

Template Week 2 – Logic

Student number: 571755

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	1

Assignment 2.3: Four NAND gates

Complete this table

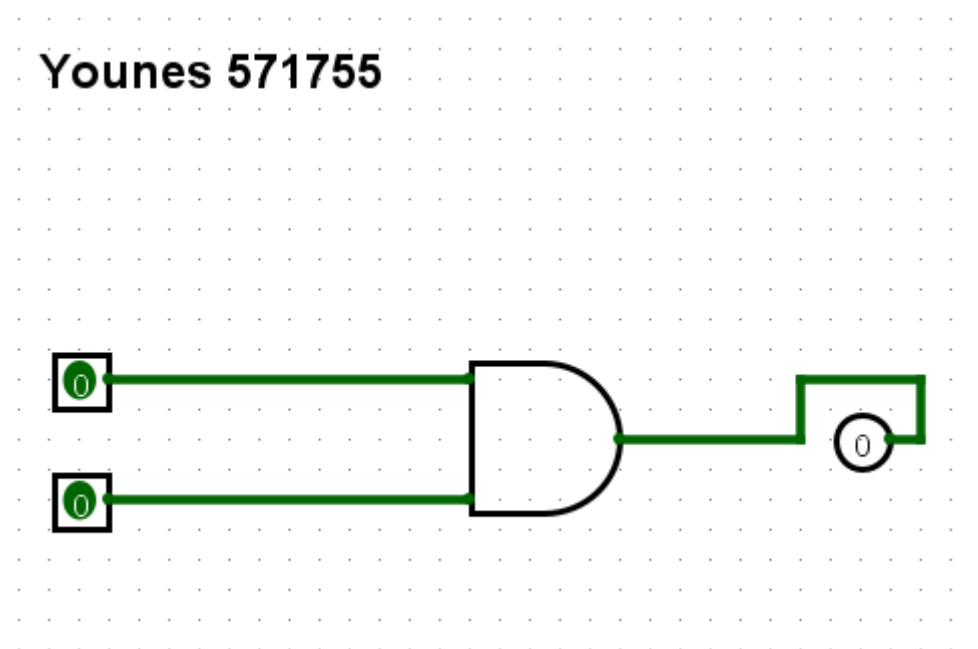
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

Using a Xor gate

Assignment 2.4: Getting to know Logisim evolution

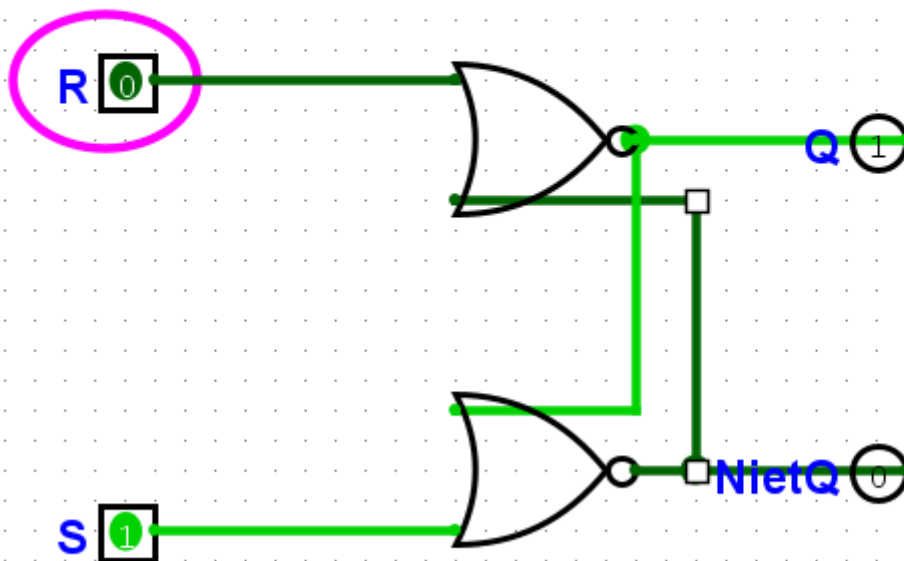
Screenshot of the design with your name and student number in it:



