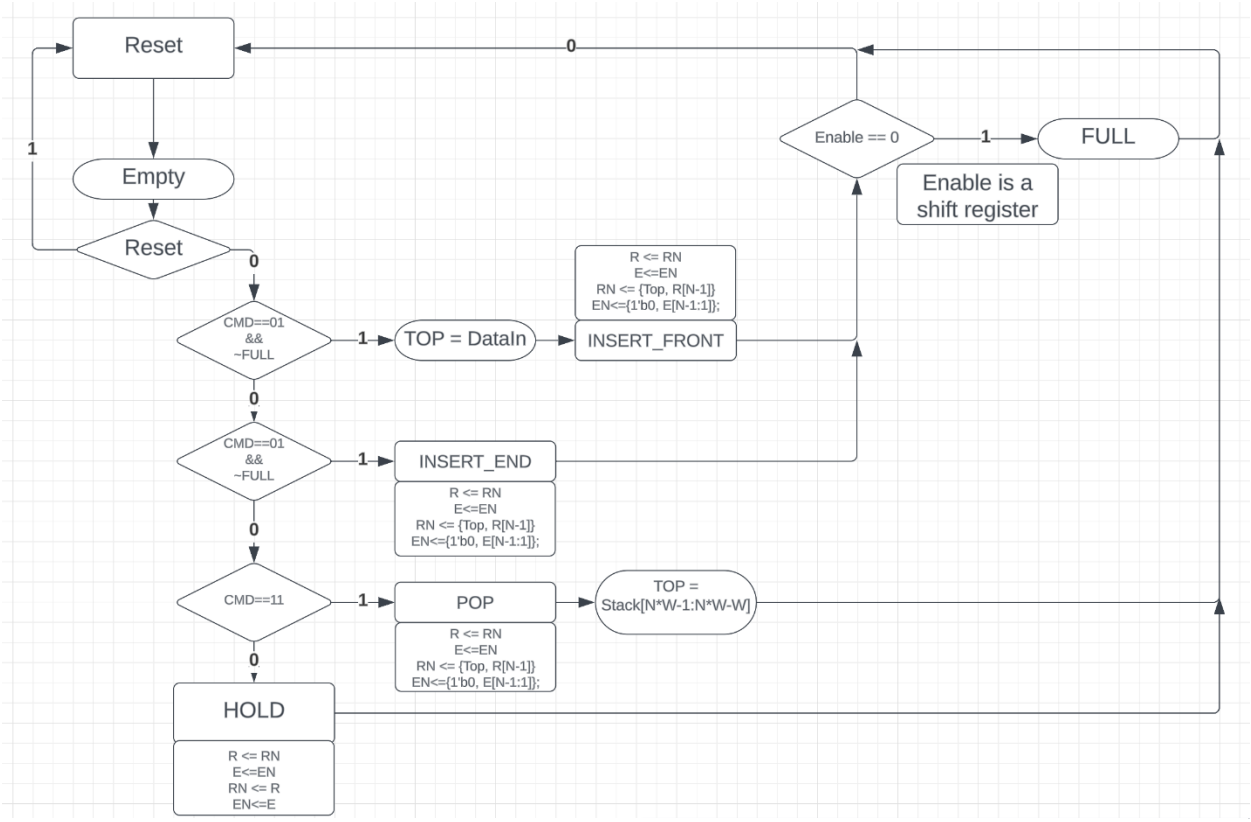
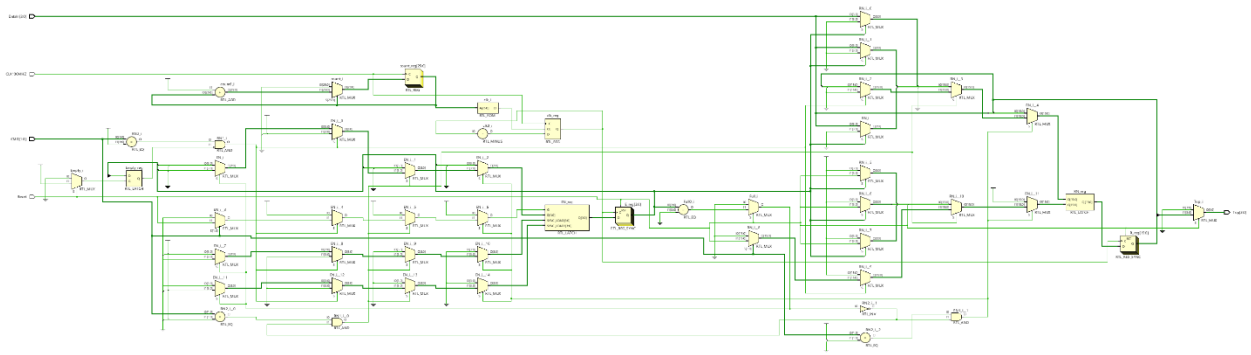
Task 1:


