**INTRODUCTION**

* Barrel shifter is a combinational logic circuit.
* It has M inputs and N outputs where M>N.
* It Shifts the set of bits from input sequence to produce outputs.
* The number of shifts is decided by the control\selection signal.
* Barrel shifter can perform N bit shift in single combinational function and rotate right operation.

**4-BIT BARREL SHIFTER USING 2X1 MUX**

**CIRCUIT DIAGRAM**A diagram of a barrel shift

Description automatically generated

**DESIGN TABLE**

A close-up of a white sheet

Description automatically generated

* This design table is done according to the number of shifts it’s going to do.
* In my case, I have 2 selection or control lines s1 and s0 where these two decide the number of right shifts it’s going to make.
* Here the s1 will have 2 bits shifted to right.
* Whereas the s0 output will have 1 bit shifted to right
* Here by making the design of circuit diagram using this design table.

**OUTPUTS**

**A computer screen shot of a black screen

Description automatically generated**

* Here the input given was 0001 where the control signal becomes 1 this will perform 1bit right shift.
* When on second control signal it will be having 2-bit shift from the given input. Similarly for each selection line the bits are shifted right.

**CONCLUSION**

A barrel shifter is a digital circuit that efficiently shifts binary numbers left or right based on a shift amount. Unlike conventional shifters, which shift by one position at a time, a barrel shifter can perform multiple shifts. It utilizes combinational logic to decode the shift amount and generate the shifted output in a single clock cycle, making it ideal for high-speed and complex arithmetic operations in digital systems such as processors and DSPs.