Assignment 2.5: SR Latch

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

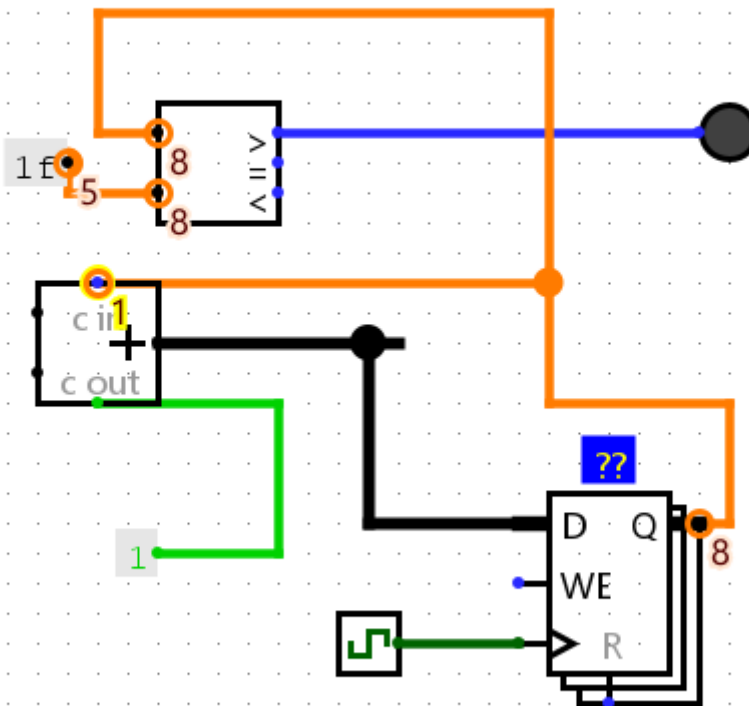
Younes 571755



Assignment 2.6: Vending Machine

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

Younes 571755



Assignment 2.7: Bitwise operators

Complete the java source code for bitwise operators. Put the source code here.

```
public class BitwiseAssignment {  
    public static void main(String[] args) {  
        int studentNumber = 571755;  
        int example = 0b1111; // as a example  
        // Bitwise AND  
        int andResult = studentNumber & example;  
        // Bitwise OR  
        int orResult = studentNumber | mask;  
        // Bitwise XOR  
        int xorResult = studentNumber ^ mask;  
        System.out.println("AND result: " + andResult);  
        System.out.println("OR result: " + orResult);  
        System.out.println("XOR result: " + xorResult);  
    }  
}
```

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.

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 scanner = new Scanner(System.in);

        System.out.println("\nMenu:");
        System.out.println("1. Is number odd?");
        System.out.println("2. Is number a power of 2?");
        System.out.println("3. Two's complement of number");
        System.out.println("4. Exit");
        System.out.print("Enter your choice: ");

        int choice = scanner.nextInt();

        if (choice == 4) {
            System.out.println("Exiting the program. Goodbye!");
            return;
        }

        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

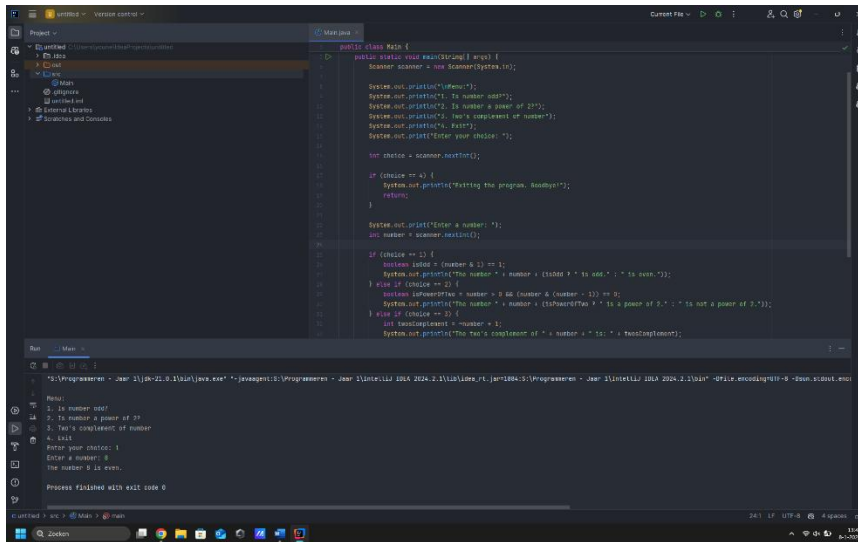
        if (choice == 1) {
            boolean isOdd = (number & 1) == 1;
            System.out.println("The number " + number + (isOdd ? " is odd." : " is even."));
        } else if (choice == 2) {
            boolean isPowerOfTwo = number > 0 && (number & (number - 1)) == 0;
            System.out.println("The number " + number + (isPowerOfTwo ? " is a power of 2." : " is not a power of 2."));
        } else if (choice == 3) {
            int twosComplement = ~number + 1;
            System.out.println("The two's complement of " + number + " is: " + twosComplement);
        } else {
            System.out.println("Invalid choice. Please try again.");
        }
    }
}
```

