

Template Week 2 – Logic

Student number:

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
1	0	0	0
1	1	0	0
1	0	1	0
0	1	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
1	0	1
0	1	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

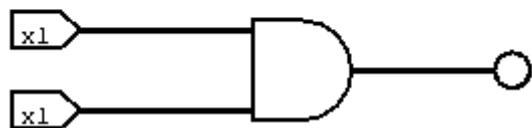
How can the design be simplified?

Using an xor gate

Assignment 2.4: Getting to know Logisim evolution

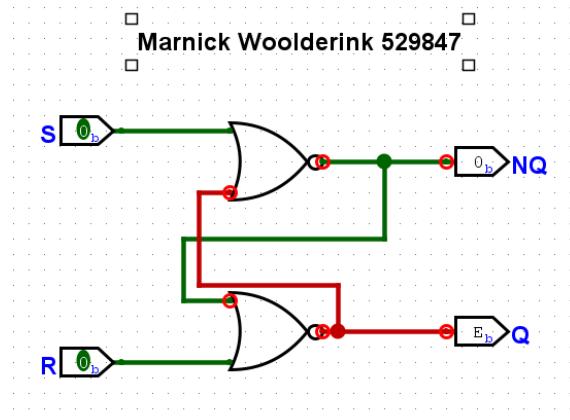
Screenshot of the design with your name and student number in it:

Marnick Woolderink 529847



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:

Marnick Woolderink 529847



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 = 5;  
        if((number & 1)==1) System.out.println("number is odd");  
        else System.out.println("number is even");  
  
    }  
}
```

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 java.util.Scanner;

public class Main {
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.print("Please input a number: ");
        int number = sc.nextInt();

        System.out.println("please select an option:");
        System.out.println("is this number even or odd");
        System.out.println("is this number a power of 2");
        System.out.println("this number in two's complement");

        int userChoice = sc.nextInt();

        switch (userChoice) {
            case 1: {
                if ((number & 1) == 1) System.out.println("number is odd");
                else System.out.println("number is even");
                break;
            }
            case 2: {
                if ((number & (number - 1)) == 0) System.out.println("number is a power of 2");
                else System.out.println("number isn't a power of 2");
                break;
            }
            case 3: {
                int twosComplement = (~number) + 1;
                String binary = Integer.toBinaryString(twosComplement);
                System.out.println("Two's complement (binary): " + binary);
                break;
            }
        }
    }
}
```

```
C:\Users\6marn\.jdks\ms-21.0.8\bin\java.exe "-javaagent:C:\Pr
Please input a number: 13
please select an option:
is this number even or odd
is this number a power of 2
this number in two's complement
3
Two's complement (binary): 11111111111111111111111111110011
Process finished with exit code 0
```

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