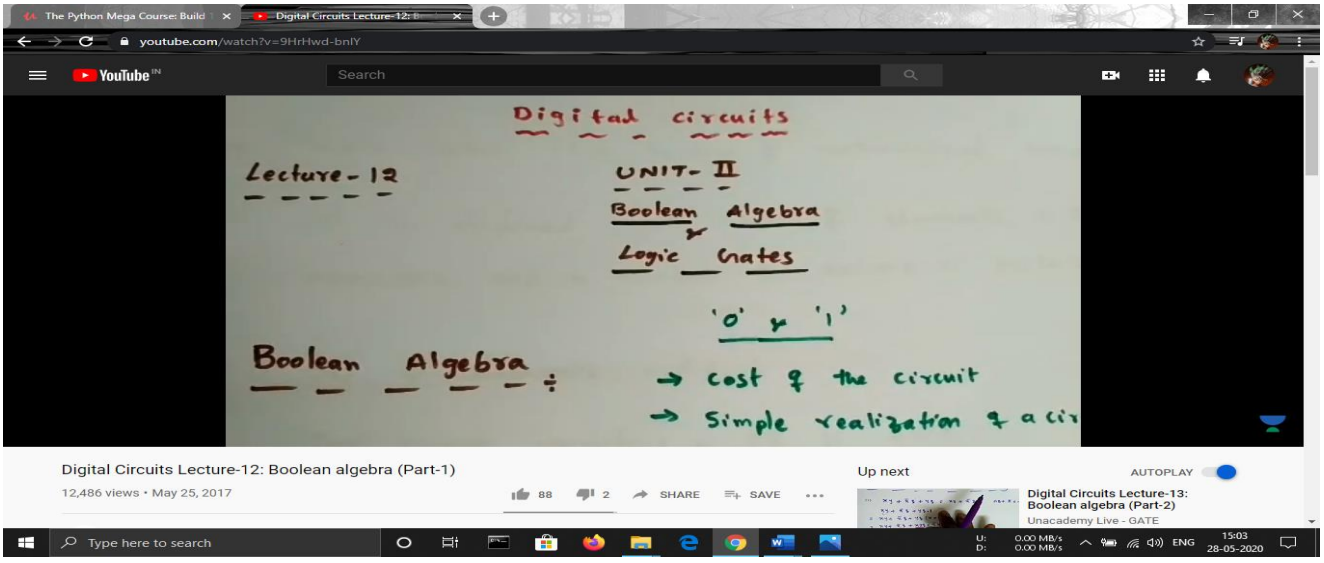
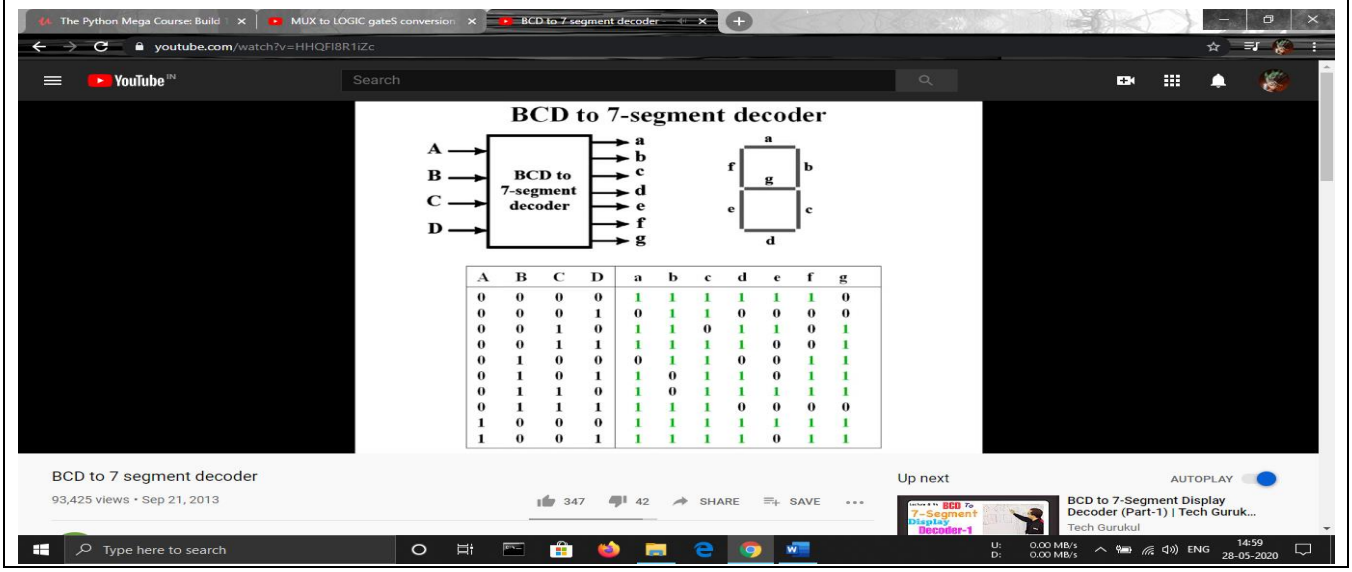
DAILY ASSESSMENT REPORT

