

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

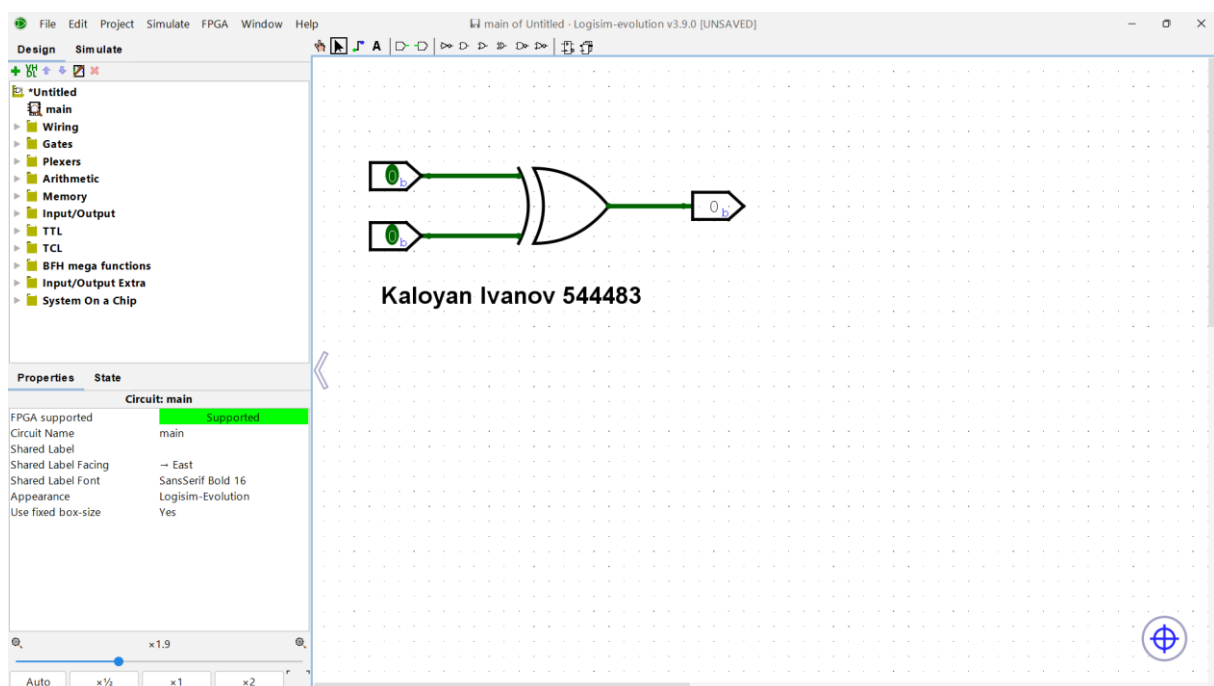
Android phone	iPhone	Result (Phone in possession)
0	0	0
0	1	1
1	0	1
1	1	0

Assignment 2.3: Four NAND gates

Complete this table

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

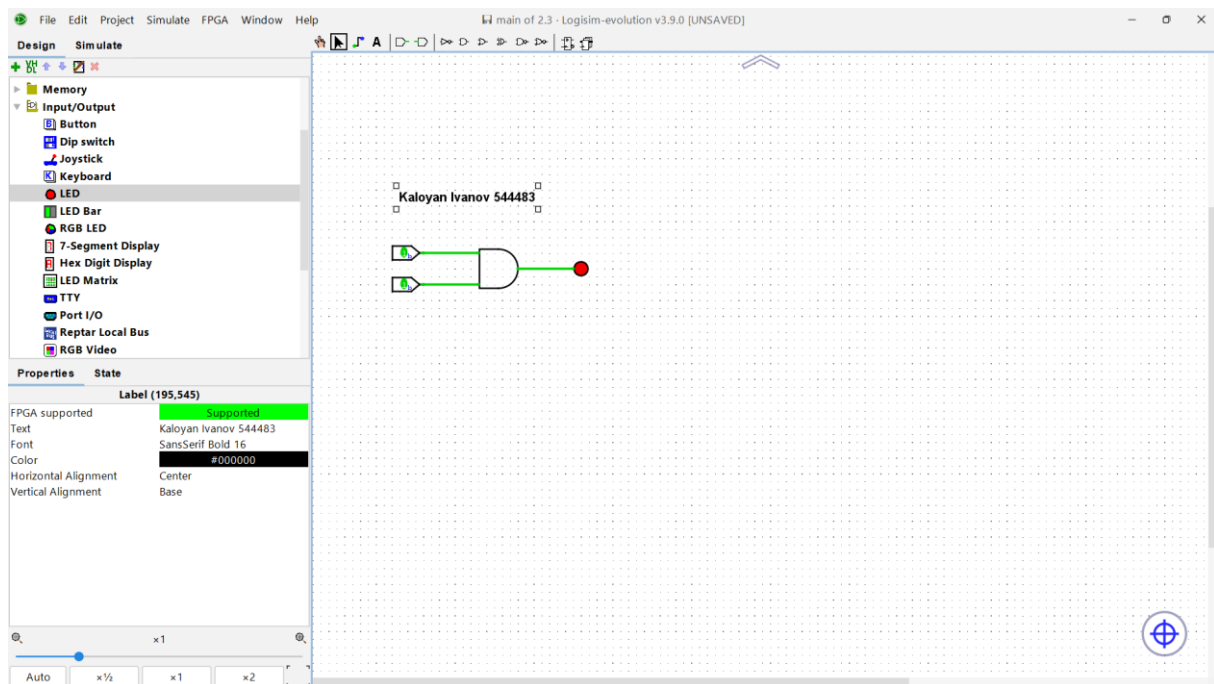
How can the design be simplified?