Reset
0
1
Empty
Reset
0
CMD==01
&&
~FULL
1
TOP = DataIn
R <= RN
E<=EN
RN <= {Top, R[N-1]}
EN<={1'b0, E[N-1:1]};
INSERT_FRONT
0
CMD==01
&&
~FULL
1
INSERT_END
R <= RN
E<=EN
RN <= {Top, R[N-1]}
EN<={1'b0, E[N-1:1]};
0
CMD==11
1
POP
R <= RN
E<=EN
RN <= {Top, R[N-1]}
EN<={1'b0, E[N-1:1]};
TOP =
Stack[N*W-1:N*W-W]
0
HOLD
R <= RN
E<=EN
RN <= R
EN<=E
Enable == 0
1
FULL
Enable is a
shift register

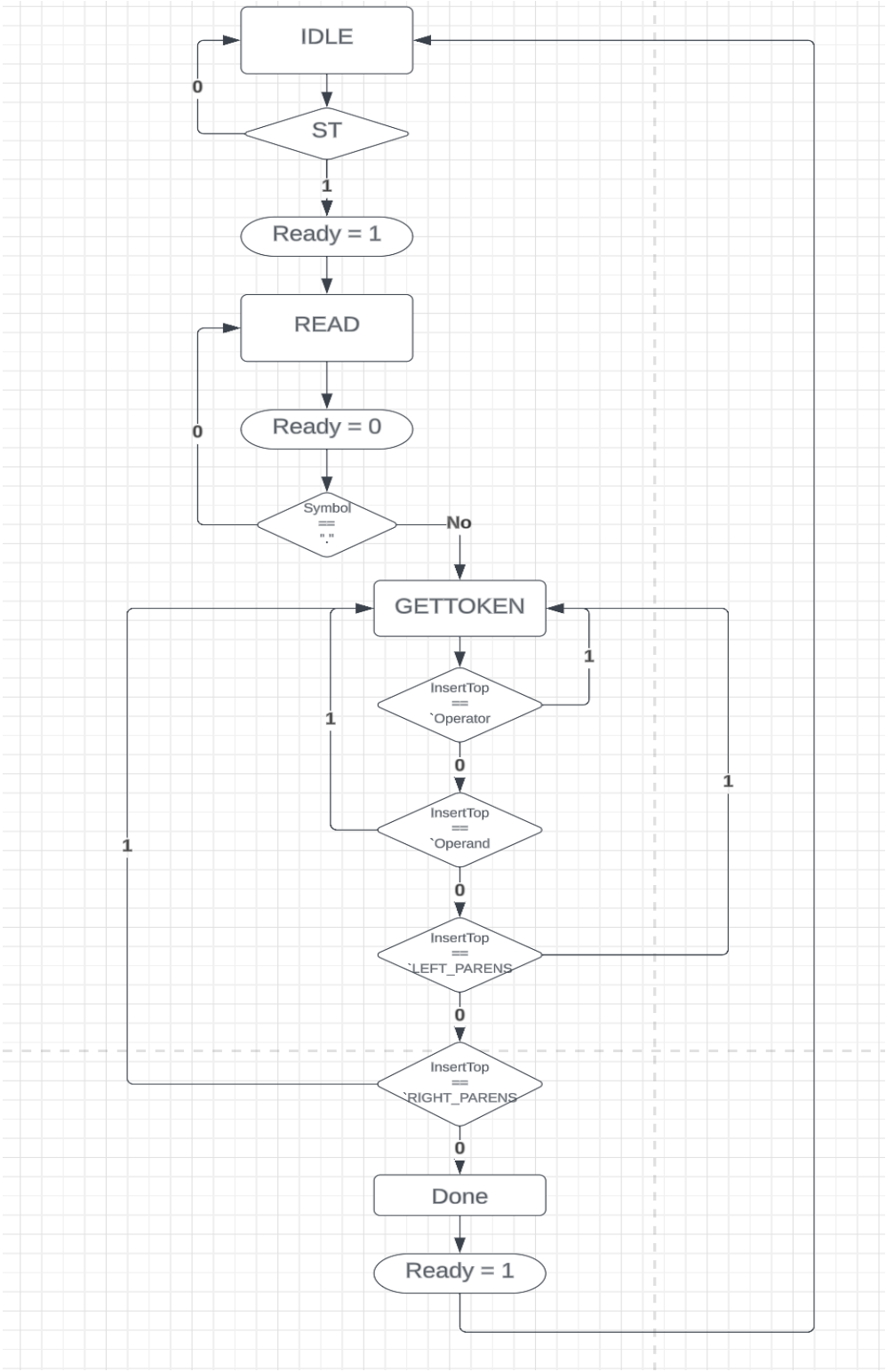


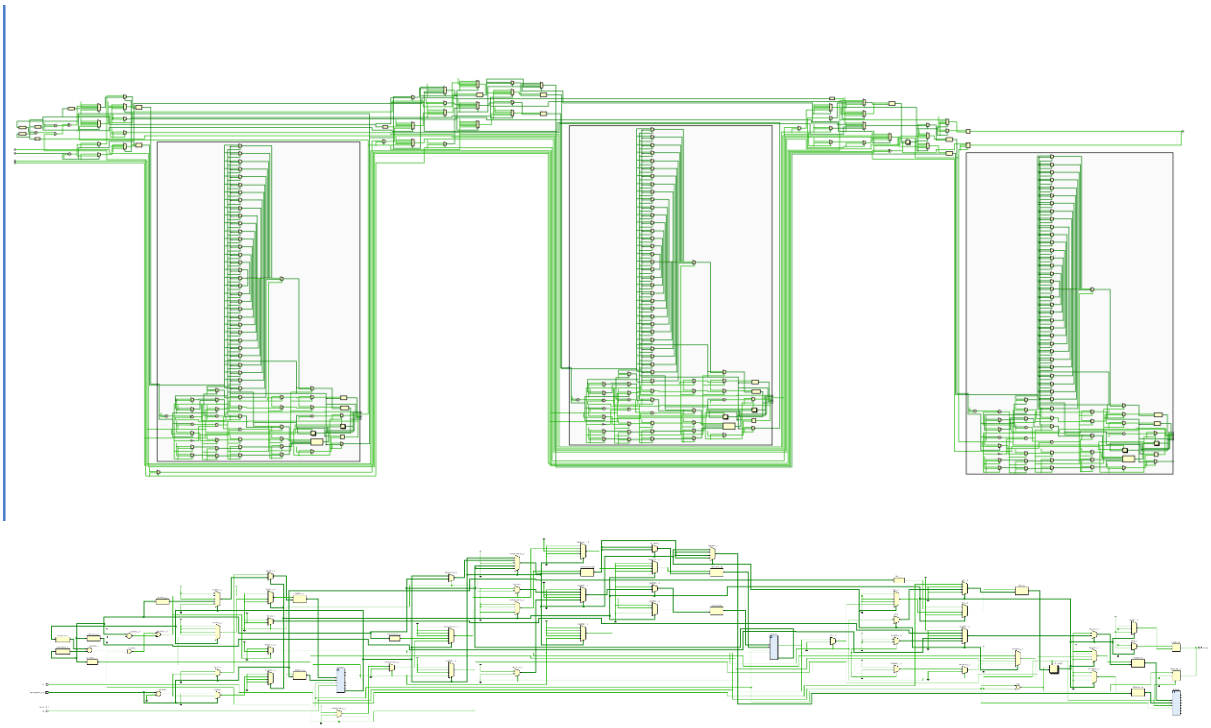
```
VCD info: dumpfile Stack.vcd opened for output.
$time =                    0 CMD = xx DataIn = xxxxxxxx, Full = x, Empty = x, Top = xxxxxxxx
$time =                   20 CMD = xx DataIn = xxxxxxxx, Full = 0, Empty = x, Top = 00000000
$time =                   40 CMD = xx DataIn = xxxxxxxx, Full = 1, Empty = 0, Top = 00000000
$time =                   60 CMD = xx DataIn = xxxxxxxx, Full = 0, Empty = 1, Top = 00000000
$time =                   63 CMD = 10 DataIn = 00000001, Full = 0, Empty = 1, Top = 00000000
$time =                   80 CMD = 10 DataIn = 00000001, Full = 0, Empty = 0, Top = 00000001
$time =                   83 CMD = 10 DataIn = 00000010, Full = 0, Empty = 0, Top = 00000001
$time =                  100 CMD = 10 DataIn = 00000010, Full = 0, Empty = 0, Top = 00000010
$time =                  103 CMD = 01 DataIn = 00000011, Full = 0, Empty = 0, Top = 00000010
$time =                  123 CMD = 01 DataIn = 00000100, Full = 0, Empty = 0, Top = 00000010
