Template Week 2 – Logic

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Assignment 2.1: Parking lot

Which gates do you need?

2x AND gate

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?

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
1	0	1
0	1	1
1	1	0

How can the design be simplified?

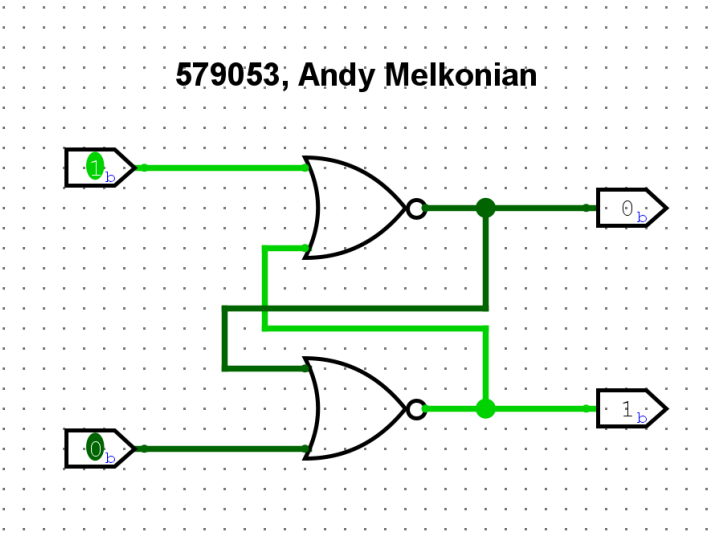
Using 1 XOR gate

Assignment 2.4: Getting to know Logisim evolution

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

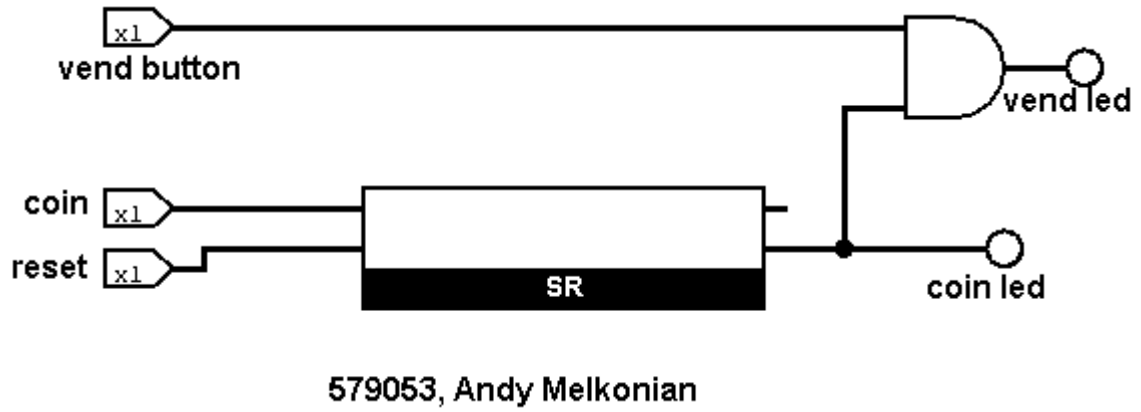
Assignment 2.5: SR Latch

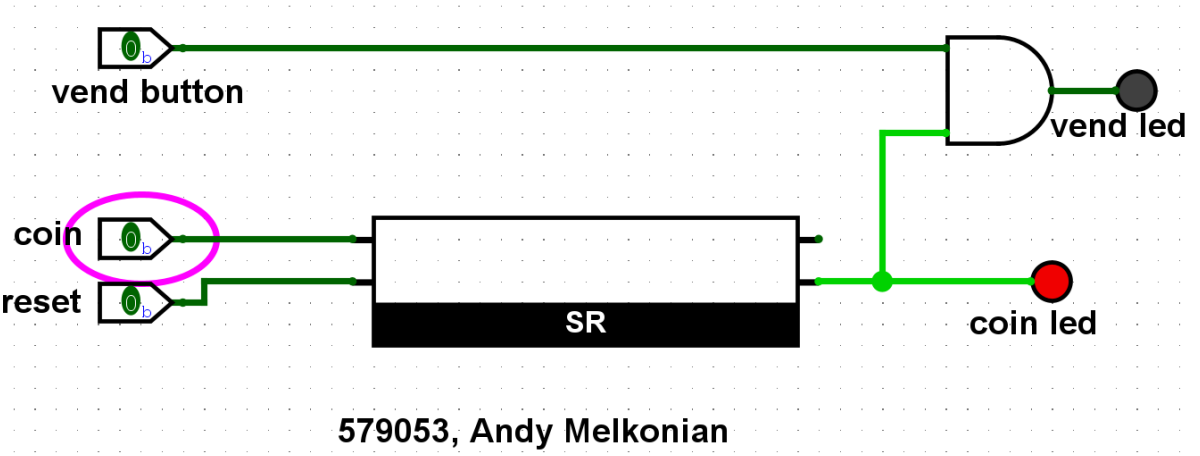
Screenshot SR Latch in Logisim with your name and student number:



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 class Main {
    public static void main(String[] args) {
        int number = 9;

        if ((number & 1) == 0){
            System.out.println("number is even");
        } else{
            System.out.println("number is odd");
        }
    }
}
```

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.

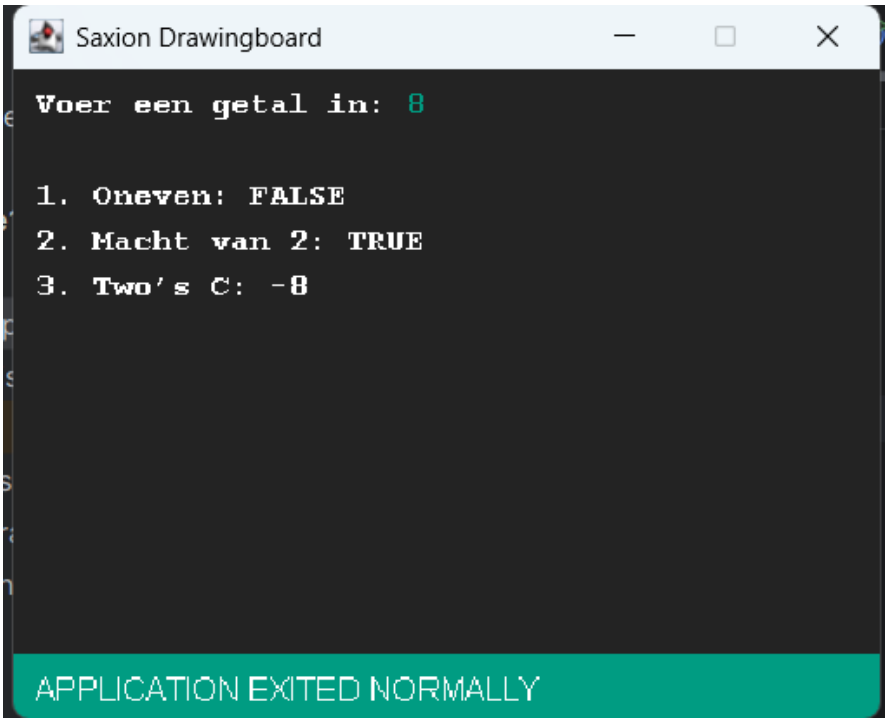
Organize your source code in a readable manner with the use of control flow and methods.

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 nl.saxion.app.SaxionApp;

import java.awt.*;

public class Application implements Runnable {

    public static void main(String[] args) {
        SaxionApp.start(new Application(), 400, 300);
    }

    private boolean isOdd(int n) {
        return (n & 1) != 0;
    }

    private boolean isPowerOfTwo(int n) {
        return n > 0 && (n & (n - 1)) == 0;
    }

    private int getTwosComplement(int n) {
        return (~n) + 1;
    }

    public void run() {
        SaxionApp.print("Voer een integer in: ");
        int number = SaxionApp.readInt();

        SaxionApp.printLine();

        String oddResult;
        if (isOdd(number)) {
            oddResult = "TRUE";
        } else {
            oddResult = "FALSE";
        }
        SaxionApp.printLine("1. Oneven: " + oddResult);

        String powerOfTwoResult;
```

```
        if (isPowerOfTwo(number)) {
            powerOfTwoResult = "TRUE";
        } else {
            powerOfTwoResult = "FALSE";
        }
        SaxionApp.printLine("2. Macht van 2: " + powerOfTwoResult);

        int complement = getTwosComplement(number);
        SaxionApp.printLine("3. Two's C: " + complement);
    }
}
```



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