Template Week 2 – Logic

Student number: 529471

Assignment 2.1: Parking lot

Which gates do you need?

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
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?

OR gate

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

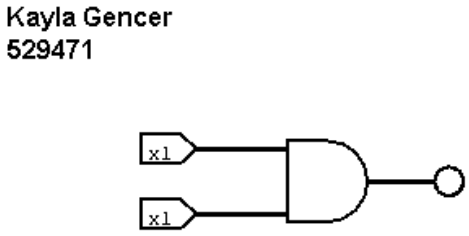
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

It can be simplified by using one XOR gate instead of four NAND gates, as the truth table represents a XOR gate's truth table in the end. Q is only true (1) when exactly one of its inputs is true (1).

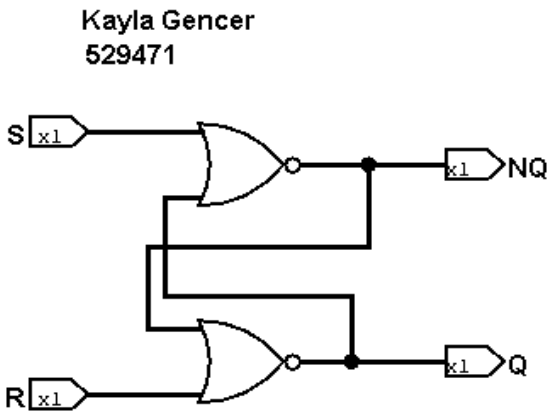
Assignment 2.4: Getting to know Logisim evolution

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



Assignment 2.5: SR Latch

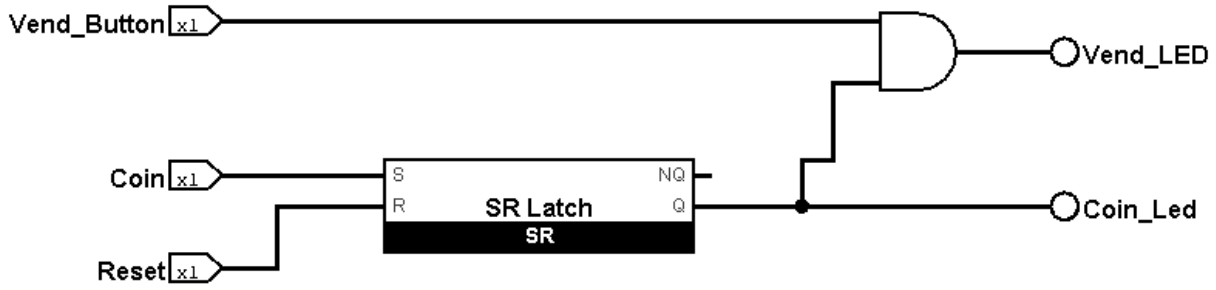
Screenshot SR Latch in Logisim with your name and student number:



