

HW3-2-report

➤ System configuration

Scalar Product of Boolean vector (A , B) = $\sum(A_i \cdot B_i)$

input.alice = A[i] and input.bob = B[i]

For sum we use XOR and for multiplication we use AND

ARR[i] = (A[i] AND B[i]) //store the result of AND in array

Scalar Product = XOR(ARR[i] , ARR[i+1])

For XOR following configuration was used:

$$\sum [(ARR[i] \text{ AND } (\text{NOT}(ARR[i+1]))) \text{ OR } ((\text{NOT}(ARR[i]) \text{ AND } ARR[i+1]))]$$

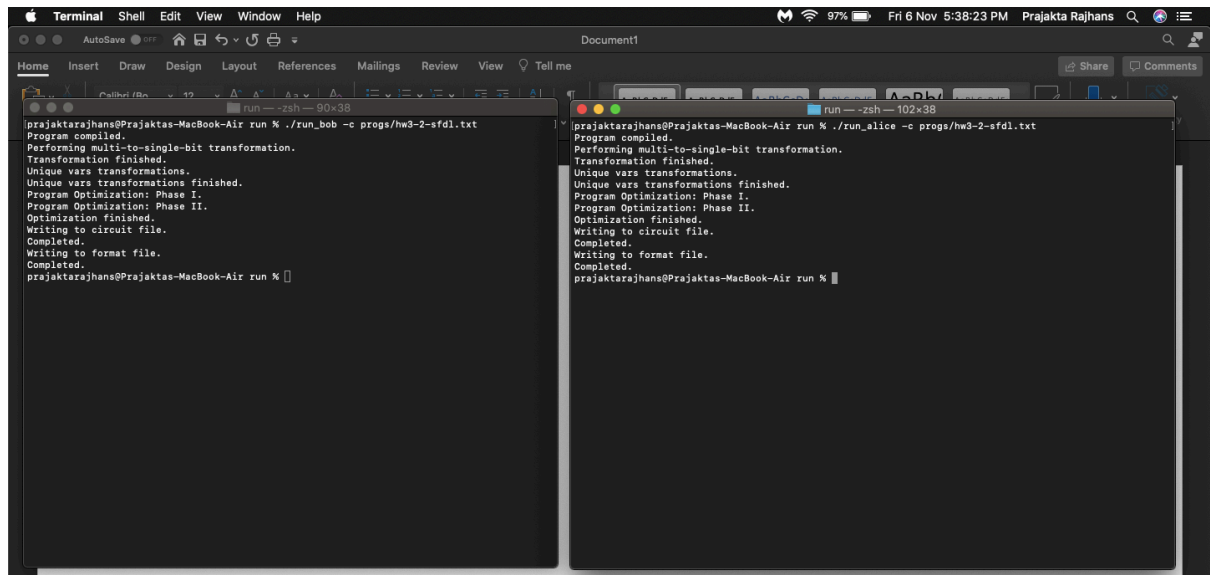
where i= 0 to 9

➤ Input vector

Alice = {1,1,0,0,1,1,0,1,1,0}

Bob = {1,0,0,0,1,1,1,0,0,1}

➤ Compiling the program

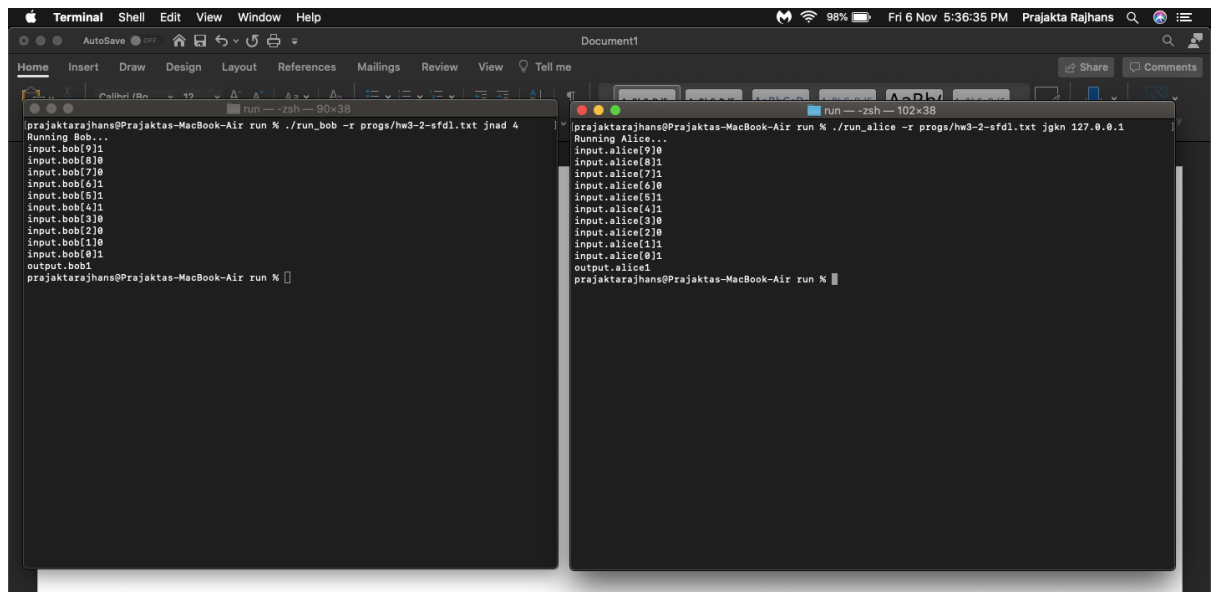


The image shows two terminal windows side-by-side on a macOS system. The left window is titled 'run -- zsh -- 90x38' and the right window is titled 'run -- zsh -- 102x38'. Both windows show the output of a program compilation process. The output for both is identical and includes the following steps: 'Program compiled.', 'Performing multi-to-single-bit transformation.', 'Transformation finished.', 'Unique vars transformations.', 'Unique vars transformations finished.', 'Program Optimization: Phase I.', 'Program Optimization: Phase II.', 'Optimization finished.', 'Writing to circuit file.', 'Completed.', 'Writing to format file.', and 'Completed.'. The terminal windows are part of a larger application window titled 'Document1' with a menu bar at the top showing 'Terminal', 'Shell', 'Edit', 'View', 'Window', and 'Help'.

```
prajaktarajhans@Prajaktas-MacBook-Air run % ./run_bob -c progs/hw3-2-sfd1.txt
