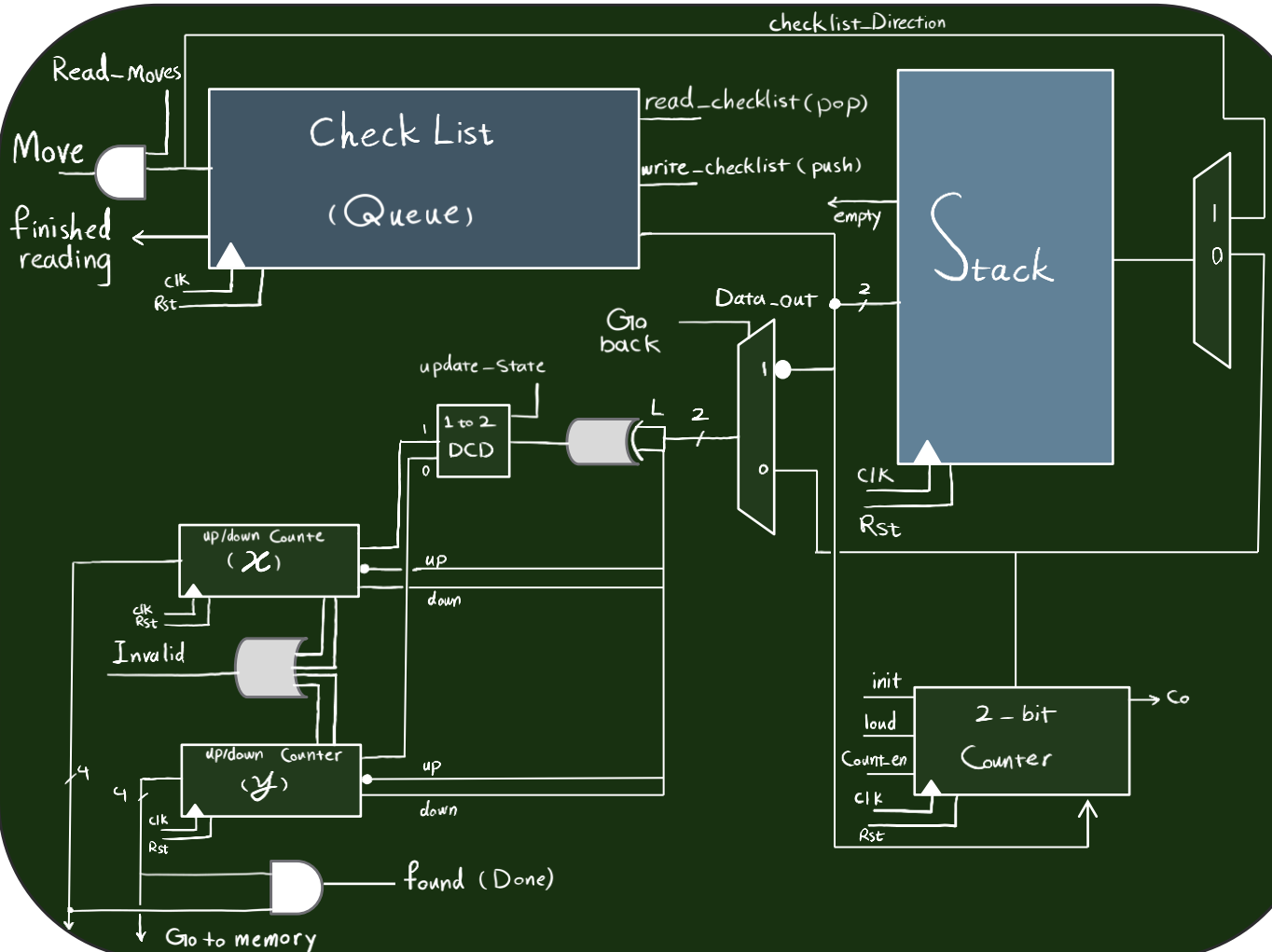# Maze Project

Computer Architecture

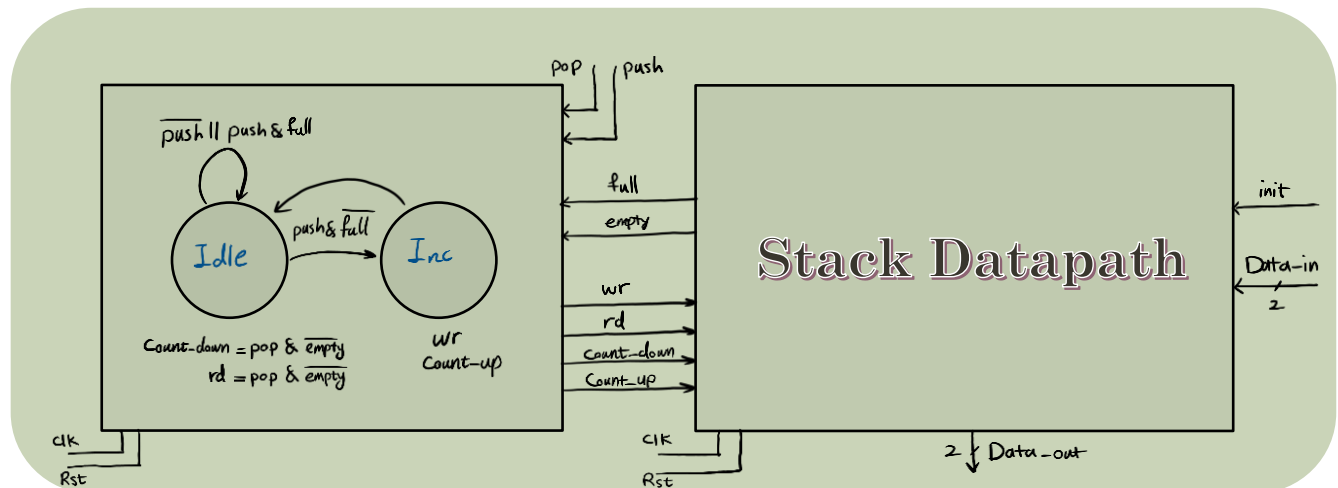