Week 2 – Logic

Student number: 581124

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

Assignment 2.3: Four NAND gates

Complete this table

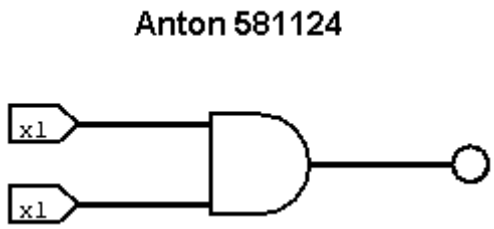
A	B	Q
0	0	0
1	0	1
0	1	1
1	1	0

How can the design be simplified?

These four NAND gates can be simplified just in one XOR gate.

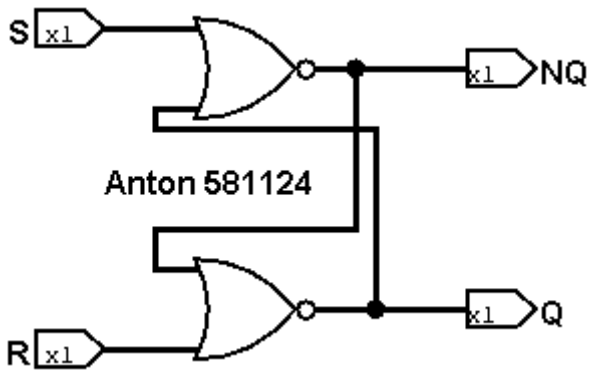
Assignment 2.4: Getting to know Logisim evolution

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



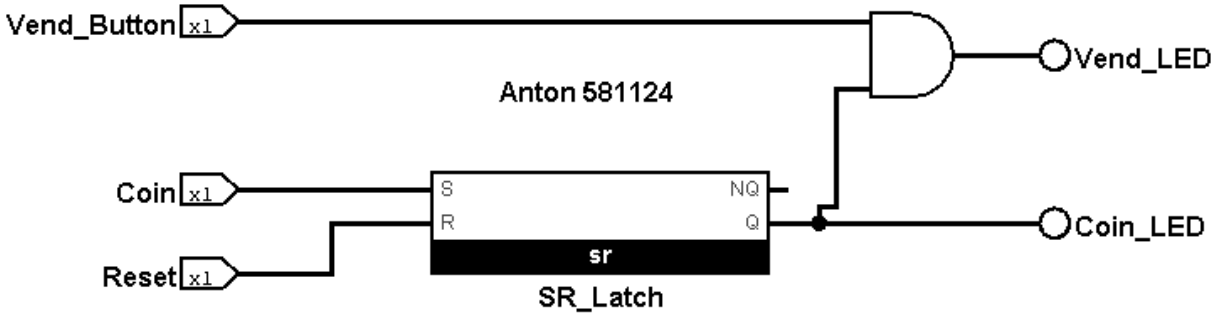
Assignment 2.5: SR Latch

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



Assignment 2.6: Vending Machine

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



Assignment 2.7: Bitwise operators

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

Task 1

```
public class Main {
	public static void main(String[] args) {
		int number = 0;

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

Task 2

```
public class Main {
	public static void main(String[] args) {
		int number = 2;
		if ( ( (number & (number - 1) ) == 0) && number > 0)
			 System.out.println("number is a power of 2");
		else
			System.out.println("number isn’t a power of 2");
 }
}
```

Task 3

Permission for the file **verse** in Octal is: **644 (RW for User, R for Group, R for Others)**

```
public class Main {
 public static void main(String[] args) {
        final int READ = 4;
        final int WRITE = 2;
        final int EXECUTE = 1;

        int userPermissions = 4;

        if((userPermissions & READ) == READ) System.out.println("User has read permissions");
        else System.out.println("User can't read. No permissions.");
 }
}
```

Task 4

```
public class Main {
        public static void main(String[] args) {
                final int READ = 4;
                final int WRITE = 2;
                final int EXECUTE = 1;

                int userPermissions = READ | EXECUTE;
                System.out.println("User permissions: " + userPermissions);
}
}
```

Task 5

```
public class Main {
        public static void main(String[] args) {
                final int READ = 4;
                final int WRITE = 2;
                final int EXECUTE = 1;
```

```
        int userPermissions = 6;
        userPermissions = userPermissions ^ WRITE;
        System.out.println("User permissions: "+userPermissions);

    }
}
```

Task 6

```
public class Main {
    public static void main(String[] args) {
        int number = 5;
        number = ~number + 1;
        System.out.println("Number: "+ number);

    }
}
```

Task 7

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

        int number = 10;
        System.out.println("Decimal integer: "+number);

        String binary = Integer.toBinaryString(number);
        String octal = Integer.toOctalString(number);
        String hexadecimal = Integer.toHexString(number);

        System.out.println("Binary representation: " + binary);
        System.out.println("Octal representation: " + octal);
        System.out.println("Hexadecimal representation: " + hexadecimal);
    }
}
```

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.

