Template Week 2 – Logic

Student number: 562606

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?

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

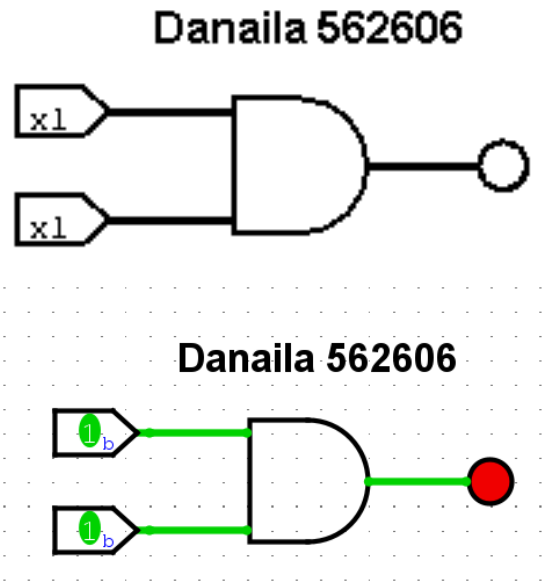
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

How can the design be simplified?

The design is done with four NAND gates but can be done with only one.

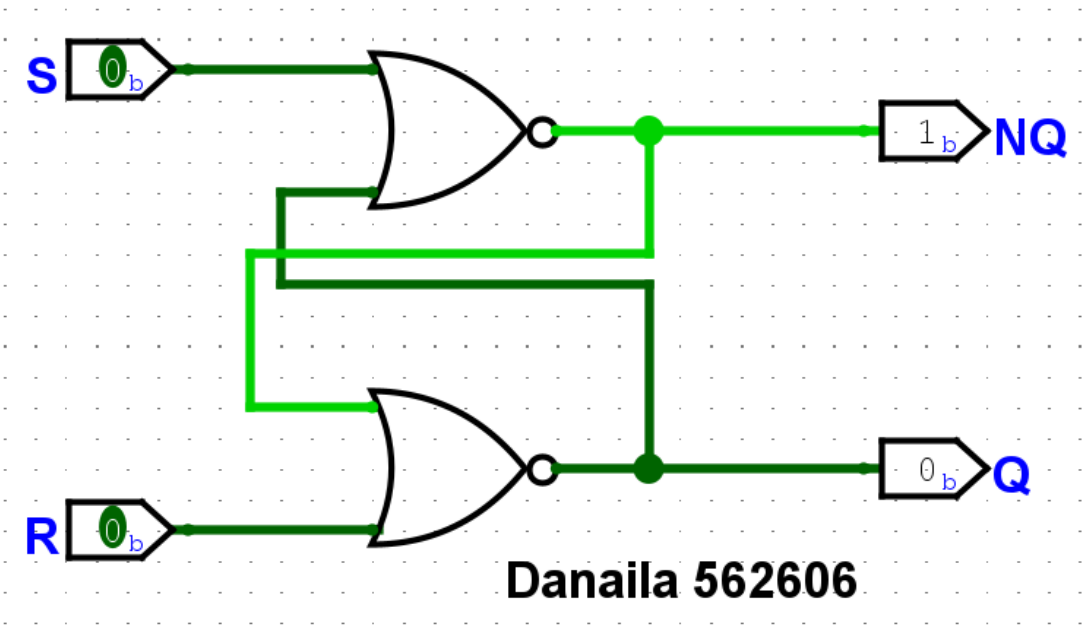
Assignment 2.4: Getting to know Logisim evolution

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



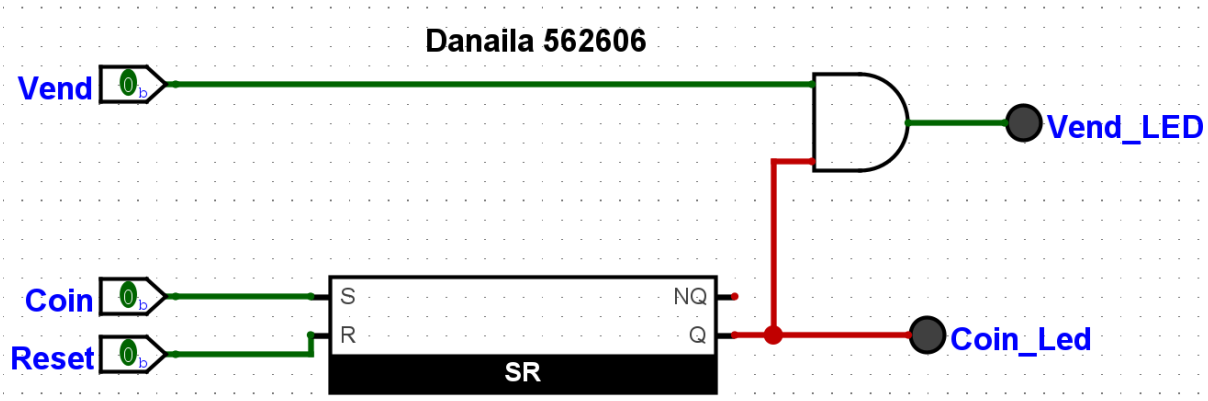
Assignment 2.5: SR Latch

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:



Bonus point assignment – week 2

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

1. Is number odd?

```
public class Main {
 public static void main(String[] args) {
int number = 6;
if((number&1) == 1) System.out.println("number is odd");
else System.out.println("number is even");
 }
}
```

```
number is even
```

2. Is number a power of 2?

```
public class Main {
 public static void main(String[] args) {
int number = 4;
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");
 }
}
```

```
number is a power of 2
```

3. Two's complement of number?

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

 }
}
```

```
Number: -5
```

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.

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

 int userPermissions = 7;

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

```
User has read permissions
```

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

 int userPermissions = 7;
 userPermissions = userPermissions | READ | EXECUTE;
 System.out.println("User permissions: "+userPermissions);

 }
}
```

```
User permissions: 7
```

```java
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);

 }
}
```

```
User permissions: 4
```

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