

## \_\_DESCRIBING OUR CIRCUIT\_\_

### PSEUDO SEQUENCE CODE GENERATOR

WE HAVE A TASK TO GENERATE RANDOM SEQUENCE CODE GENERATORS OF MAXIMUM 9 BIT NUMBER.I HAVE DESIGNED MY CIRCUIT USING LFSR(LINEAR FEEDBACK SHIFT REGISTER).FIRST LET US TRY TO UNDERSTAND OUR CIRCUIT.

-->LFSR

1)LFSR1-LFSR ARE BUILD USING SHIFT REGISTERS. IN MY CIRCUIT I HAVE USED LFSR OF 9 BIT .GENERALLY EACH LFSR WILL HAVE A SPECIFIC EQUATION DEPENDING ON CIRCUIT CONNECTION.IN OUR CIRCUIT,IN FIRST LFSR ,THE SEED WILL BE LOADED INTO REGISTERS AND THEN ON THE XOR OPERATION OF LAST TWO LSB BITS WILL BE LOADED INTO MSB WITH RIGHT SHIFT OF OTHER BITS ,SO THE OUTPUT SEQUENCE GENERATED WILL BE RANDOM.

2)LFSR2 -IT IS ALSO OF SAME AS LFSR 1.BUT SEED IS PERMUTED .PERMUTED MEANS WE HAVE GENERATED OTHER SEED USING THE ROOT SEED AND LOADED IT INTO OUR LFSR.FROM THEN ON THE LFSR IS LOADED WITH THE XOR OPERATION OF LAST 3RD AND 4TH LSB INTO OUR MSB BY RIGHT SHIFTING OTHER BITS.EVEN THIS SEQUENCE GENERATED BY OUR CIRCUIT IS RANDOM AS NUMBERS GENERATED WILL BE HAVING A LOT OF DIFFERENCE.

-->NEXT

WHEN THIS TWO LFSR ARE GENERATED THEY WILL BE GENERATING RANDOM SEQUENCES ,SO EVEN ADDING THEM GENERATES RANDOM SEQUENCES SO I HAVE ADDED BOTH LFSR OUTPUTS.I HAVE USED THREE 4 BIT ADDERS TO ADD THESE SEQUENCES .OUT OF THE TOTAL BITS THAT IS BEING GENERATED AS OUTPUT I HAVE USED 9 BITS.

-->SEQUENCE THAT IS BEING GENERATED IF IT HAS INFORMATION REGARDING THE SEQUENCE WIDTH THE LOSS OF DATA IS LESS ,SO I HAVE EVEN ADDED BINARY

VALUE OF SEQUENCE WIDTH TO MY LAST SEQUENCE GENERATED.I HAVE USED SAME THREE 4 BIT ADDERS AND THEN ADDED MY SEQUENCE WIDTH.

-->OUT OF THE NINE BIT SEQUENCE THAT IS BEING GENERATED,I HAVE MADE A CIRCUIT THAT COULD GENERATE ONLY NUMBER OF BITS SPECIFIED IN SEQUENCE WIDTH. SO OUT OF THE NINE BITS GFENERATED ONLY BITS THAT ARE PROVIDED IN FINAL OUTPUT DEPEND ON SEQUENCE WIDTH.

THERE IS ALSO A REPRODUCIBLE BUTTON WHICH WHEN IT IS 1 EVERY REGISTERS AND FLIPFLOPS WILL BE SET TO INITIAL CONDITIONS.

-->I HAVE ALSO USED A SMALL CONTROLLER WHICH CONTROLLS OUR OPERATION LIKE LOADING THE SEED AND THEN ON SHIFTING OUR THE OUTPUT.

-->THE CIRCUIT GENERATES GOOD SEQUENCES WHENEVER THE SEQUENCE WIDTH IS HIGH ,IT GENERATES SEQUENCES OF FULL RANDOMNESS.

-->THE SEQUNCE WILL BE REPEATING AFTER ALL OUTPUTS OF LFSR REACH THEIR INITIAL OUTPUT SO THEY ARE PSEUDO RANDOM GENERATORS.