$time =                  343 CMD = 00 DataIn = 00000100, Full = 0, Empty = 0, Top = 00000010
$time =                  363 CMD = 10 DataIn = 01100111, Full = 0, Empty = 0, Top = 00000010
$time =                  380 CMD = 10 DataIn = 01100111, Full = 0, Empty = 0, Top = 01100111
$time =                  583 CMD = 11 DataIn = 01100111, Full = 0, Empty = 0, Top = 01100111
$time =                  603 CMD = 10 DataIn = 01100111, Full = 0, Empty = 0, Top = 01100111
$time =                  760 CMD = 10 DataIn = 01100111, Full = 1, Empty = 0, Top = 01100111
$time =                  823 CMD = 00 DataIn = 01100111, Full = 1, Empty = 0, Top = 01100111
$time =                  843 CMD = 10 DataIn = 11111111, Full = 1, Empty = 0, Top = 01100111
$time =                  863 CMD = 11 DataIn = 11111111, Full = 1, Empty = 0, Top = 01100111
$time =                  880 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 01100111
$time =                 1240 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000010
$time =                 1260 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000001
$time =                 1280 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000011
$time =                 1300 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000100
$time =                 1500 CMD = 11 DataIn = 11111111, Full = 0, Empty = 1, Top = 00000000