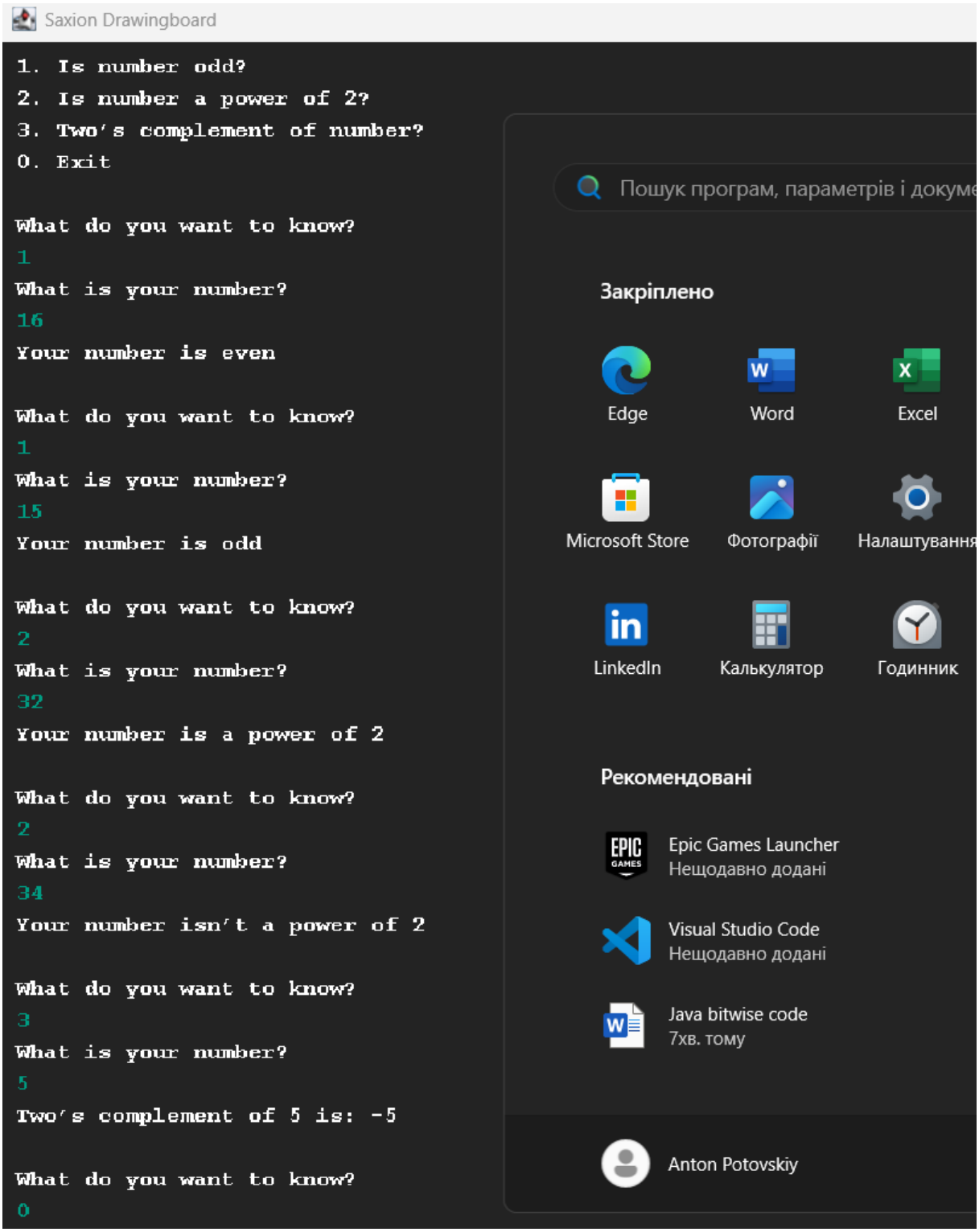
Organize your source code in a readable manner with the use of control flow and methods.

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 nl.saxion.app.SaxionApp;

import java.awt.*;

public class Application implements Runnable {

   public static void main(String[] args) {
      SaxionApp.start(new Application(), 800, 800);
   }

   public void run() {
      displayMenu();
      boolean exit = false;

      while (!exit) {
         SaxionApp.printLine();
         SaxionApp.printLine("What do you want to know?");
         int choice = SaxionApp.readInt();

         SaxionApp.printLine("What is your number?");
         int number = SaxionApp.readInt();

         switch (choice) {
            case 1:
               SaxionApp.printLine(isOdd(number));
               break;
            case 2:
               SaxionApp.printLine(isPowerOfTwo(number));
               break;
            case 3:
               SaxionApp.printLine("Two's complement of " + number + " is: " +
getComplementOfNumber(number));
               break;
```

```
            case 0:
                exit = true;
                break;
            default:
                SaxionApp.printLine("There is no such option present!", Color.RED);
                break;
        }
    }
}


public String isOdd(int number) {
    if ((number & 1) == 1)
        return "Your number is odd";
    else
        return "Your number is even";

}

public String isPowerOfTwo(int number) {
    if (((number & (number - 1)) == 0) && number > 0)
        return "Your number is a power of 2";
    else
        return "Your number isn't a power of 2";
}

public int getComplementOfNumber(int number) {
    return number = ~number + 1;
}

public void displayMenu() {
    SaxionApp.printLine("Menu");
    SaxionApp.printLine();
    SaxionApp.printLine("1. Is number odd?");
    SaxionApp.printLine("2. Is number a power of 2?");
    SaxionApp.printLine("3. Two's complement of number?");
    SaxionApp.printLine("0. Exit");
}

}
```


Saxion Drawingboard
1. Is number odd?
2. Is number a power of 2?
3. Two's complement of number?
0. Exit
What do you want to know?
1
What is your number?
16
Your number is even
What do you want to know?
1
What is your number?
15
Your number is odd
What do you want to know?
2
What is your number?
32
Your number is a power of 2
What do you want to know?
2
What is your number?
34
Your number isn't a power of 2
What do you want to know?
3
What is your number?
5
Two's complement of 5 is: -5
What do you want to know?
0
Пошук програм, параметрів і докуме
Закріплено
Edge
Word
Excel
Microsoft Store
Фотографії
Налаштування
LinkedIn
Калькулятор
Годинник
Рекомендовані
Epic Games Launcher
Нещодавно додані
Visual Studio Code
Нещодавно додані
Java bitwise code
7хв. тому
Anton Potovskiy