
        } else if (input == 2) {
            SaxionApp.print("Chose a number: ");
            int i2 = SaxionApp.readInt();
            isItPowerOfTwo(i2);
        } else if (input == 3) {
            SaxionApp.print("Chose a number: ");
            int i3 = SaxionApp.readInt();
            twosComplimentOfNumber(i3);
        } else if (input == 4) {
            SaxionApp.printLine("Goodbye!", Color.GREEN);
            running = false;
        } else {
            SaxionApp.printLine("Please provide a valid choice!", Color.red);
        }
        SaxionApp.pause();
        SaxionApp.clear();
    }
    System.exit(0);
}


public void isItEvenOrOdd(int number) {
    if ((number & 1) == 1) SaxionApp.printLine("number is odd");
    else SaxionApp.printLine("number is even");
}

public void isItPowerOfTwo(int number) {
    if ((number & number - 1) == 0) SaxionApp.printLine("number is a power of 2");
    else SaxionApp.printLine("number isn't a power of 2");
```

```java
    }


    public void twosComplimentOfNumber(int number) {
        number = ~number + 1;
        SaxionApp.printLine("Number: " + number);
    }
}
```

(1)

2)



(3)



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