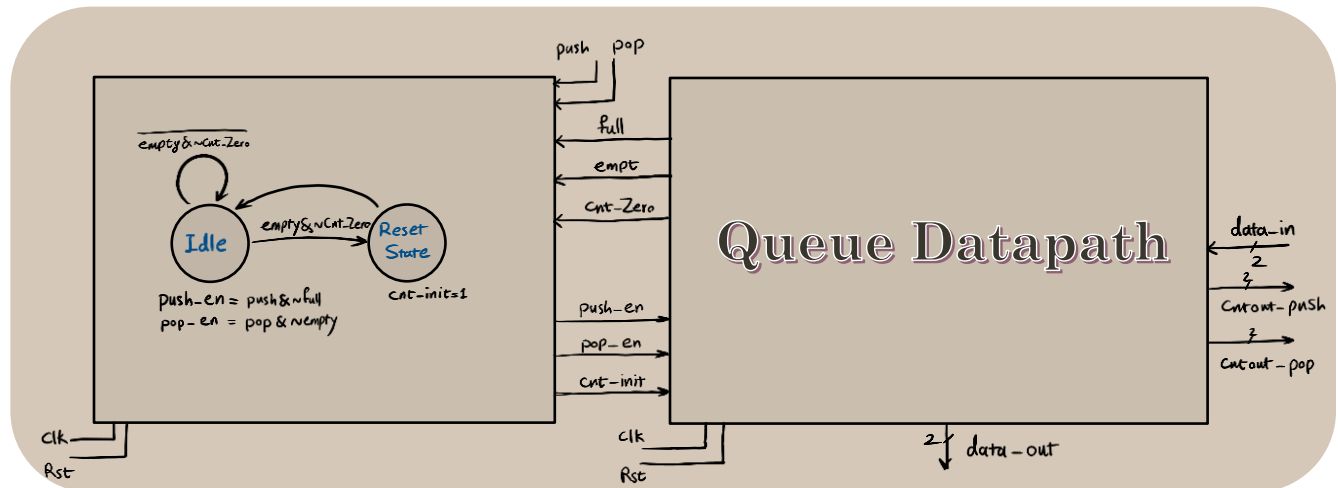Milad Mazaheri: 810102585
Parsa Bukani: 810102501

