Template Week 2 – Logic

Student number: 575933

Assignment 2.1: Parking lot

Which gates do you need?

I need an and gate because the full result should only be true when lot 1 AND lot 2 AND lot3 is full

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/iPhone

Which gates do you need?

An exclusive or gate because an exclusive or gate will return false when both of them are the same, either true and true or false and false because in this case you can't choose both and you can't choose nothing

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

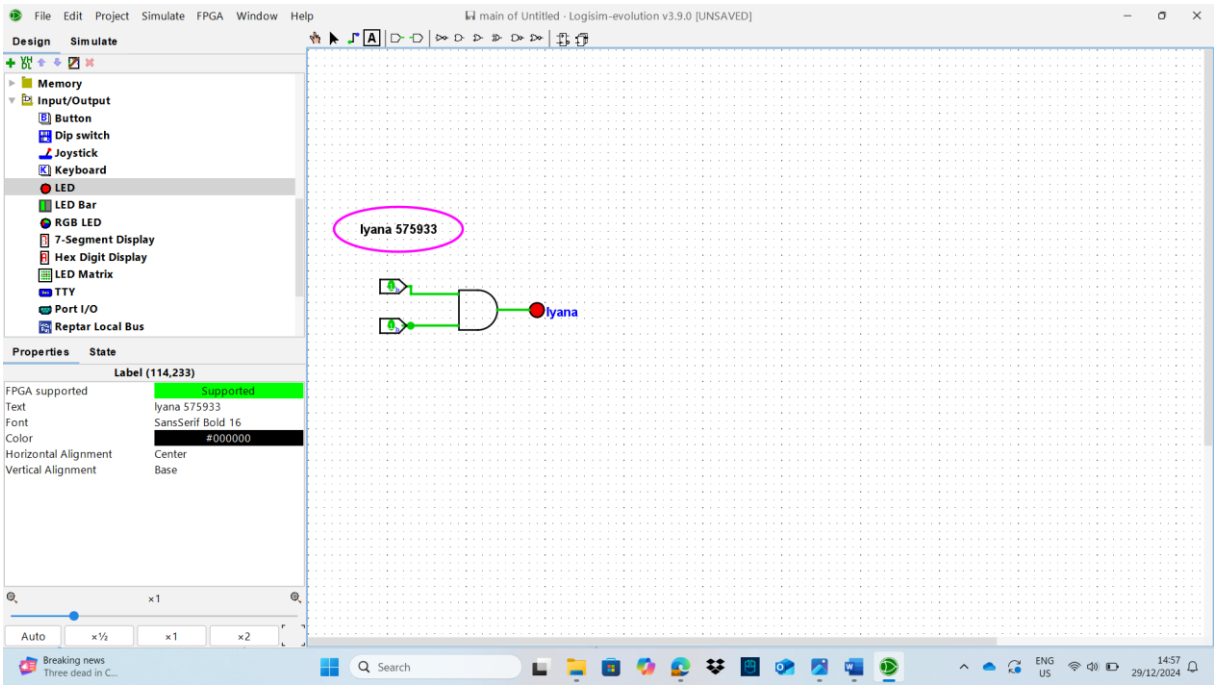
A	B	Q
0	0	1
0	1	1
1	0	1
1	1	0

How can the design be simplified?

The design can be simplified by using a single nand and not gate.

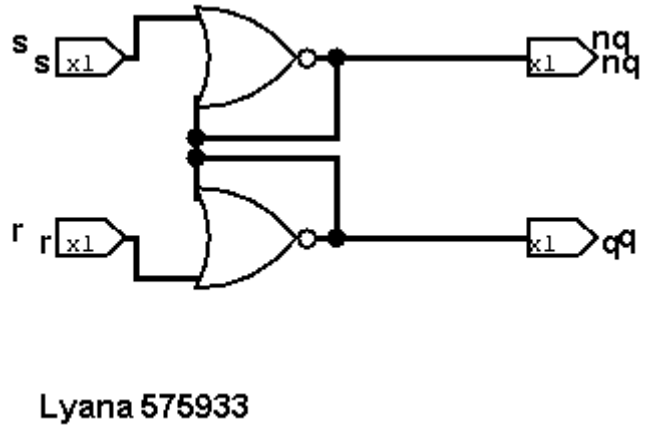
Assignment 2.4: Getting to know Logisim evolution

