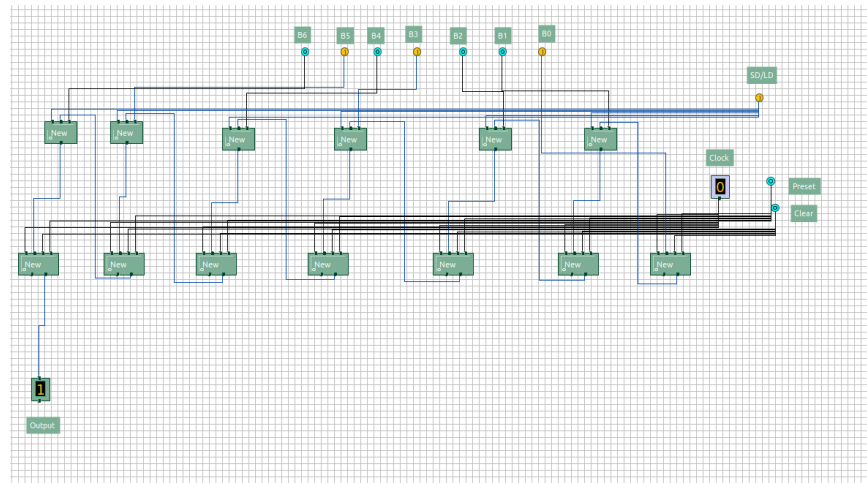# Switching Circuits And Logic Design
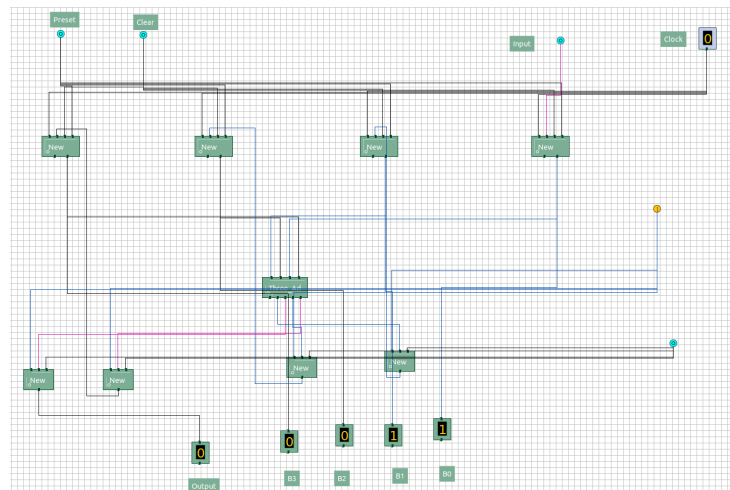
Assignment no. - 06
Group No. - 20

Explanation of 7-bit binary number to Binary Coded Decimal(BCD) -

1.   The parallel input is fed to a 7-bit parallel input serial output shift register. This shift register is constructed as follows:-

In this shift register input is first fed to D-flip flops but using 2-1 multiplexer setting shift line to 0, after that output is processed sequentially using D-flip flops by setting shift line to 1. These D-flip flops are also accompanied with parallel preset and clear lines that's why this register also needs these as input.

2.   The output of 7-bit shift register is fed to a 4-bit binary to BCD converted whose circuit is as shown: -

In the complete system its input is the bit it receives from the 7-bit register or the bit it receives from the previous unit as carry over. Its output is fed to the next unit as carry over in the complete system.

Components of 4-bit binary to BCD converter: -
- D-Flip Flop
- 2-1 Multiplexers
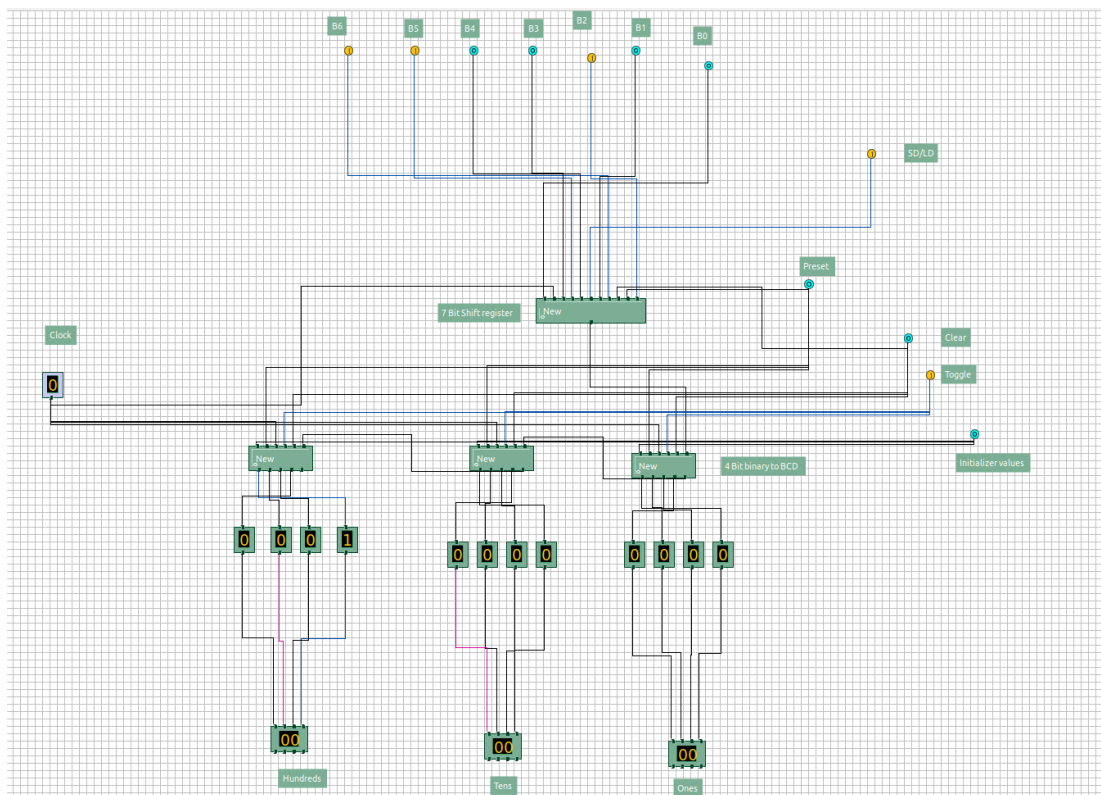- 3-Adder when input is greater than 5

Working of 4-bit binary to BCD converter: -
- Input is fed sequentially to the flip flop and this further passes that bit to 3-Adder which checks if the current input is less than 5, then it is passed as input to the next flip flop and the same process is repeated again and again till the final bit is read and the moment the input becomes larger than 3, the 3-adder comes in role and adds 3 to the input creating a carry over which is passed to the next unit in complete system.
- This circuit uses multiplexers to make all crosses on the binary display to 0 as initialisation.

3.   Output of this 4-bit binary to BCD converter is fed to display as output and the carry over part is fed as input to the next 4-bit binary to BCD converter.

In this way the system takes sequential input as converts it to BCD.

The final component is as shown in the diagram: -

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