DDS PROJECT REPORT

ON

Energy consumption monitor

UNDER THE GUIDANCE OF:

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ABSTRACT:

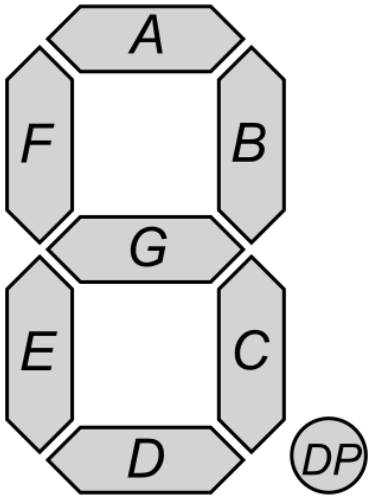
As necessity of saving power is on rise, it is necessary to make a device that shows which switches are on in the house. Also, the amount of power passing through each switch will be displayed. The device will be useful as an individual can see the switches that are on and the power consumed at each switch in one place.

COMPONENTS:

The circuit components used in the circuit are 7-segment displays, 6-bit Adder, Binary to BCD converter, multiplexer, decoder, counters and registers.

WORKING OF 7-SEGMENT DISPLAY:

The 7 segment takes a 4-bit BCD input. The truth table is shown below.



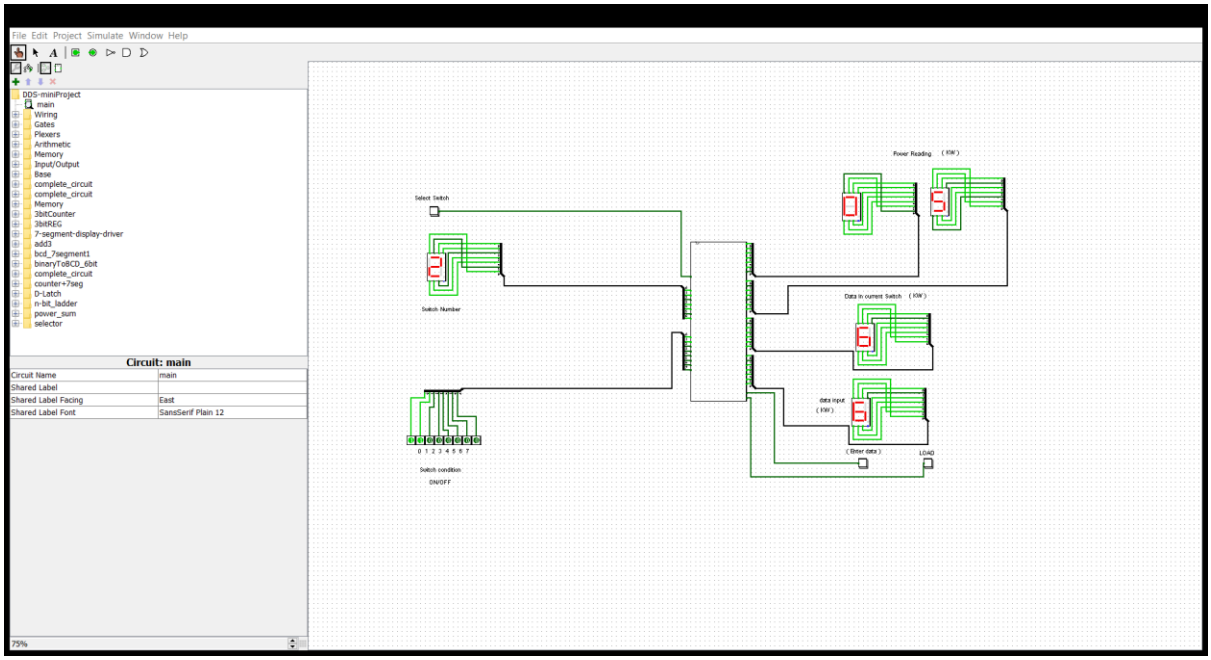
s	BCD	G	F	E	D	C	B	A
0	0000	0	1	1	1	1	1	1
1	0001	0	0	0	0	1	1	0
2	0010	1	0	1	1	0	1	1
3	0011	1	0	0	1	1	1	1
4	0100	1	1	0	0	1	1	0
5	0101	1	1	0	1	1	0	1
6	0110	1	1	1	1	1	0	1
7	0111	0	0	0	0	1	1	1
8	1000	1	1	1	1	1	1	1
9	1001	1	1	0	1	1	1	1

Depending on the input a particular set of segments light up such that the decimal value of the given BCD input is displayed.

WORKING OF THE DASHBOARD:

Whenever select switch button is pressed, it creates a positive clock edge. The positive edge triggers a counter and its value is increased by 1. The current value of counter of counter is displayed by a 7 segment display as shown. All the switches are registers (made up of d flip flops and contain an enable) used to store data of the particular switch. The binary value of current switch (that is displayed by 7 segment display) is entered into a 3x8 decoder. All the 8 outputs of the decoder are passed through an AND gate along with an enable. This output is entered to the register of respective switch and the value in the registers I ready to be overwritten. When the load button is pressed, the enable becomes 1 and the binary value present in data is written to the register of the current switch. This is used to enter power consumed by that switch. At the lower left corner there is board which shows the state of switches (whether they are on or off).

Power consumption of all the switches that are on, are added with the help of a full adder. The resultant value is converted to BCD and passed to 7 segment displays on the top right corner. Thus the two 7 segment displays on the top right corner show the total power consumption of the switches that are on.



CONCLUSION:

This Circuit displays power consumption of all the switches and total power consumption. This will help to monitor current power supply. This circuit can also be used when we want to calculate weighted sums.

REFERENCES:

- https://www.electronicshub.org/bcd-7-segment-led-display-decoder-circuit/
- http://www.tkt.cs.tut.fi/kurssit/1426/S12/Ex/ex4/Binary2BCD.pdf