Template Week 2 – Logic

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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
1	0	0	0
1	1	0	0
1	0	1	0
0	1	1	0
1	1	1	0

Assignment 2.2: Android or iPhone

Which gates do you need?

XOR

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

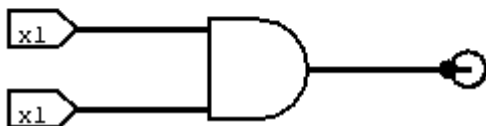| A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?
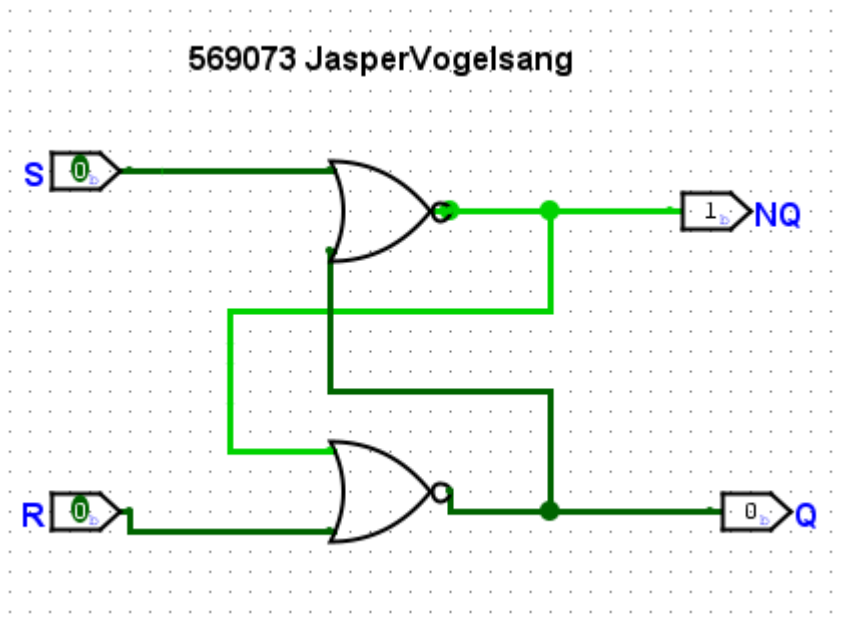
Met een XOR gate

Assignment 2.4: Getting to know Logisim evolution

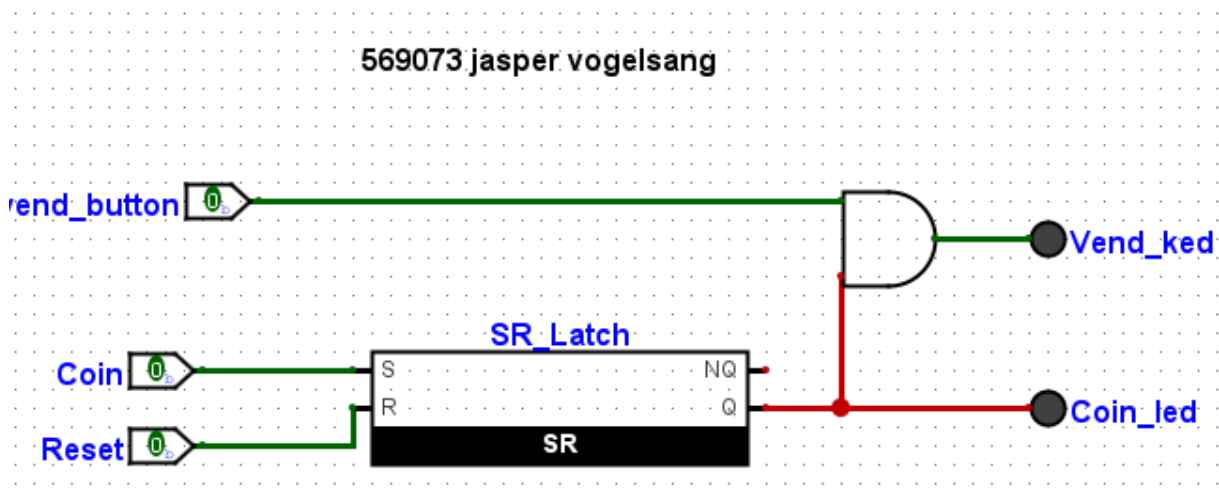Screenshot of the design with your name and student number in it:

