1 Introduction

2 Teamwork planning

2.1 Interface design for scanner and GUI

Designed by the whole team, before Tuesday 23 May.

2.2 *Names* class implementation

Implementation finished by Zhengyang before Saturday 27 May.
Testing finished by Shaowu before Tuesday 30 May.

2.3 *Scanner* class implementation

Implementation finished by Shaowu before Saturday 27 May.
Testing finished by Zhiwei before Tuesday 30 May.

2.4 *Parser* class implementation

Implementation finished by Zhiwei and Zhengyang before Saturday 27 May.
Testing finished by Shaowu before Tuesday 30 May.

2.5 *GUI* class implementation

Implementation finished by Zhiwei and Shaowu before Saturday 27 May.
Testing finished by Zhengyang before Tuesday 30 May.

2.6 System integration

Integration and testing by the whole team, before the deadline of the second interim report (Friday 2 June).

2.7 System maintenance

Modification and testing by the whole team, before the deadline of the final report (Thursday 8 June).

3 Syntax in EBNF language

```
file = 'DEVICES', {DEV, ','}, DEV, ';', 'CONNECT', {CON, ','}, CON, ';',
       'MONITOR', {MON, ','}, MON, ';';
DEV  = 'CLOCK', DEV_NAME, digit, {digit}                          |
       'SWITCH', DEV_NAME, ( 1 | 0 )                              |
       'AND' | 'NAND' | 'OR' | 'NOR', DEV_NAME, [1], digit        |
       'D_TYPE', DEV_NAME                                         |
```

```
        'XOR', DEV_NAME;
DEV_NAME* =     digit | letter, {digit | letter | '_'};
CON       =     O_PIN, '=>', I_PIN;
O_PIN     =     DEV_NAME                          |
                DEV_NAME, '.', 'Q' | 'QBAR';
I_PIN     =     DEV_NAME, '.', 'I', [1], digit    |
                DEV_NAME, '.', 'DATA'|'CLK'|'SET'|'CLEAR';
MON       =     O_PIN | I_PIN;
```

*DEV_NAME = [0-9a-zA-Z_]+, DEV_NAME can be any combination of letter and number and '_', other than "DEVICES", "CONNECT", "MONITOR", "CLOCK", "SWITCH", "AND", "NAND', "OR", "NOR", "D_TYPE", "XOR"

4 Syntax error identification and handling

5 Semantics error identification and handling

6 Example definition files

Circuit 1 definition file.

```
// This is a single line comment.
DEVICES AND A 1, // an AND gate called 'A' with one input is declared.
        OR  B 1,
        XOR C,
        NAND D 3,
        SWITCH S1 1, // a switch S1 is declared and initialised to 1.
        SWITCH S2 1,
        SWITCH S3 1,
        SWITCH S4 1;
CONNECT S1 => A.I1, // switch S1 is connected to the first input of A.
        S2 => B.I1,
        S3 => C.I1,
        S4 => C.I2,
        A  => D.I1,
        B  => D.I2,
        C  => D.I3;
MONITOR D;
```

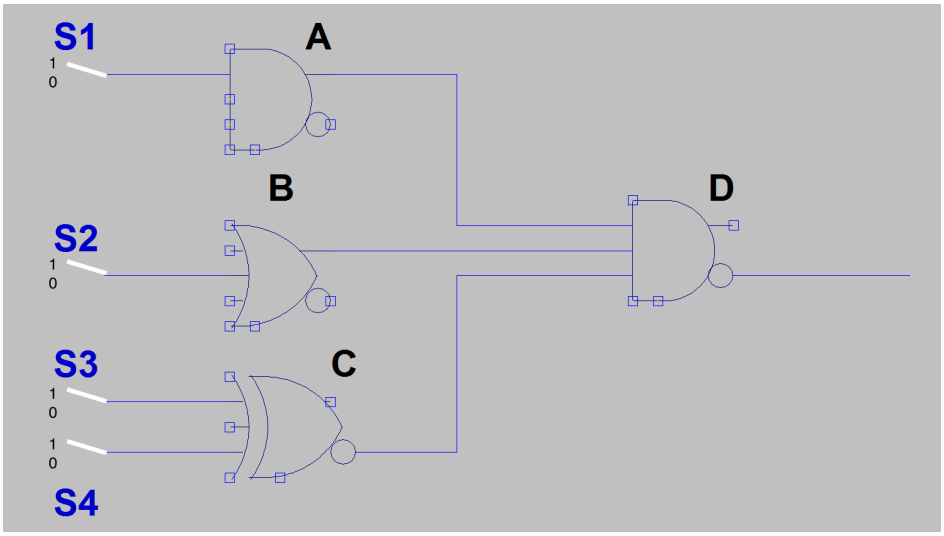

Figure 1: Circuit1

Circuit 2 definition file.

```
DEVICES CLOCK L 100, // clock output changes every 100 simulation cycles.
        SWITCH S1 1,
        SWITCH S2 0,
        SWITCH S3 0,
        DTYPE M,
        NOR A 2;
CONNECT S1 => M.SET,
        S2 => M.DATA,
        S3 => M.CLEAR,
        L  => M.CLK,
        M.Q => A.I1,
        M.QBAR => A.I2;
MONITOR A,
        QBAR;
/* A and QBAR are being monitored,
this is a multiline comment.*/
```

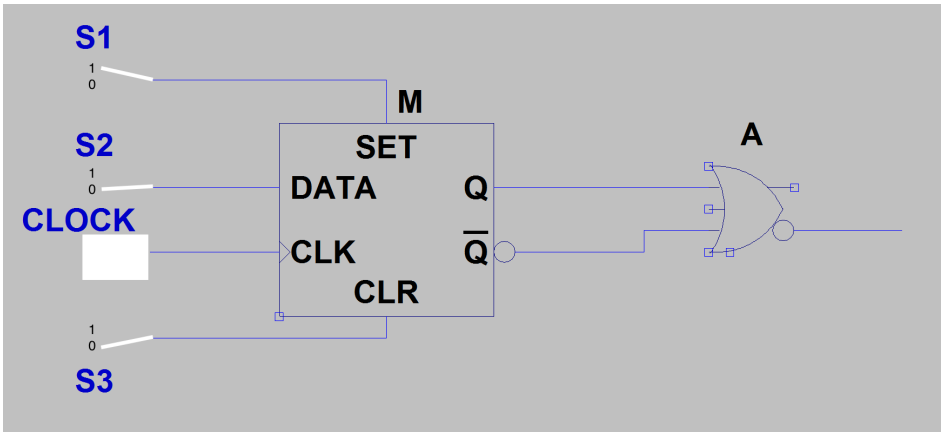

Figure 2: Circuit1