Template Week 2 – Logic

Student number: 588991

Assignment 2.1: Parking lot

Which gates do you need?

2 AND 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
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Assignment 2.2: Android or iPhone

Which gates do you need?

XOR gate

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

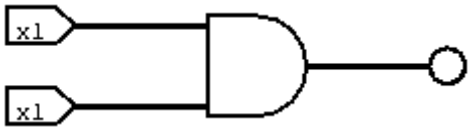
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

Gebruik maken van een XOR gate.

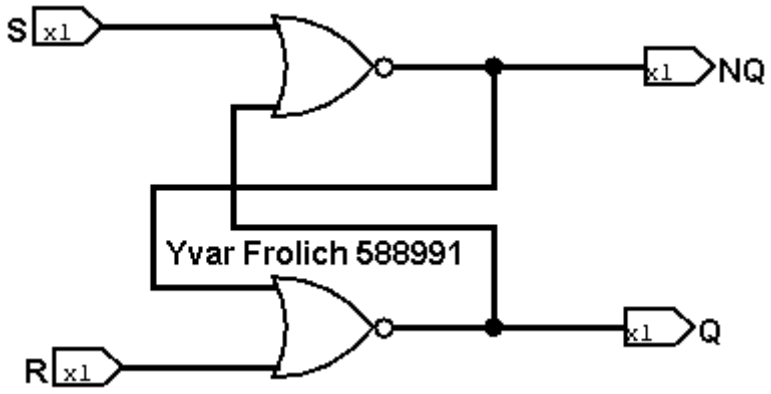
Assignment 2.4: Getting to know Logisim evolution

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



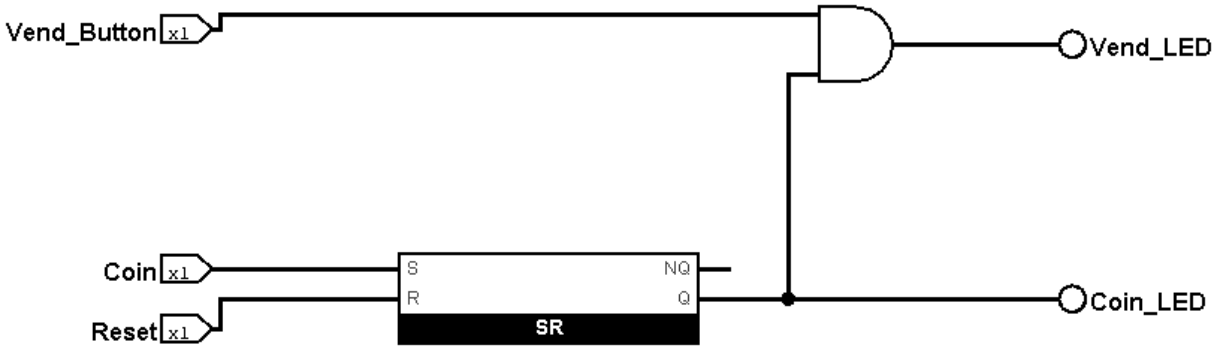
Assignment 2.5: SR Latch

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:



Assignment 2.7: Bitwise operators

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

```
public static void main(String[] args) {
   //int number = 5;
   //if((number & 1) == 1) System.out.println("number is odd");
   //else System.out.println("number is even");

   //int number = 4;

   //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");


   //final int READ = 4;
   //final int WRITE = 2;
   //final int EXECUTE = 1;
   //int userPermissions = 7;
   //if(READ + WRITE + EXECUTE == userPermissions) System.out.println("User has read
permissions");
   //else System.out.println("User can't read. No permissions.");
```

```
    //final int READ = 4;
    //final int WRITE = 2;
    //final int EXECUTE = 1;

    //int userPermissions = 0;

    //userPermissions = userPermissions | READ | EXECUTE;

    //System.out.println("User permissions: " + userPermissions);


    //final int READ = 4;
    //final int WRITE = 2;
    //final int EXECUTE = 1;

    //int userPermissions = 6;

    //userPermissions = userPermissions ^ WRITE;

    //System.out.println("User permissions: " + userPermissions);


    //int number = 5;
    //number = ~number + 1;
    //System.out.println(number);

    //number = ~number + 1;
    //System.out.println(number);
}
```

