# Lab 1

## Task 1

My Git repository

## Task 2

### 1. Source code

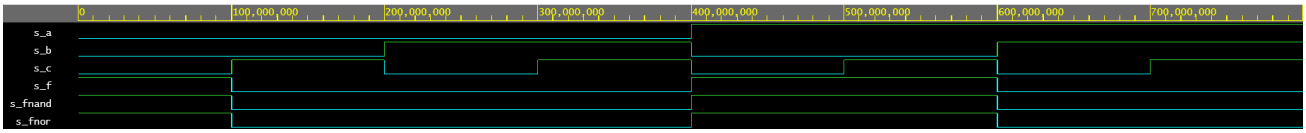
```
architecture dataflow of gates is
begin
    f_o         <=      (not b_i and a_i) or (not c_i and not b_i);
    fnand_o     <=      not(not(not b_i and a_i) and not(not c_i and not b_i));
    fnor_o      <=      not(b_i or not a_i) or not(c_i or b_i);

end architecture dataflow;
```

f = !b*a + !c*!b

NOR: !(b+!a)+!(c+b)

NAND: !(!b*a*!c*!b)

### 2. Screenshot of time course




| a | b | c | f(a,b,c) |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |

| a | b | c | f(a,b,c) |
|---|---|---|---|
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

### 3. Link

EDA Playground link

# Task 3

### 1. Source code

```
architecture dataflow of gates is
begin
        f1_o <= (x_i and y_i) or (x_i and z_i);
    f2_o <= x_i and (y_i or z_i);
    f3_o <= (x_i or y_i) and (x_i or z_i);
    f4_o <= x_i or (y_i and z_i);

end architecture dataflow;
```

x*y + x*z = x*(y+z)

(x+y) * (x+z) = x + (y*z)

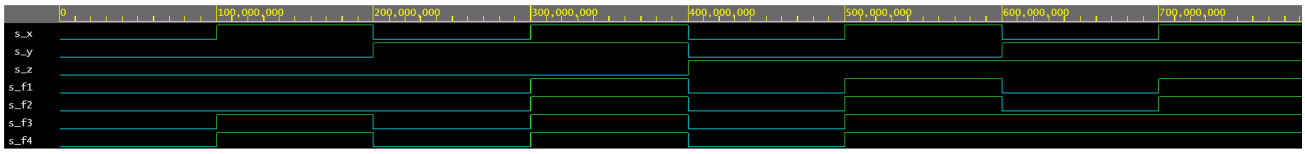
f1_o = x*y + x*z

f2_o = x*(y+z)

f3_o = (x+y) * (x+z)

f4_o = x + (y*z)

### 2. Screenshot of time course




| x | y | z | f1 | f2 | f3 | f4 |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| x | y | z | f1 | f2 | f3 | f4 |
|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 |

### 3. Link

EDA Playground link