Change to XOR

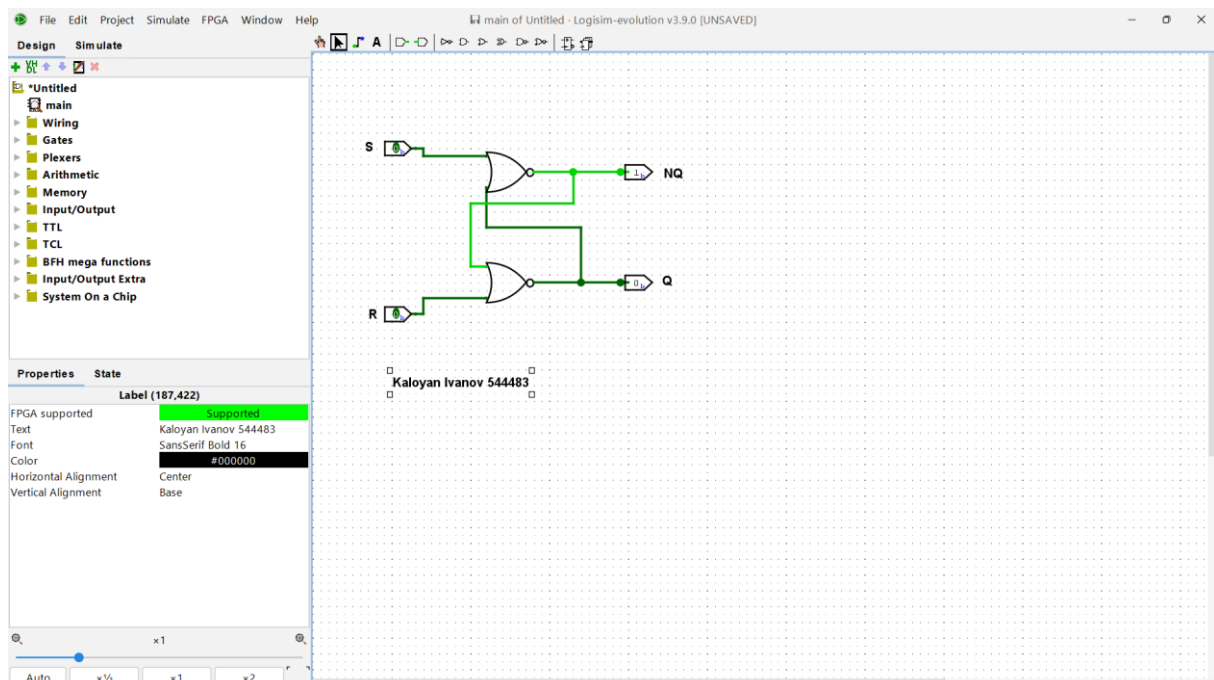
Assignment 2.4: Getting to know Logisim evolution