Assignment 2.8: Java Application Bit Calculations

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

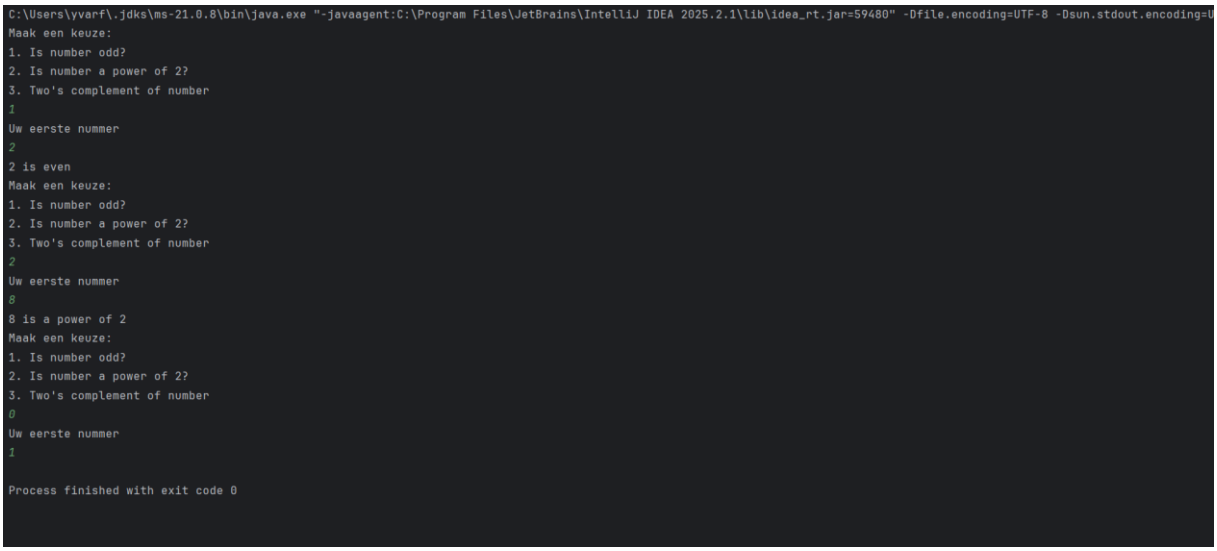
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number?

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.




```
import java.util.Scanner;

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

        int selection = -1;
        int firstNumber = 0;

        do {
            System.out.println("Maak een keuze:");
            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");

            selection = scanner.nextInt();

            if (selection != 0) {
                System.out.println("Uw getal");
                firstNumber = scanner.nextInt();
            }

            if (selection == 1){
                isNumberOdd(firstNumber);
            } else if (selection == 2) {
                isNumberpowerOf2(firstNumber);
            } else if (selection == 3){
                isComplementofNumber(firstNumber);
            } else {

            }
```

```
        } while (selection != 0);
    }

    public static void isNumberOdd(int firstNumber) {
        System.out.println(firstNumber + " is " + ((firstNumber & 1) == 1 ? "odd" : "even"));
    }

    public static void isNumberpowerOf2(int firstNumber) {
        System.out.println(firstNumber + " is " + ((firstNumber > 0 && (firstNumber & (firstNumber - 1))
== 0) ? "" : "not ") + "a power of 2");
    }

    public static void isComplementofNumber(int firstNumber) {
        int complementFirst = ~firstNumber + 1;
        System.out.println("Two's complement of " + firstNumber + " is " + complementFirst);
    }
}
```

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