# Maze Solver Controller



Read-Moves
Move
finished reading

Check List (Queue)

read_checklist (pop)
write_checklist (push)
empty

clk
Rst

checklist_Direction

Stack

1
0

clk
Rst

update_state
1 to 2 DCD
1
0

Go back

Data_out
2

L
2

1
0

up/down Counte (x)
up
down

clk
Rst

Invalid

up/down Counter (y)
up
down

clk
Rst

4
4

found (Done)

Go to memory

init
loud
Count_en
clk
Rst

2 - bit Counter

Co
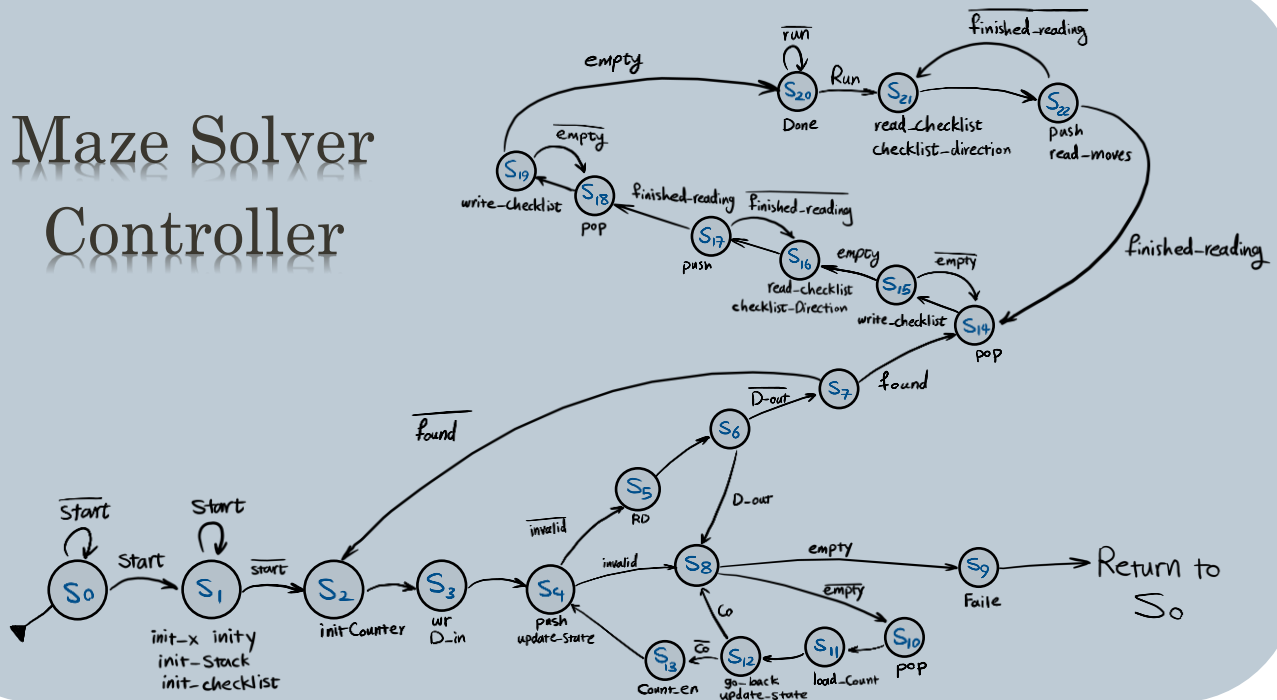
# Overview on Stack and Queue

# Result And Simulation

_ solvable Map

```
# Maze solved successfully.
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 01
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 00
# Move: 01
# Move: 01
# Move: 01
# Move: 00
# Move: 00
# Move: 01
# Move: 01
# Move: 01
# Move: 01
# Move: 01
# Move: 01
# Move: 01
# Move: 01
# Move: 11
# Move: 11
# Move: 01
# Move: 01
# Move: 01
# Move: 00
# Move: 00
# Move: xx
# Move: xx
+ Move: xx
```

```
0000000011000111
0110111011011111
0110111000011100
0111111111111101
0000000111111101
1011010100000000