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



Assignment 2.5: SR Latch

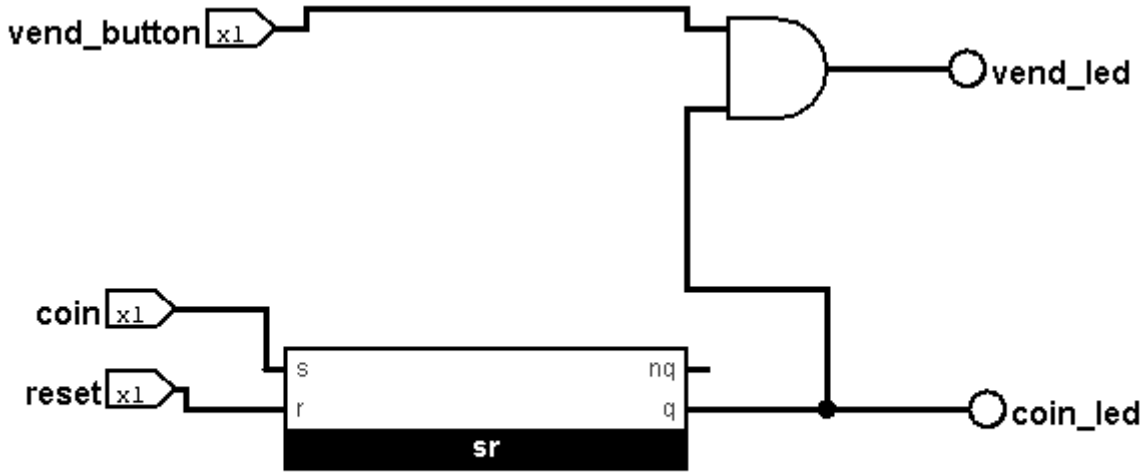
Screenshot SR Latch in Logisim with your name and student number:



Lyana 575933

Assignment 2.6: Vending Machine

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



Lyana 575933

Bonus point assignment – week 2

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?

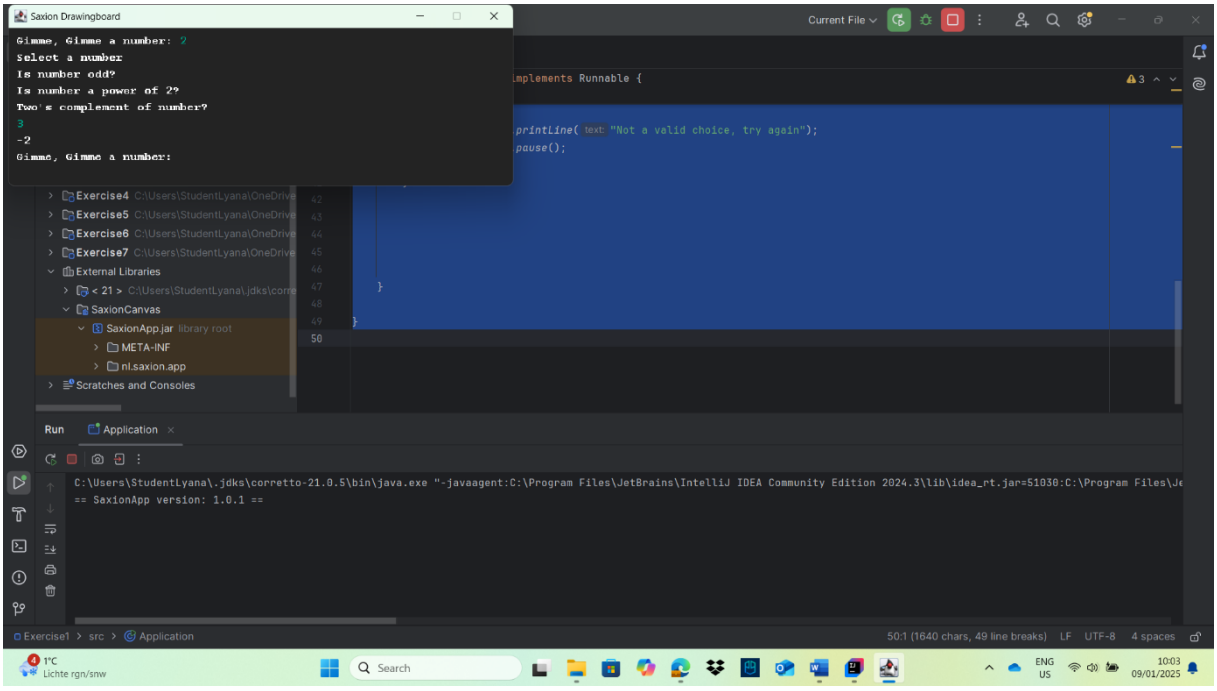
Implement the methods by using the bitwise operators you have just learned.