Date:	**28/05/2020**	**Name:**	**Abhishek M Shastry K**
Subject:	**Logic Design**	**USN:**	**4AL17EC002**
Topic:	**1] Boolean equations for digital circuits 2] Combinational circuits: Conversion of MUX and Decoders to logic gates 3] Design of 7 segment decoder with common anode display**	**Semester & Section:**	**6th 'A'**
Github Repository:	**AbhishekShastry-Courses**		

FORENOON SESSION DETAILS

Image of session





A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1

Report

Boolean Algebra

Boolean Algebra is used to analyze and simplify the digital (logic) circuits. It uses only the binary numbers i.e. 0 and 1. It is also called as Binary Algebra or logical Algebra.

- **Boolean Laws**
  - ✓ **Commutative Law** - Commutative law states that changing the sequence of the variables does not have any effect on the output of a logic circuit.

    (i) $A.B = B.A$ (ii) $A + B = B + A$
  - ✓ **Associative Law** - This law states that the order in which the logic operations are performed is irrelevant as their effect is the same.

    (i) $(A.B).C = A.(B.C)$ (ii) $(A + B) + C = A + (B + C)$
  - ✓ **Distributive Law** - Distributive law states the following condition.

    $A.(B + C) = A.B + A.C$
  - ✓ **AND Law** - These laws use the AND operation. Therefore, they are called as AND laws.

    (i) $A.0 = 0$ (ii) $A.1 = A$

    (iii) $A.A = A$ (iv) $A.\overline{A} = 0$
  - ✓ **OR Law** - These laws use the OR operation. Therefore, they are called as OR laws.

    (i) $A + 0 = A$ (ii) $A + 1 = 1$

    (iii) $A + A = A$ (iv) $A + \overline{A} = 1$
  - ✓ **Inversion Law** - This law uses the NOT operation. The inversion law states that double inversion of a variable results in the original variable itself.

    $\overline{\overline{A}} = A$
  - ✓ **Absorptive Law** - This law enables a reduction in a complicated expression to a simpler one by absorbing like terms.

    A + (A.B) = A (OR Absorption Law)

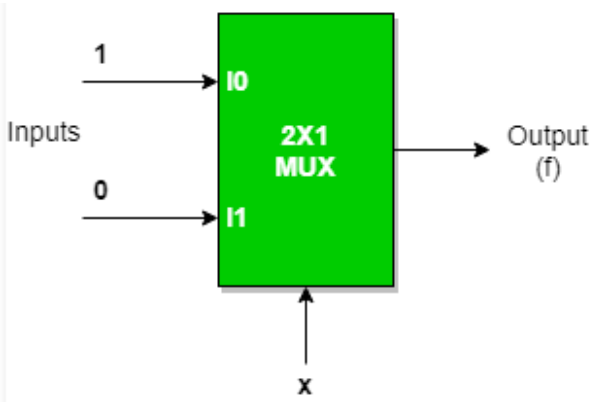
    A(A + B) = A (AND Absorption Law)

- Difference between **Boolean Algebra** and **Ordinary Algebra**.
  - ✓ In ordinary algebra, the letter symbols take any number of values. In Boolean algebra, they take two values, i.e. 0 and 1.
  - ✓ The values assigned to a variable have a numerical significance in ordinary algebra, whereas in Boolean algebra they have a logical significance.
  - ✓ "." and "+" are the signs of multiplication and addition in ordinary algebra. In Boolean algebra, "." means an AND operation and "+" means OR operation.

