

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

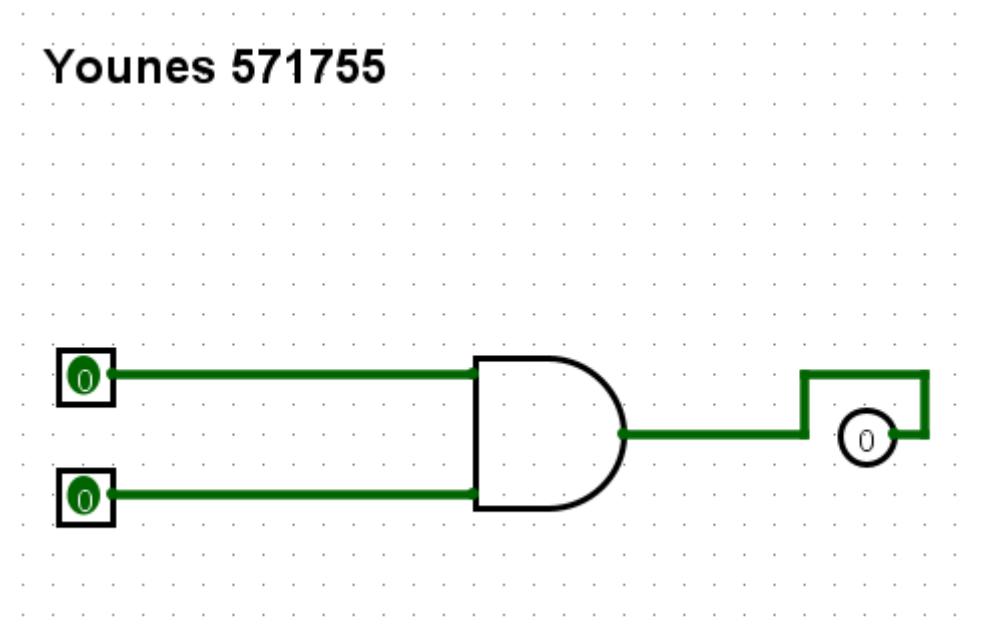
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

Using a Xor gate

Assignment 2.4: Getting to know Logisim evolution

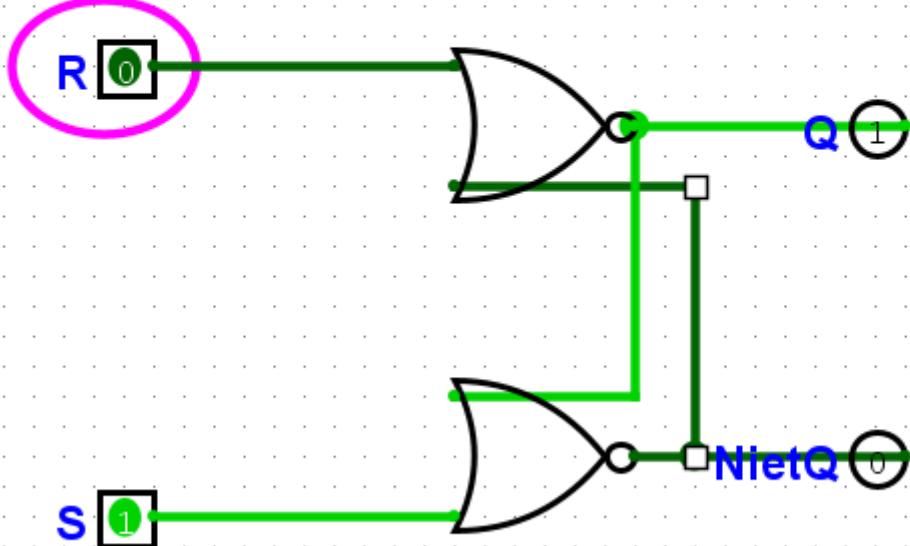
Screenshot of the design with your name and student number in it:



Assignment 2.5: SR Latch

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

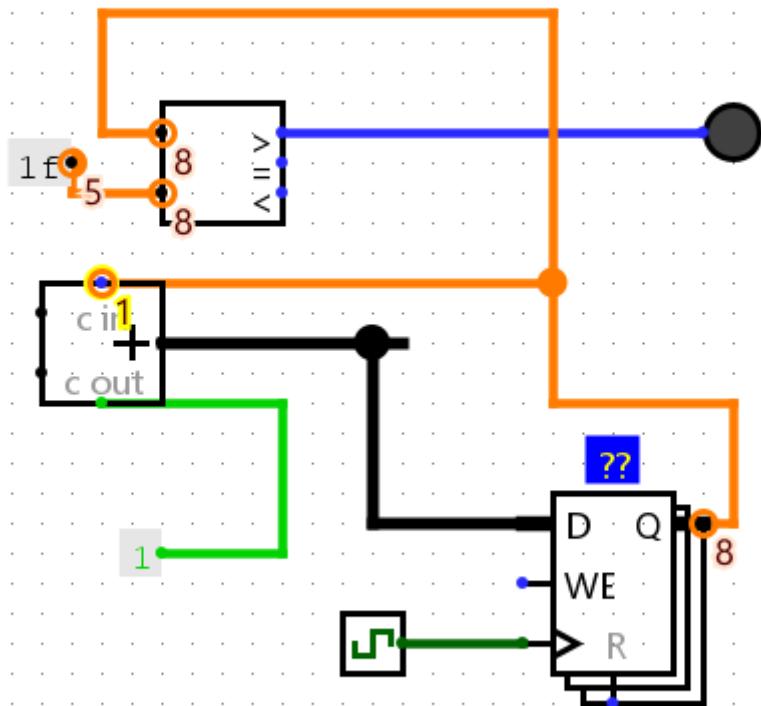
Younes 571755



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();
    }
}

```

SCREENTHOT (Optie 1)

```

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

        System.out.println("1. Is even 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");

        Enter your choice: 1
        Enter a number: 1
        The number 1 is even.

        Process finished with exit code 0
    }
}

```

SCREENTHOT (Optie 2)

```

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

        System.out.println("1. Is even 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");

        Enter your choice: 1
        Enter a number: 1
        The number 1 is even.

        Process finished with exit code 0
    }
}

```

SCREENSHOT (Optie 3)

```
public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int number;
        if (args.length == 1) {
            System.out.println("Exiting the program. Goodbye!");
            return;
        }
        System.out.print("Enter a number: ");
        number = scanner.nextInt();
        if (number >= 1) {
            int ones = number & 1;
            System.out.println("The number " + number + " is odd." : " is even.");
        } else {
            int twoPower = number < 0 && (number & -number) == 0;
            System.out.println("The number " + number + " is a power of 2." : " is not a power of 2.");
        }
        if (twoPower == 1) {
            System.out.println("The two's complement of " + number + " is: " + twoComplement);
        } else {
            System.out.println("Invalid choice. Please try again.");
        }
    }
    scanner.close();
}
```

The screenshot shows an IDE interface with a Java project named "untitled". The code in Main.java handles user input for a number and performs various checks based on the input. It prints whether the number is odd or even, checks if it's a power of 2, and calculates its two's complement if it is. The terminal window below shows the execution of the program and its output.

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