Digital Project

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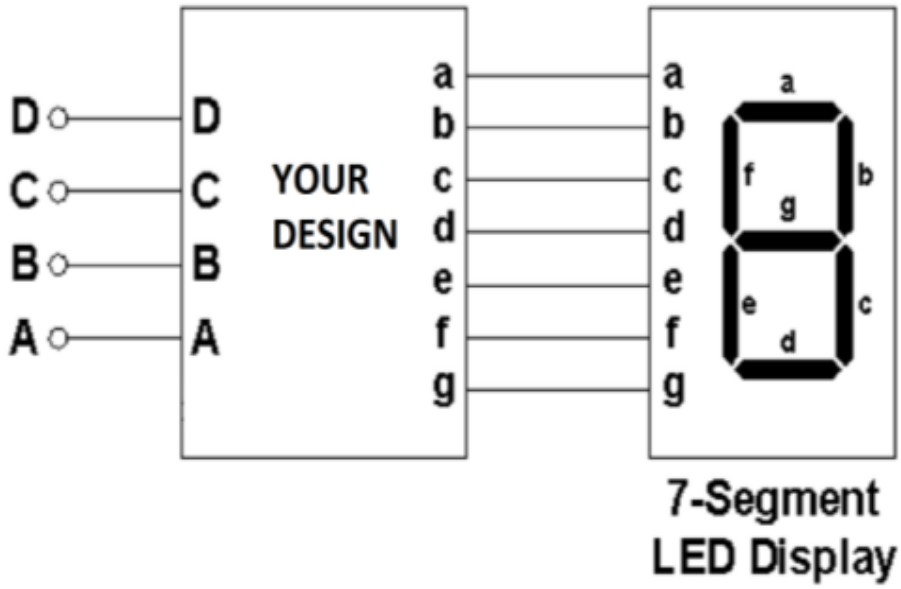
Section : 1

Description :

Design a combinational circuit using Verilog to achieve the following functionality.



Your system will have 4 inputs (A, B, C, D) and 7 outputs (a through g) that drive a 7-segment display, whose inputs are active-high. The system shall behave according to the following table:

A B C D	Display
0	The least significant decimal digit of your student ID
1	The second least significant decimal digit of your student ID
2	The third least significant decimal digit of your student ID
3	The fourth least significant decimal digit of your student ID
4	The fifth least significant decimal digit of your student ID
5	The sixth least significant decimal digit of your student ID
6	The most significant decimal digit of your student ID
7	The least significant decimal digit of your birth year
8	The second least significant decimal digit of your birth year
9	The third least significant decimal digit of your birth year
10	The most significant decimal digit of your birth year
11 - 15	Nothing

Design :

1) Code:

```
module samer_7_segmentDesign(a,b,c,d,A,B,C,D,E,F,G);

input a,b,c,d;     //inputs

output A,B,C,D,E,F,G; //outputs


assign A=(!b && !c )||(!a && !c && !d) || (!a && !b && !d ) || (!a && b && c && d ) ; //equation of output A

assign B=(a &&!b && !c )||(!b && !c && d) || (!a && !b&& c && !d ) || (!a && b && !c && !d ) ;//equation of output B

assign C=(!b && !c )||(!a && !c && !d) || (!a && !b && !d ) || (!a && b && c && d ) ; //equation of output C

assign D=(!b && !c )||(!a && !c && !d)  || (!a && b && c && d ) ;//equation of output D

assign E=(!a && !b && d )||(!a && !c && d) || (!a && b && c && !d ) || (a && !b && c && !d ) ; //equation of output E

assign F=(!a && d )||(!b && !c ) || (!a && b && c ) || (a && !b  && !d ) ; //equation of output F

assign G=(!b && !c )||(!a && !c && !d) || (!a && b && c && d ) ;//equation of output G


        //outputs will be obtained from those equations


endmodule
```

2) simulation to show that the code works well :