Program compiled.
Performing multi-to-single-bit transformation.
Transformation finished.
Unique vars transformations.
Unique vars transformations finished.
Program Optimization: Phase I.
Program Optimization: Phase II.
Optimization finished.
Writing to circuit file.
Completed.
Writing to format file.
Completed.
prajaktarajhans@Prajaktas-MacBook-Air run %
```

```
prajaktarajhans@Prajaktas-MacBook-Air run % ./run_alice -c progs/hw3-2-sfd1.txt
Program compiled.
Performing multi-to-single-bit transformation.
Transformation finished.
Unique vars transformations.
Unique vars transformations finished.
Program Optimization: Phase I.
Program Optimization: Phase II.
Optimization finished.
Writing to circuit file.
Completed.
Writing to format file.
Completed.
prajaktarajhans@Prajaktas-MacBook-Air run %
```

➤ Running the program:



```
prajaktarajhans@Prajaktas-MacBook-Air run % ./run_bob -r progs/hw3-2-sfd1.txt jnad 4
Running Bob...
input.bob[9]1
input.bob[8]0
input.bob[7]0
input.bob[6]1
input.bob[5]1
input.bob[4]1
input.bob[3]0
input.bob[2]0
input.bob[1]0
input.bob[0]1
output.bob1
prajaktarajhans@Prajaktas-MacBook-Air run %

prajaktarajhans@Prajaktas-MacBook-Air run % ./run_alice -r progs/hw3-2-sfd1.txt jgkn 127.0.0.1
Running Alice...
input.alice[8]1
input.alice[9]0
input.alice[7]1
input.alice[6]0
input.alice[5]1
input.alice[4]1
input.alice[3]0
input.alice[2]0
input.alice[1]1
input.alice[0]1
output.alice1
prajaktarajhans@Prajaktas-MacBook-Air run %
```

➤ Output
output.alice=1
output.bob=1