

Template Week 2 – Logic

Student number: 588898

Assignment 2.1: Parking lot

Which gates do you need?

3 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
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?

AND gate en 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

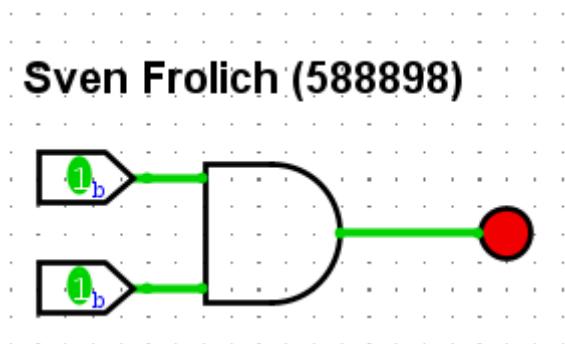
A	B	Q
0	0	0
1	0	1
0	1	1
1	1	0

How can the design be simplified?

Een XOR-gate in plaats van vier NAND gates

Assignment 2.4: Getting to know Logisim evolution

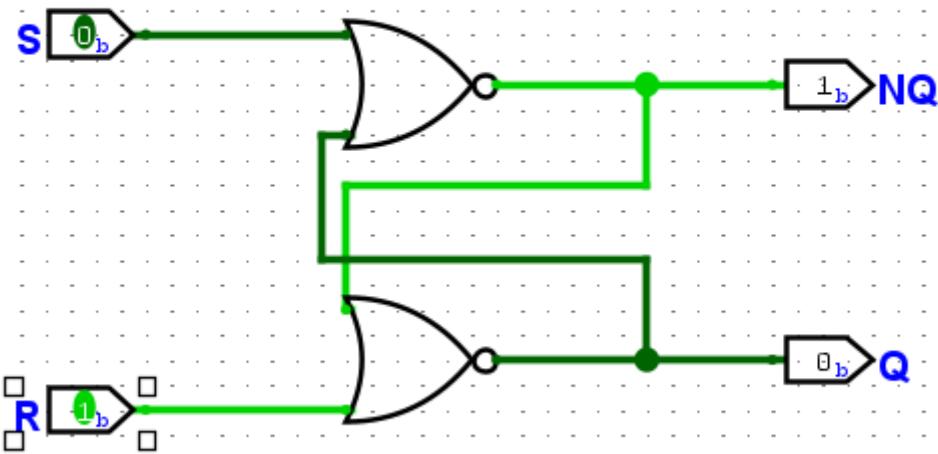
Screenshot of the design with your name and student number in it:



Assignment 2.5: SR Latch

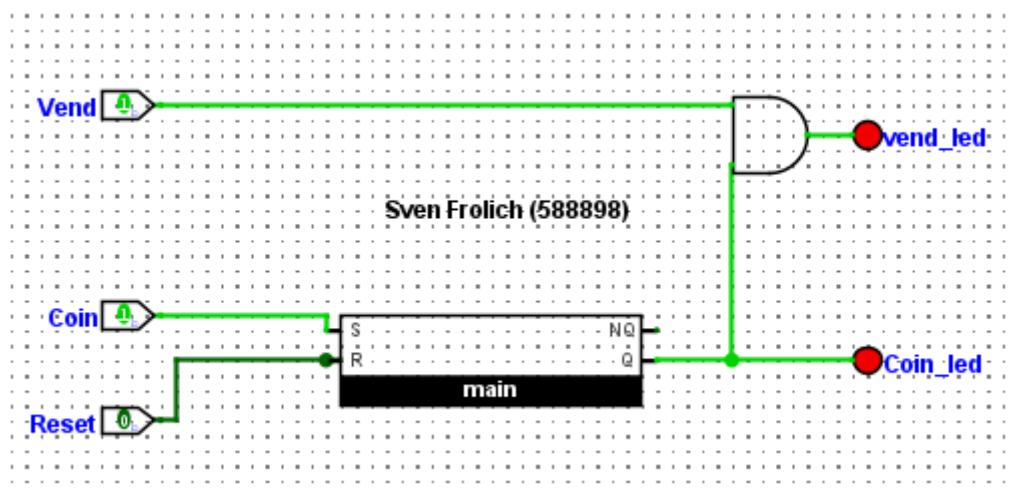
Screenshot SR Latch in Logisim with your name and student number:

Sven Frolich (588898)



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 = 2;  
        if((number & 1)==1) System.out.println("number is odd");  
        else System.out.println("number is even");  
    }  
}
```

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.

```
public class Main {  
    public static void main(String[] args) {  
        int number = 10;  
        int keuze = 3; // keuze 1 2 of 3  
        if (keuze == 1) {  
            if ((number & 1) == 1)  
                System.out.println("getal is oneven");  
            else  
                System.out.println("getal is even");  
        }  
        if (keuze == 2) {  
            if (number > 0 && (number & (number - 1)) == 0)  
                System.out.println("getal is een macht van 2");  
            else  
                System.out.println("getal is geen macht van 2");  
        }  
  
        if (keuze == 3) {  
            int twos = ~number + 1;  
            System.out.println("two's complement is: " + twos);  
        }  
    }  
}
```

```
}
```

The screenshot shows the IntelliJ IDEA interface. On the left is the Project tool window with a tree view of the 'test' project containing '.idea', 'out', 'src' (with 'Main' selected), '.gitignore', and 'test.iml'. The right side has two tabs: 'Main.java' and 'Run'. The 'Main.java' tab displays the following Java code:

```
1 public class Main {
2     public static void main(String[] args) {
3         int number = 11;
4         int keuze = 2; // keuze 1 2 of 3
5         if (keuze == 1) {
6             if ((number & 1) == 1)
7                 System.out.println("getal is oneven");
8             else
9                 System.out.println("getal is even");
10        }
11
12        if (keuze == 2) {
13            if (number > 0 && (number & (number - 1)) == 0)
14                System.out.println("getal is een macht van 2");
15            else
16                System.out.println("getal is geen macht van 2");
17        }
18
19        if (keuze == 3) {
```

The 'Run' tab shows the output of the program:

```
C:\Users\Gebruiker\.jdks\ms-21.0.8\bin\java.exe "-javaagent:C:\Users\Gebruiker\AppData\Local\Programs\IntelliJ IDEA Community Edition 2025.2.1\lib\idea_rt.jar" -Dfile.encoding=UTF-8
getal is een macht van 2

Process finished with exit code 0
```

This screenshot is identical to the one above, showing the IntelliJ IDEA interface with the 'Main.java' code and its execution output.

The 'Main.java' code is the same as in the first screenshot:

```
1 public class Main {
2     public static void main(String[] args) {
3         int number = 12;
4         int keuze = 3; // keuze 1 2 of 3
5         if (keuze == 1) {
6             if ((number & 1) == 1)
7                 System.out.println("getal is oneven");
8             else
9                 System.out.println("getal is even");
10        }
11
12        if (keuze == 2) {
13            if (number > 0 && (number & (number - 1)) == 0)
14                System.out.println("getal is een macht van 2");
15            else
16                System.out.println("getal is geen macht van 2");
17        }
18
19        if (keuze == 3) {
```

The 'Run' tab shows the output:

```
C:\Users\Gebruiker\.jdks\ms-21.0.8\bin\java.exe "-javaagent:C:\Users\Gebruiker\AppData\Local\Programs\IntelliJ IDEA Community Edition 2025.2.1\lib\idea_rt.jar" -Dfile.encoding=UTF-8
two's complement is: -12

Process finished with exit code 0
```

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