Assignment 2.6: Vending Machine

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

Kayla Gencer
529471



Bonus point assignment – week 2

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

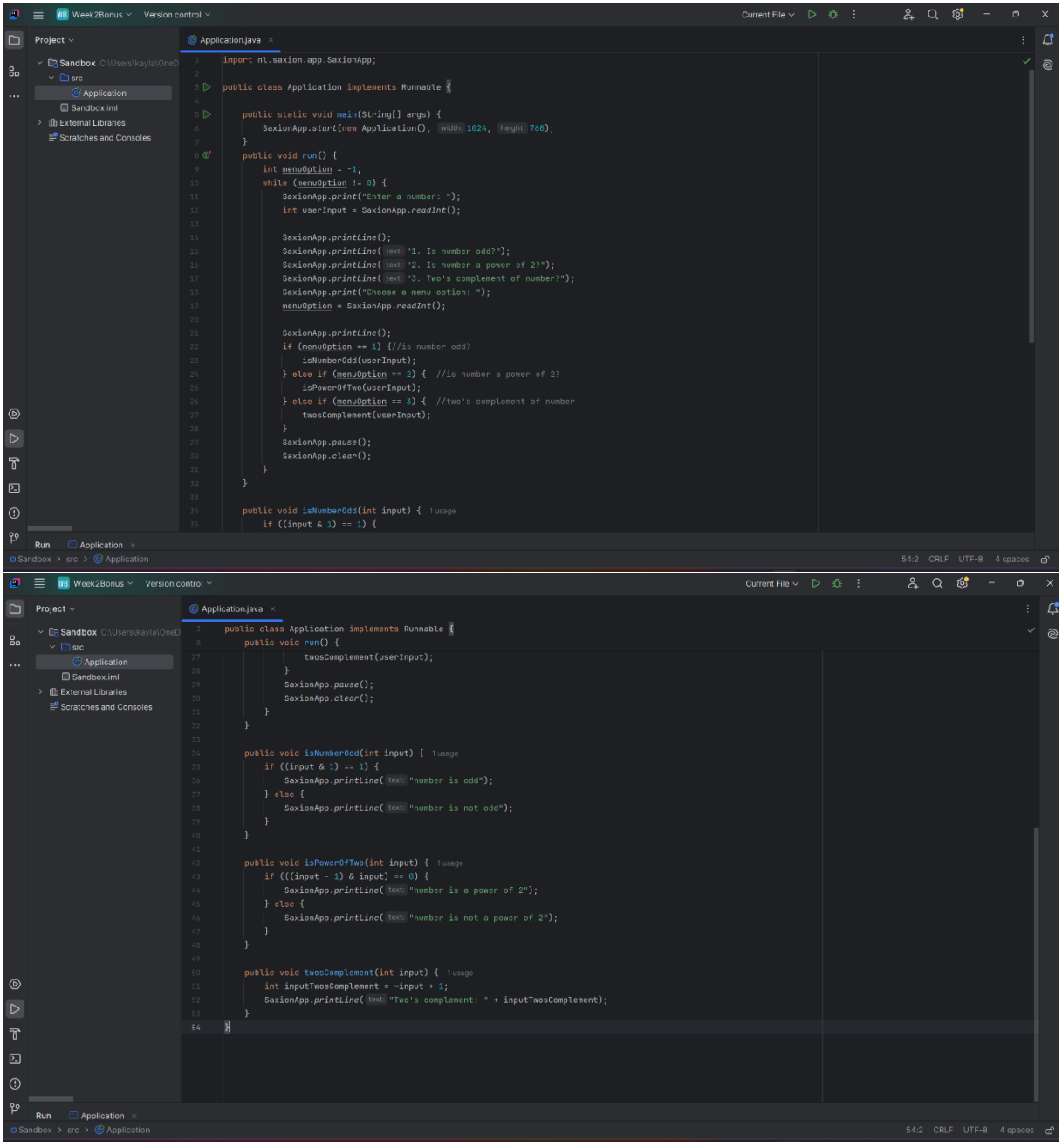
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number?

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.

Source Code:

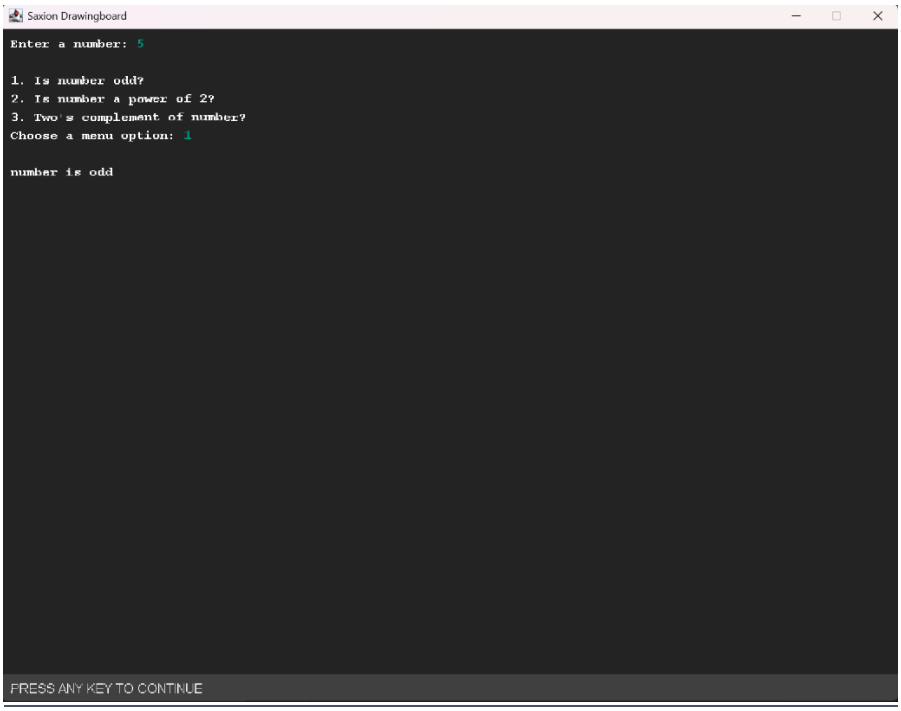


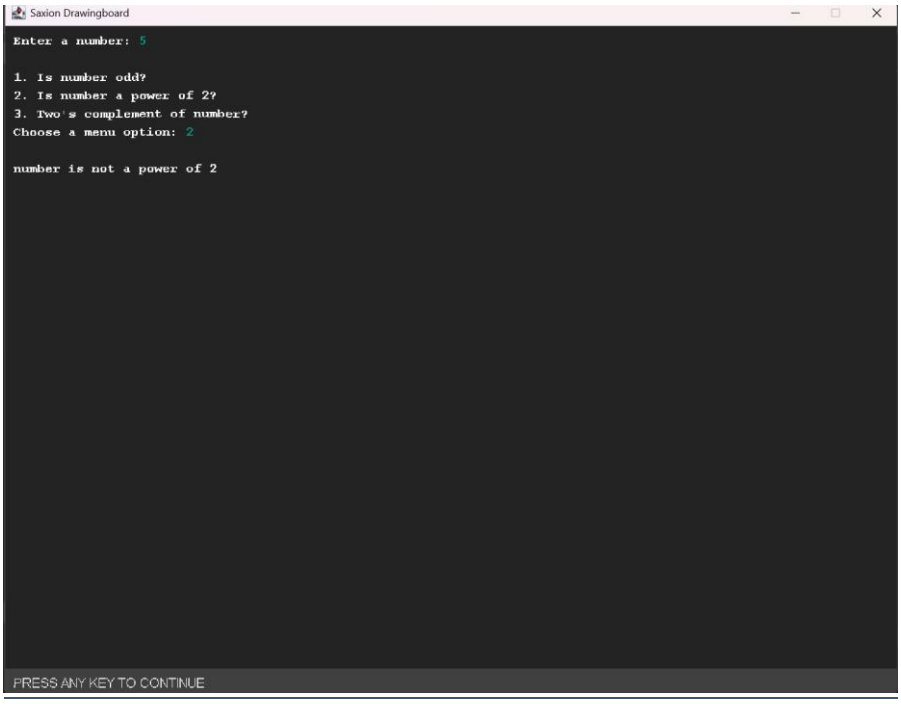
```java
import nl.saxion.app.SaxionApp;

public class Application implements Runnable {

    public static void main(String[] args) {
        SaxionApp.start(new Application(), width: 1024, height: 768);
    }
    public void run() {
        int menuOption = -1;
        while (menuOption != 0) {
            SaxionApp.print("Enter a number: ");
            int userInput = SaxionApp.readInt();

            SaxionApp.printLine();
            SaxionApp.printLine( text: "1. Is number odd?");
            SaxionApp.printLine( text: "2. Is number a power of 2?");
            SaxionApp.printLine( text: "3. Two's complement of number?");
            SaxionApp.print("Choose a menu option: ");
            menuOption = SaxionApp.readInt();

            SaxionApp.printLine();
            if (menuOption == 1) {//is number odd?
                isNumberOdd(userInput);
            } else if (menuOption == 2) {  //is number a power of 2?
                isPowerOfTwo(userInput);
            } else if (menuOption == 3) {  //two's complement of number
                twosComplement(userInput);
            }
            SaxionApp.pause();
            SaxionApp.clear();
        }
    }

    public void isNumberOdd(int input) {  1 usage
        if ((input & 1) == 1) {
```