```

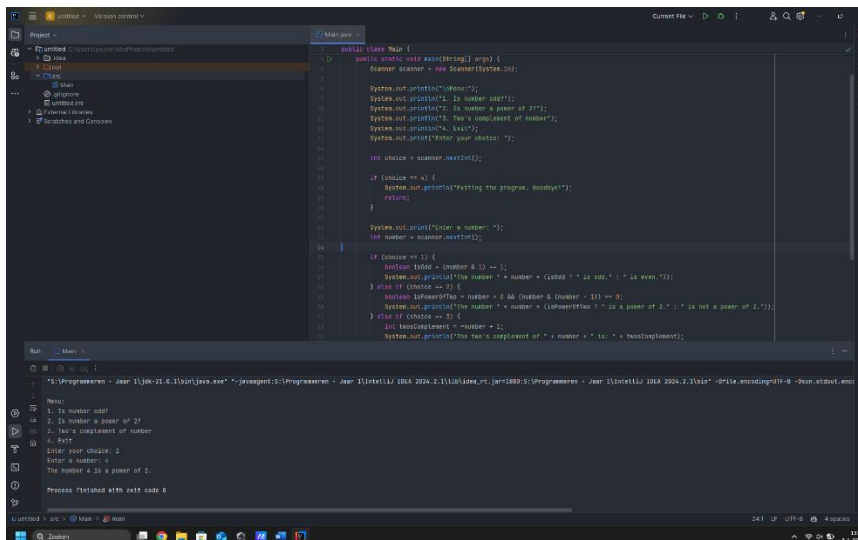
        scanner.close();
    }
}

```

SCREENSHOT (Optie 1)



SCREENSHOT (Optie 2)



SCREENSHOT (Optie 3)

The screenshot shows an IDE with a Java file named `Main.java`. The code defines a `Scanner` class with a `scan()` method that prompts the user for a number and performs several checks: if the number is odd, if it's a power of 2, and if it's a power of 3. The `main` method calls `scan()`. The output window shows the program's execution with user input 3 and the corresponding messages.

```
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        if (args.length > 0) {
            System.out.println("Exiting the program. Goodbye!");
            return;
        }

        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

        if (number % 2 == 1) {
            System.out.println("The number " + number + " is odd. It is not even.");
        } else if (number % 2 == 0) {
            System.out.println("The number " + number + " is even. It is not odd.");
        }

        if (number % 2 == 0) {
            System.out.println("The number " + number + " is a power of 2. It is not a power of 3.");
        } else if (number % 3 == 0) {
            System.out.println("The number " + number + " is a power of 3. It is not a power of 2.");
        } else {
            System.out.println("The number " + number + " is neither a power of 2 nor a power of 3.");
        }

        scanner.close();
    }
}
```

Run - Main

```
C:\Program Files\Java\jdk-11.0.10\bin\java.exe -jar C:\Users\Jens\AppData\Local\Temp\1\Main.jar
Enter a number: 3
The number's complement of 3 is: 0
Process finished with exit code 0
```

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