$time =                 1520 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000000
$time =                 1540 CMD = 11 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000000
$time =                 1883 CMD = 00 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000000
$time =                 1903 CMD = 10 DataIn = 11111111, Full = 0, Empty = 0, Top = 00000000
$time =                 1920 CMD = 10 DataIn = 11111111, Full = 0, Empty = 0, Top = 11111111
$time =                 1923 CMD = 00 DataIn = 11111111, Full = 0, Empty = 0, Top = 11111111
FlexibleInsertStack.v:225: $finish called at 2423 (1s)
[Done] exit with code=0 in 0.24 seconds
```

Task 2:

The farthest left two switches are CMD[1:0]. The switches farthest to the right are DataIn[3:0]. The corresponding lights above those switches are the Top[3:0] bits. The center button is the Reset bit. The middle LED is the Empty signal and the Full signal is to the left of it.

Task 3:


IDLE
0
ST
1
Ready = 1
READ
Ready = 0
0
Symbol
==
"."
No
GETTOKEN
1
InsertTop
==
`Operator
1
0
1
InsertTop
==
`Operand
1
0
InsertTop
==
`LEFT_PARENS
0
InsertTop
==
`RIGHT_PARENS
0
Done
Ready = 1



```
[Running] Infix2Postfix.v
VCD info: dumpfile IntoPost.vcd opened for output.
Infix2Postfix.v:261: $finish called at 136 (1s)
Infix Expression = 9+8*(7-2*(6+5*4*(3+2*9)/8)).
Postfix Expression = 9872654*329*+*8/+*-*+
[Done] exit with code=0 in 0.133 seconds
```