Template Week 2 – Logic

Student number: 589671

Assignment 2.1: Parking lot

Which gates do you need?

And Gate

Sensor1 AND Sensor2 AND Sensor3

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 or iPhone

Which gates do you need?

XOR

Er mag maar 1 waar zijn

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

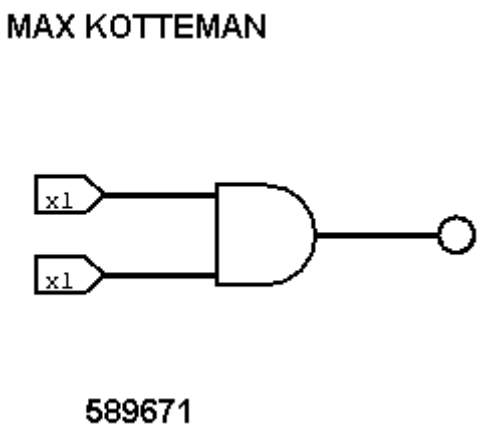
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

Dit is precies hetzelfde als een XOR GATE

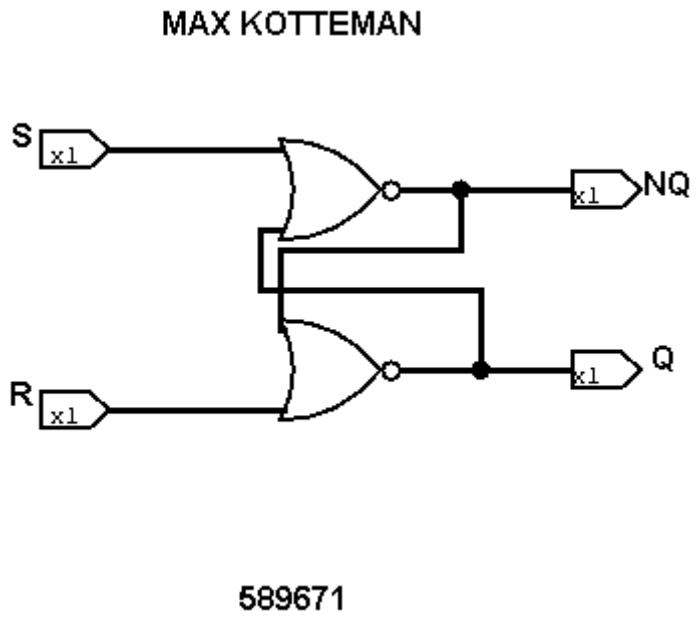
Assignment 2.4: Getting to know Logisim evolution