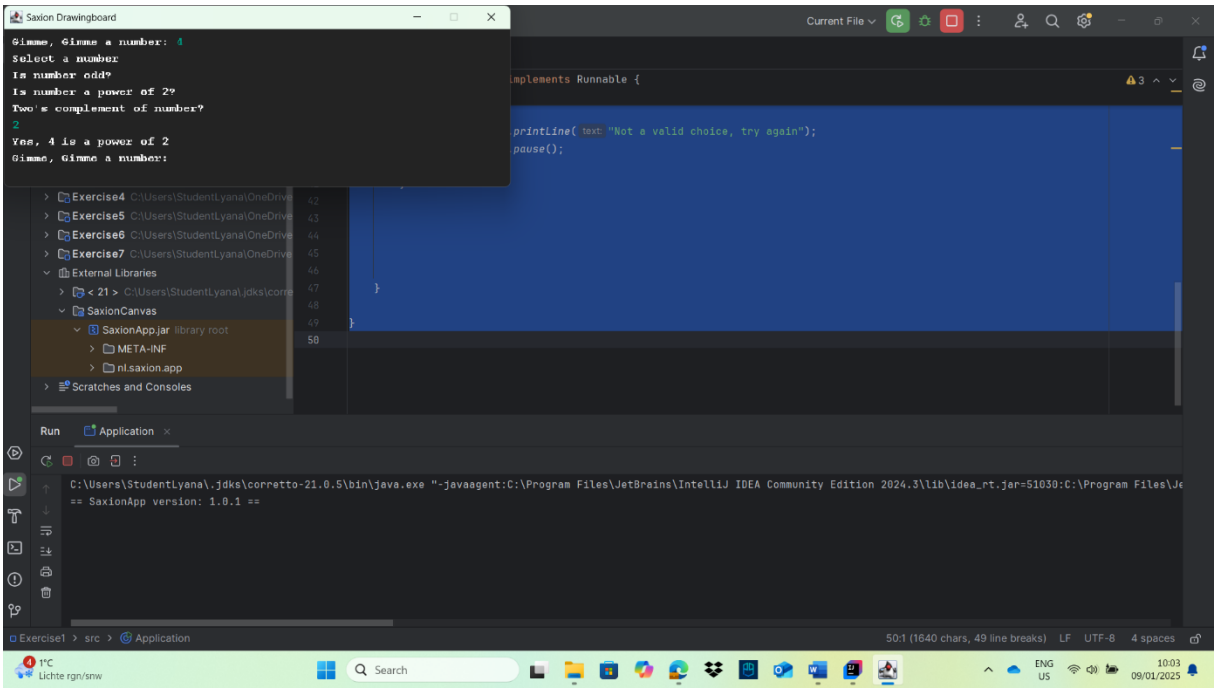
Organize your source code in a readable manner with the use of control flow and methods.