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



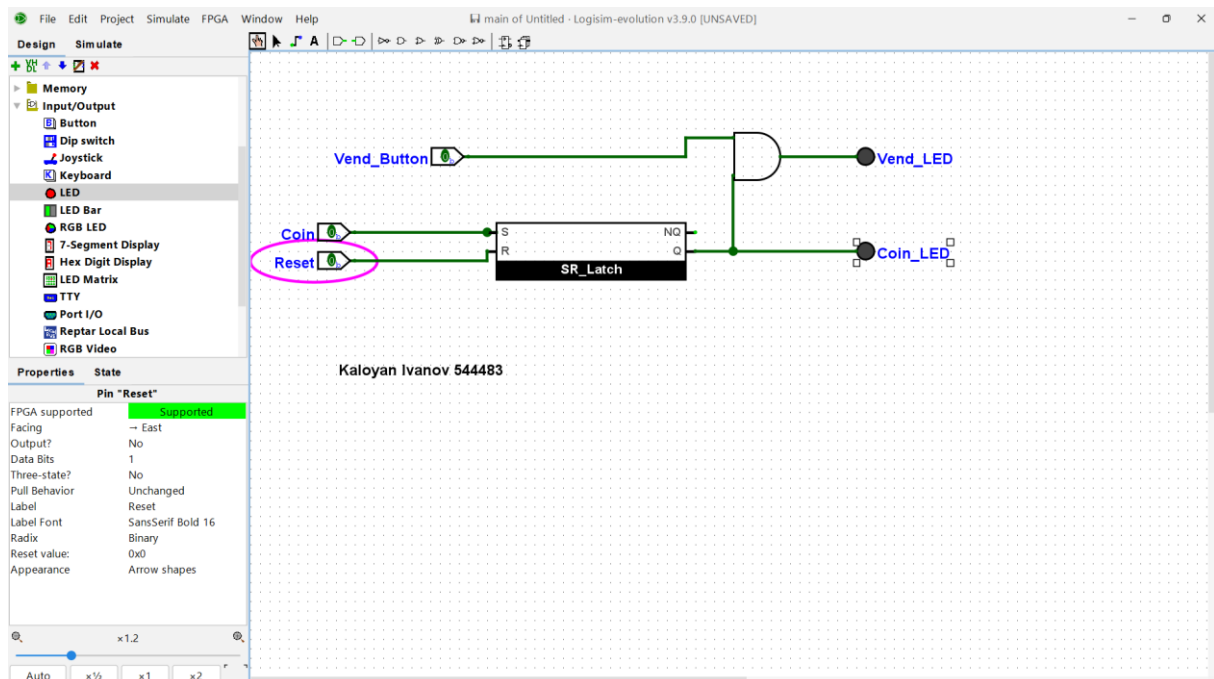
Assignment 2.5: SR Latch

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:



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.

```
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!
```

```

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.println("Chose one option: ");
        SaxionApp.println("(1) Determines if number is even or odd");
        SaxionApp.println("(2) Determines if number power of two or not");
        SaxionApp.println("(3) Two's compliment of a number");
        SaxionApp.println("(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.println("Goodbye!", Color.GREEN);
            running = false;
        } else {
            SaxionApp.println("Please provide a valid choice!", Color.red);
        }
        SaxionApp.pause();
        SaxionApp.clear();
    }
    System.exit(0);
}

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

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

```

```

    }

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

```

(1)

The screenshot shows an IDE with two panes. The left pane displays the output of a Java application, and the right pane shows the source code of the `Application.java` file.

Application Output (Left Pane):

```

Chose one option:
(1) Determines if number is even or odd
(2) Determines if number power of two or not
(3) Two's compliment of a number
(4) Exit
1
Chose a number: 2
number is even

```

Source Code (Right Pane):

```

Application.java
...
void main(String[] args) { SaxionApp.start(new Application(), width: 750, height: 750); }

...

in() {
    running = true;
    running() {
        App.println( text: "Chose one option: ");
        App.println( text: "(1) Determines if number is even or odd");
        App.println( text: "(2) Determines if number power of two or not");
        App.println( text: "(3) Two's compliment of a number");
        App.println( text: "(4) Exit");
        input = SaxionApp.readInt();
        input == 1) {
            SaxionApp.print("Chose a number: ");
            int i1 = SaxionApp.readInt();
            ItEvenOrOdd(i1);
        } if (input == 2) {
            SaxionApp.print("Chose a number: ");
        }
    }
}

```

2)

```
Chose one option:
(1) Determines if number is even or odd
(2) Determines if number power of two or not
(3) Two's compliment of a number
(4) Exit
2
Chose a number: 256
number is a power of 2

PRESS ANY KEY TO CONTINUE
```

```
Application.java
...
cation implements Runnable { // There is a green button to the left of the word "public".
...
void main(String[] args) { SaxionApp.start(new Application(), width: 750, height: 750); }

in() {
    innig = true;
    innig) {
        App.println(text: "Chose one option: ");
        App.println(text: "(1) Determines if number is even or odd");
        App.println(text: "(2) Determines if number power of two or not");
        App.println(text: "(3) Two's compliment of a number");
        App.println(text: "(4) Exit");
        put = SaxionApp.readInt();
        put == 1) {
            xionApp.print("Chose a number: ");
            t 11 = SaxionApp.readInt();
            ItEvenOrOdd(11);
        } if (input == 2) {
            xionApp.print("Chose a number: ");
        }
    }
}
```

(3)

```
Chose one option:
(1) Determines if number is even or odd
(2) Determines if number power of two or not
(3) Two's compliment of a number
(4) Exit
3
Chose a number: -10
Number: 10

PRESS ANY KEY TO CONTINUE
```

```
Application.java
...
cation implements Runnable { // There is a green button to the left of the word "public".
...
void main(String[] args) { SaxionApp.start(new Application(), width: 750, height: 750); }

in() {
    innig = true;
    innig) {
        App.println(text: "Chose one option: ");
        App.println(text: "(1) Determines if number is even or odd");
        App.println(text: "(2) Determines if number power of two or not");
        App.println(text: "(3) Two's compliment of a number");
        App.println(text: "(4) Exit");
        put = SaxionApp.readInt();
        put == 1) {
            xionApp.print("Chose a number: ");
            t 11 = SaxionApp.readInt();
            ItEvenOrOdd(11);
        } if (input == 2) {
            xionApp.print("Chose a number: ");
        }
    }
}
```

Ready? Then save this file and export it as a pdf file with the name: [week2.pdf](#)