Assignment 2.5: SR Latch

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

569073 JasperVogelsang

S ▢0
NQ 1
R ▢0
Q 0

Assignment 2.6: Vending Machine

Screenshot Vending Machine in Logisim with your name and student number:

569073 jasper vogelsang

vend_button ▢0

Coin ▢0

Reset ▢0

SR_Latch
S   NQ
R   Q
SR

Vend_ked

Coin_led

Assignment 2.7: Bitwise operators

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

#1

```java
public class Main {

 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");}

 }
}
```

#2

```java
public class Main {
   public static void main(String[] args) {
      int number = 15;
      if(((number & 1)!=1)) System.out.println("number is a power of 2");
      else System.out.println("number isn't a power of 2");
      int number2 = 15;
      if(((number2 & 1)!=1)) System.out.println("number2 is a power of 2");
      else System.out.println("number2 isn't a power of 2");
   }
}
```

#3

```
public class Main {
    public static void main(String[] args) {
        final int READ = 4;
        final int WRITE = 2;
        final int EXECUTE = 1;

        int userPermissions = 7;

        if ((userPermissions & 4)== 4 ) {
            System.out.println("User has read permissions");
        } else {
            System.out.println("User can't read. No permissions.");
        }
    }
}
```

#4

```
public class Main {
    public static void main(String[] args) {
        final int READ = 4;
        final int WRITE = 2;
        final int EXECUTE = 1;

        int userPermissions = 0;

        userPermissions = userPermissions | READ;
        userPermissions = userPermissions | EXECUTE;
        System.out.println("User permissions: "+userPermissions);

    }
}
```

#5

```
public class Main {
    public static void main(String[] args) {
        final int READ = 4;
        final int WRITE = 2;
        final int EXECUTE = 1;

        int userPermissions = 6;
        userPermissions = userPermissions ^ WRITE;
        System.out.println("User permissions: "+userPermissions);

    }
}
```

#6

```
public class Main {
    public static void main(String[] args) {
        int number = 5;
        number = ~number + 1;
        System.out.println("Number: "+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.

```
Saxion Drawingboard

1 is number odd
2 is number power of 2
3 two compliments numbers
4 stop
3
12
-12
```



```
Saxion Drawingboard

1 is number odd
2 is number power of 2
3 two compliments numbers
4 stop
1
5
number is odd
```



```
Saxion Drawingboard

1 is number odd
2 is number power of 2
3 two compliments numbers
4 stop
2
8
number is a power of 2
```

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

public class Main implements Runnable {

    public static void main(String[] args) {
        SaxionApp.start(new Main(), 800, 768);
    }

    public void run() {
        while (true) {
            SaxionApp.clear();
```

```java
        SaxionApp.printLine("1 is number odd");
        SaxionApp.printLine("2 is number power of 2");
        SaxionApp.printLine("3 two compliments numbers");
        SaxionApp.printLine("4 stop");
        int input = SaxionApp.readInt();
        if (input == 1) {
            int numberOddOrEven = SaxionApp.readInt();
            if ((numberOddOrEven & 1) == 1) {
                SaxionApp.printLine("number is odd");
                SaxionApp.pause();
            } else { SaxionApp.printLine("number is even");
                SaxionApp.pause();

            }
        } else if (input == 2) {
            int number = SaxionApp.readInt();
            if (((number & 1) != 1)) {
                SaxionApp.printLine("number is a power of 2");
                SaxionApp.pause();
            } else {
                SaxionApp.printLine("number isn't a power of 2");
                SaxionApp.pause();
            }


        } else if (input == 3) {
            int number = SaxionApp.readInt();
            number = ~number + 1;
            SaxionApp.printLine(number);
            SaxionApp.pause();

        } else if (input == 4) {
            break;
        }
    }
  }
}
```

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