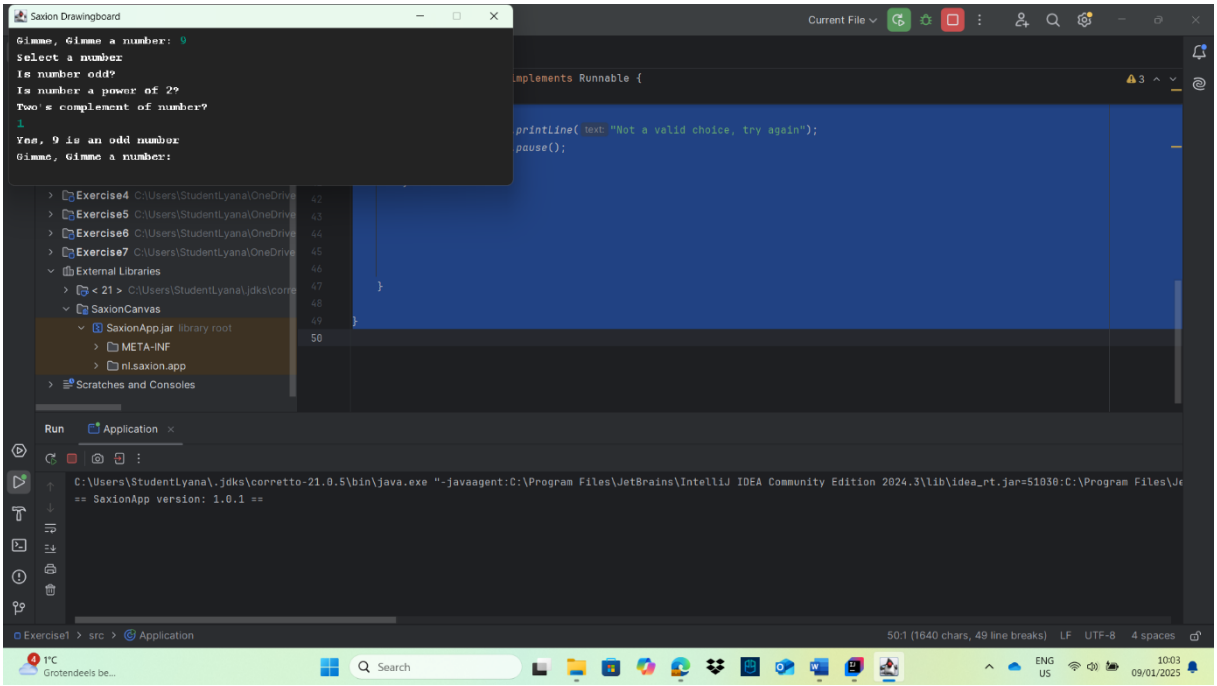
Paste source code here, with a screenshot of a working application.

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

import java.awt.*;

public class Application implements Runnable {

   public static void main(String[] args) {
      SaxionApp.start(new Application(), 640, 200 );
   }

   public void run() {
      SaxionApp.clear();
      boolean loop = true;
      while(loop) {
         SaxionApp.print("Gimme, Gimme a number: ");
         int number_given = SaxionApp.readInt();
         SaxionApp.printLine("Select a number");
         SaxionApp.printLine("Is number odd?");
         SaxionApp.printLine("Is number a power of 2?");
         SaxionApp.printLine("Two's complement of number?");
         int choice = SaxionApp.readInt();
         if (choice == 1) {
            if ((number_given & 1) == 1) {
               SaxionApp.printLine("Yes, " + number_given + " is an odd number");
            } else {
               SaxionApp.printLine("No, " + number_given + " is not an odd number");
            }
         } else if (choice == 2) {
            if (number_given > 0 && (number_given & (number_given - 1)) == 0) {
               SaxionApp.printLine("Yes, " + number_given + " is a power of 2");
```

```
            } else {
                SaxionApp.printLine("No, " + number_given + " is not a power of 2");
            }
        } else if (choice == 3) {
            int twosComplement = ~number_given + 1;
            SaxionApp.printLine(twosComplement);
        } else {
            SaxionApp.printLine("Not a valid choice, try again");
            SaxionApp.pause();
        }
    }


  }

}
```







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