Template Week 2 – Logic

Student number: 568681

Assignment 2.1: Parking lot

Which gates do you need?

For this assignment the OR logic gates are needed.

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/iPhone

Which gates do you need?

For this assignment we have to use the XOR gate

Complete this table

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

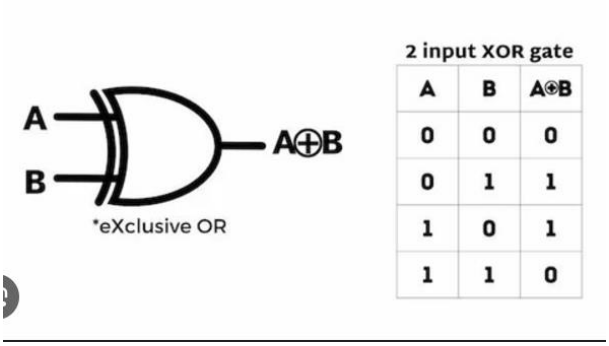
Assignment 2.3: Four NAND gates

Complete this table

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

How can the design be simplified?

This design can be simplified using an XOR Gate

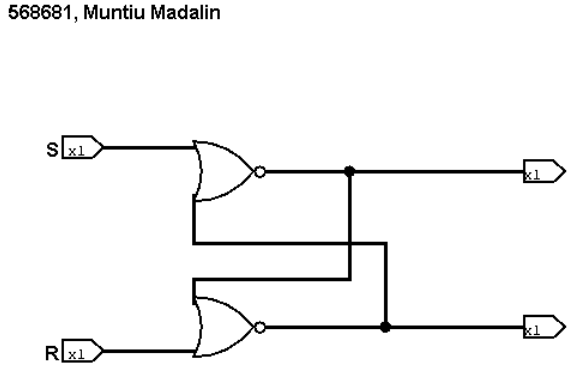


Assignment 2.4: Getting to know Logisim evolution

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 java.util.Scanner;

public class Main {
   public static void main(String[] args) {
      new Main().run();
   }

   public void run() {

      // 568681, Muntiu Madalin
      Scanner scanner = new Scanner(System.in);
      int number;
      System.out.println("Enter a number: ");
      number = scanner.nextInt();
```

```
        isNumberOdd(number);
        powerOfTwo(number);
        complementNumber(number);
    }

    public void isNumberOdd(int number) {
        if ((number & 1) == 1) {
            System.out.println("The number is  odd");
        } else {
            System.out.println("The number is even");
        }
    }

    public void powerOfTwo(int number) {
        if ((number & (number - 1)) == 0) {
            System.out.println("The number is a power of 2");
        } else {
            System.out.println("The number is not a power of 2");
        }
    }

    public void complementNumber(int number) {
        System.out.println("Number: " + (~number + 1));
    }
}
```

```
Enter a number:
4
The number is even
The number is a power of 2
Number: -4
```

```
Enter a number:
5
The number is  odd
The number is not a power of 2
Number: -5
```

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