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



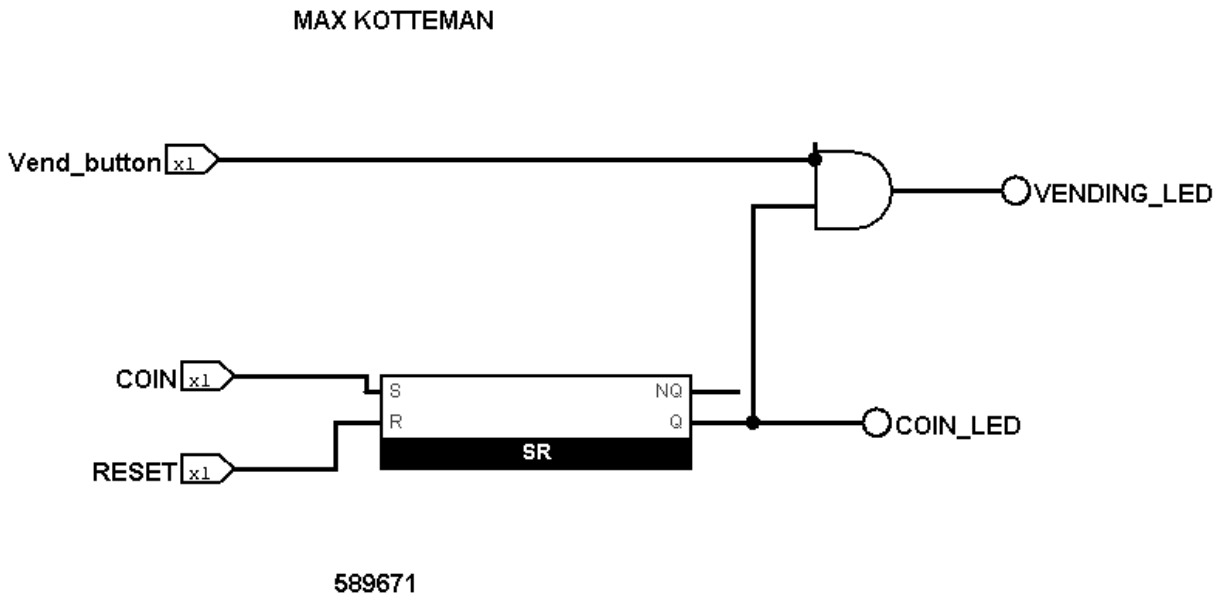
Assignment 2.5: SR Latch

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.

1. Even of Oneven

```
if((nummerr & 1) == 0){
   System.out.println("HET NUMMER IS EVEN");
} else {
   System.out.println("HET NUMMER IS ONEVEN");
}
```

```
if ((n & (n - 1)) == 0 && n > 0){
   System.out.println("DIT IS EEN MACHT VAN 2");
} else {
   System.out.println("DIT IS GEEN MACHT VAN 2");
}
```

```
int nummer = 10;

   int negatief = ~nummer + 1;

   int positief = ~negatief + 1;

   System.out.println("Origineel: " + nummer);
   System.out.println("Negatief): " + negatief);
   System.out.println("Positief: " + positief);
}
```

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 Application implements Runnable {

   public static void main(String[] args) {
      SaxionApp.start(new Application());
   }

   public void run() {
      boolean blijfgaan = true;
      while (blijfgaan) {
         int gekozenSelectie = printmenu();
         String gekozenSelectieString = String.valueOf(gekozenSelectie);
         switch (gekozenSelectieString) {
            case "1":
               option1();
               break;
            case "2":
               option2();
               break;
            case "3":
               option3();
               break;
         }
         SaxionApp.printLine("SELECTEER 0 OM TERUG TE GAAN");
         int teruggaan = SaxionApp.readInt();
         if (teruggaan != 0) {
            blijfgaan = false;
         }
      }
      SaxionApp.print("SYSTEEM BEEINDIGD");
   }
   public int printmenu(){
      SaxionApp.printLine("1. EVEN OF ONEVEN BEREKENEN");
      SaxionApp.printLine("2. MACHT VAN 2 UITREKENEN");
      SaxionApp.printLine("3. TWO COMPLEMENT UITREKENEN");
      int selection = SaxionApp.readInt();
      return selection;
   }
   public void option1(){
      SaxionApp.printLine("KIES EEN GETAL: ");
```

```
        int gekozennummer = SaxionApp.readInt();

        if ((gekozennummer & 1) == 0) {
            SaxionApp.printLine("HET NUMMER IS EVEN");
        } else {
            SaxionApp.printLine("HET NUMMER IS ONEVEN");
        }

    }
    public void option2(){
        SaxionApp.printLine("KIES EEN GETAL: ");
        int gekozennummer = SaxionApp.readInt();

        if ((gekozennummer & (gekozennummer - 1)) == 0 && gekozennummer > 0) {
            SaxionApp.printLine("DIT IS EEN MACHT VAN 2");
        } else {
            SaxionApp.printLine ("DIT IS GEEN MACHT VAN 2");
        }
    }
    public void option3(){
        SaxionApp.print("KIES EEN GETAL: ");
        int gekozennummer = SaxionApp.readInt();

        int negatief = ~gekozennummer + 1;

        int positief = ~negatief + 1;

        SaxionApp.printLine("Origineel: " + gekozennummer);
        SaxionApp.printLine("Negatief): " + negatief);
        SaxionApp.printLine("Positief: " + positief);
    }

}
```

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