1011000101111101
1011111101111101
1011110001110001
1000011101000111
1011011101110111
0011000001111111
1011111101110111
1000001100110000
1011011111110110
1011000000000110
```
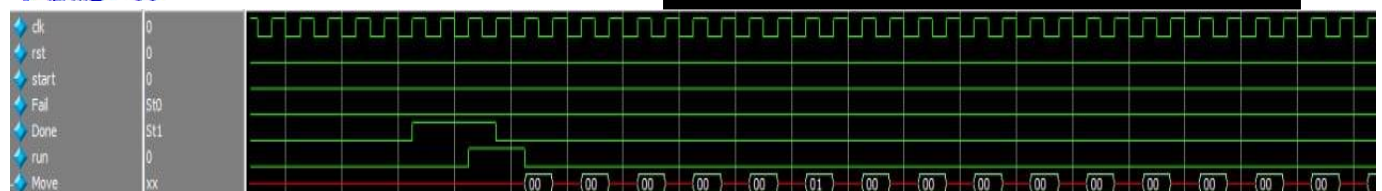
## _ unsolvable Map
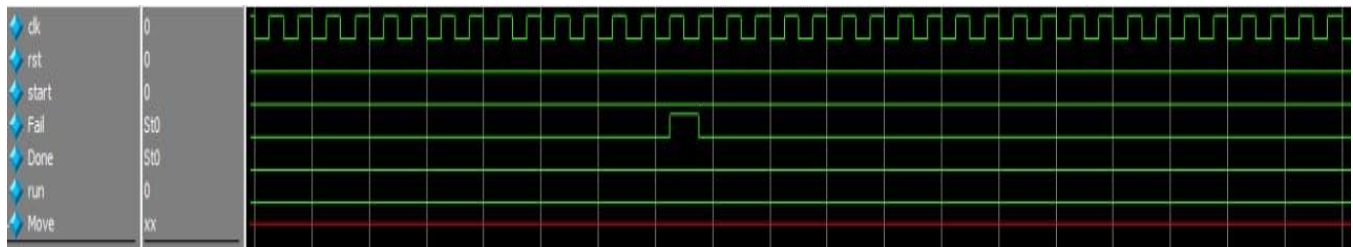


```
# No solution found.
# ** Note: $stop    : C:/Users/parsa/OneDrive/Desktop/Programming/python/Semester 4/CA/Computer-Architecture-Spring-2025/CA1/test_bench.v(46)
#    Time: 13905 ns  Iteration: 0  Instance: /system_tb
# Break in Module system_tb at C:/Users/parsa/OneDrive/Desktop/Programming/python/Semester 4/CA/Computer-Architecture-Spring-2025/CA1/test_bench.v line 46
```

```
1    0000000011000111
2    0110111011011111
3    0110111000011100
4    0111111110011101
5    0000000111111101
6    1011010100010000
7    1011000101101101
8    1011111101101101
9    1111110001111001
10   1000011101000111
11   1011011101110111
12   0011000001111111
13   1011111101110111
14   1000001100110000
15   1011011100110110
16   1011000000000110
```