Conversion of MUX to Logic Gates

Multiplexers are combinational circuit which have many data inputs and single output depending on control or select inputs. For N input lines, log n (base2) selection lines, or we can say that for 2n input lines, n selection lines are required.

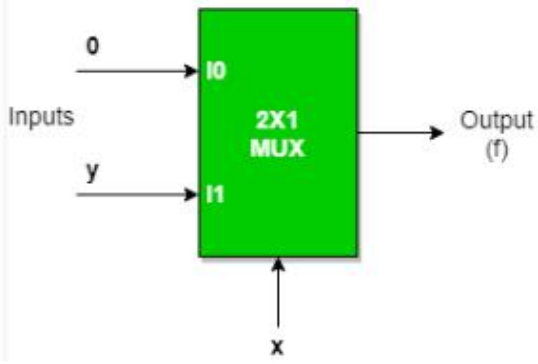
- **Implementation of various logic gates using 2 : 1 MUX**
  - ✓ **Implementation of NOT gate using 2 : 1 MUX**



Truth Table

x	f
0	1
1	0

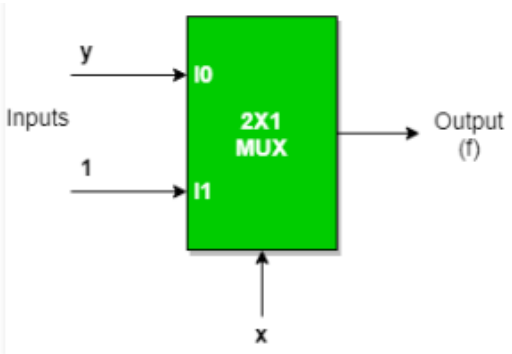
  - ✓ **Implementation of AND gate using 2 : 1 MUX**



Truth Table

x	y	f	f→y
0	0	0	f = 0
0	1	0	
1	0	0	f = y
1	1	1	

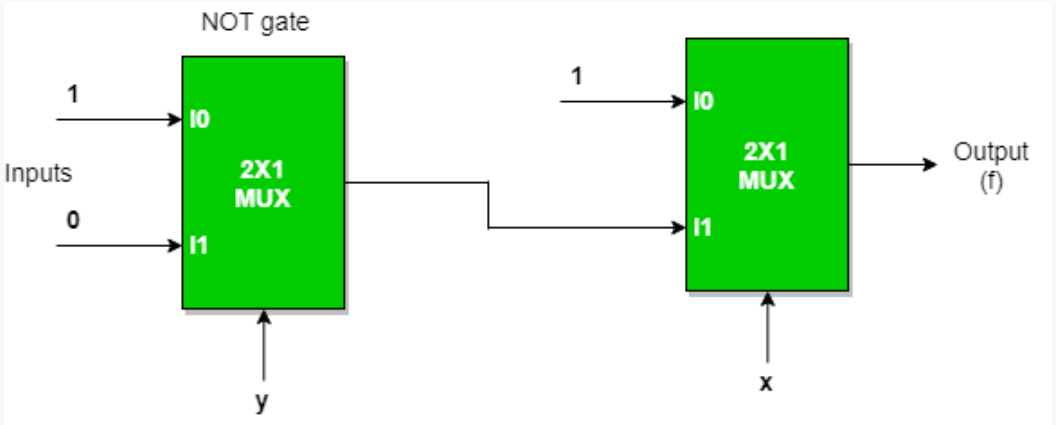
✓ **Implementation of OR gate using 2 : 1 MUX using "n-1" selection lines.**



