

# Template Week 2 – Logic

Student number: 568670

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## Assignment 2.1: Parking lot

Which gates do you need?

**Answer:** 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/iPhone

Which gates do you need?

An XOR port

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

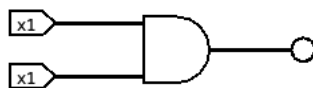
How can the design be simplified?

**Answer :** With just and XOR gate.

### Assignment 2.4: Getting to know Logisim evolution

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

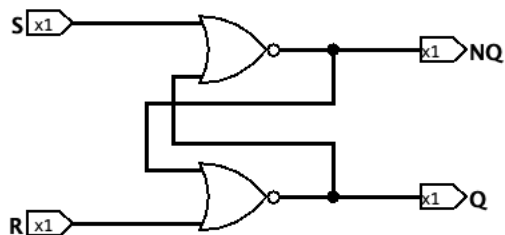
**568670**



### Assignment 2.5: SR Latch

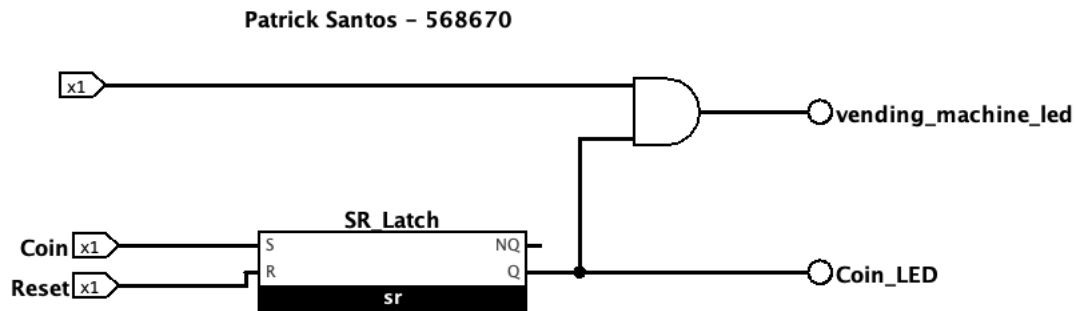
Screenshot SR Latch in Logisim with your name and student number:

**Patrick Santos - 568670**



## Assignment 2.6: Vending Machine

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



## Bonus point assignment – week 2

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

1. Is number odd?  
vv
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.

Paste source code here, with a screenshot of a working application.

```

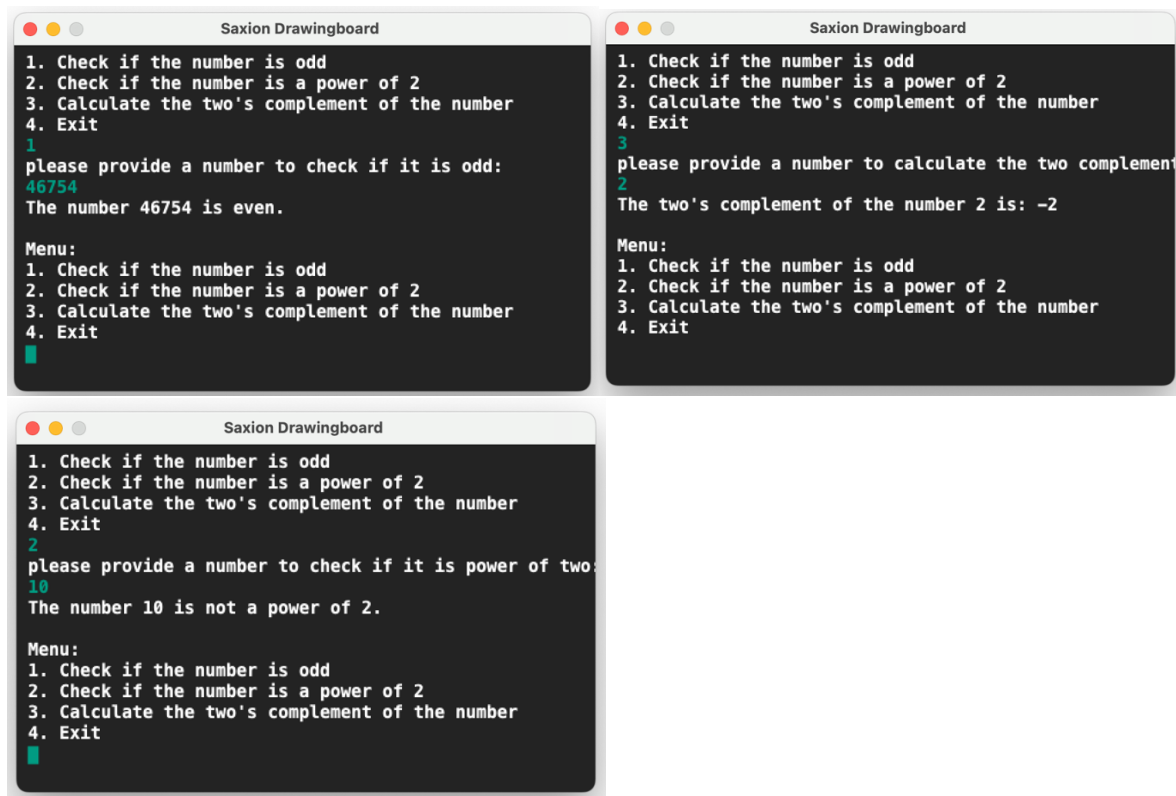
Application.java x
1  import nl.saxion.app.SaxionApp;
2
3  public class Application implements Runnable {
4
5      public static void main(String[] args) {
6          SaxionApp.start(new Application(), width: 500, height: 300);
7      }
8
9      public void run() {
10         SaxionApp.println( text: "Welcome! Please choose one of the options below:");
11
12         boolean exit = false;
13
14         while (!exit) {
15             // Display the menu options
16             SaxionApp.println( text: "\nMenu:");
17             SaxionApp.println( text: "1. Check if the number is odd");
18             SaxionApp.println( text: "2. Check if the number is a power of 2");
19             SaxionApp.println( text: "3. Calculate the two's complement of the number");
20             SaxionApp.println( text: "4. Exit");
21             int choice = SaxionApp.readInt( alternativeErrorMessage: "Choose an option:");
22
23             // Process the user's choice
24             switch (choice) {
25                 case 1 -> checkOdd();
26                 case 2 -> checkPowerOfTwo();
27                 case 3 -> calculateTwosComplement();
28                 case 4 -> {
29                     SaxionApp.println( text: "Exiting the program...");
30                     exit = true;
31                 }
32                 default -> SaxionApp.println( text: "Invalid option. Please try again.");
33             }
34         }
35     }
36

```

```

37     private void checkOdd() { 1 usage
38         SaxionApp.println( text: "please provide a number to check if it is odd: ");
39         int number = SaxionApp.readInt( alternativeErrorMessage: "Enter a number:");
40         if ((number & 1) == 1) {
41             SaxionApp.println( text: "The number " + number + " is odd.");
42         } else {
43             SaxionApp.println( text: "The number " + number + " is even.");
44         }
45     }
46
47     private void checkPowerOfTwo() { 1 usage
48         SaxionApp.println( text: "please provide a number to check if it is power of two: ");
49         int number = SaxionApp.readInt( alternativeErrorMessage: "Enter a number:");
50         if (number > 0 && (number & (number - 1)) == 0) {
51             SaxionApp.println( text: "The number " + number + " is a power of 2.");
52         } else {
53             SaxionApp.println( text: "The number " + number + " is not a power of 2.");
54         }
55     }
56
57     private void calculateTwosComplement() { 1 usage
58         SaxionApp.println( text: "please provide a number to calculate the two complement: ");
59         int number = SaxionApp.readInt( alternativeErrorMessage: "Enter a number:");
60         int twosComplement = ~number + 1; // Calculate the two's complement
61         SaxionApp.println( text: "The two's complement of the number " + number + " is: " + twosComplement);
62     }
63 }
64

```



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