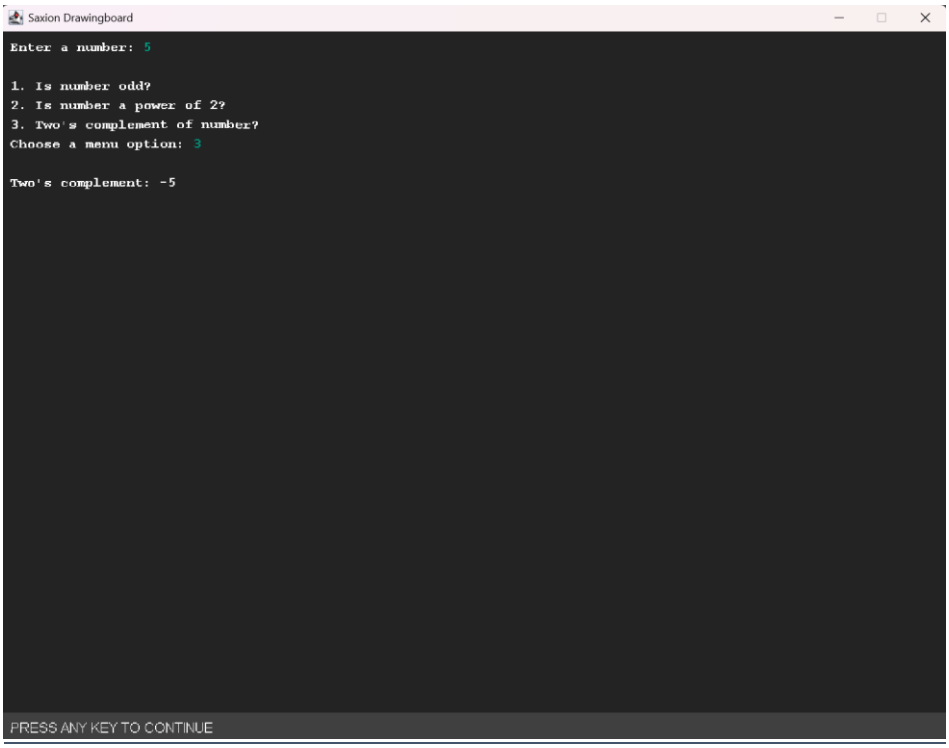


```java
    public class Application implements Runnable {
        public void run() {
                    twosComplement(userInput);
                }
                SaxionApp.pause();
                SaxionApp.clear();
            }
        }

        public void isNumberOdd(int input) {  1 usage
            if ((input & 1) == 1) {
                SaxionApp.printLine( text: "number is odd");
            } else {
                SaxionApp.printLine( text: "number is not odd");
            }
        }

        public void isPowerOfTwo(int input) {  1 usage
            if (((input - 1) & input) == 0) {
                SaxionApp.printLine( text: "number is a power of 2");
            } else {
                SaxionApp.printLine( text: "number is not a power of 2");
            }
        }

        public void twosComplement(int input) {  1 usage
            int inputTwosComplement = ~input + 1;
            SaxionApp.printLine( text: "Two's complement: " + inputTwosComplement);
        }
    }
```

Working Application







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