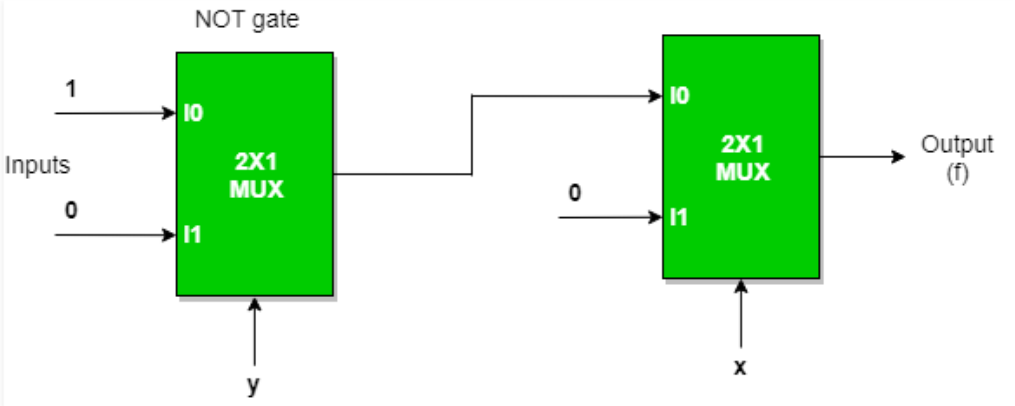
Truth Table

x	y	f	f→y
0	0	0	f = y
0	1	1	
1	0	1	f = 1
1	1	1	

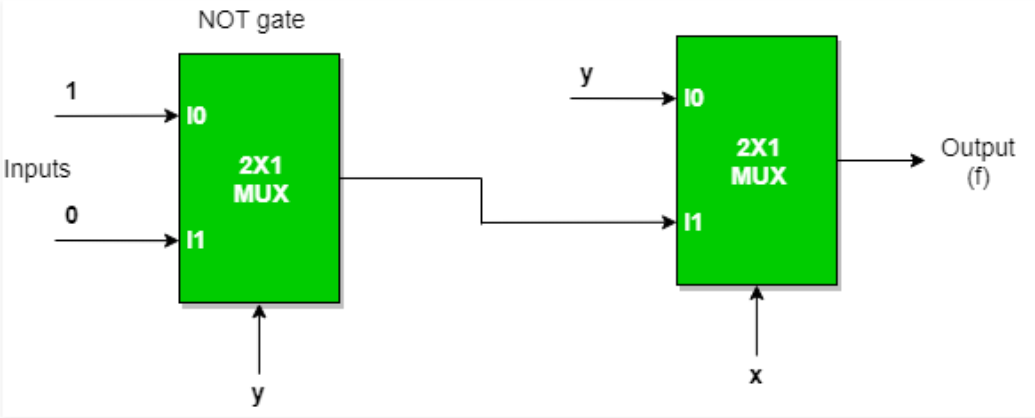
✓ **Implementation of NAND gate using 2 : 1 MUX**



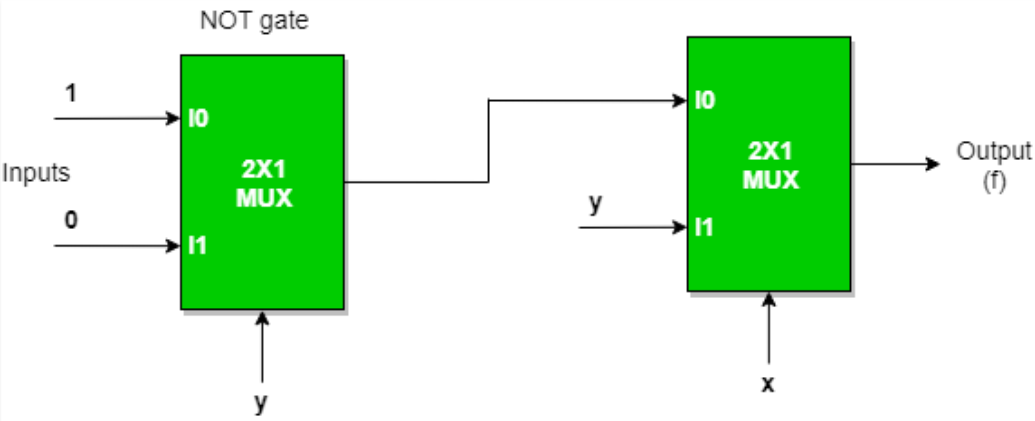
✓ **Implementation of NOR gate using 2 : 1 MUX**



✓ **Implementation of EX-OR gate using 2 : 1 MUX**



✓ **Implementation of EX-NOR gate using 2 : 1 MUX**



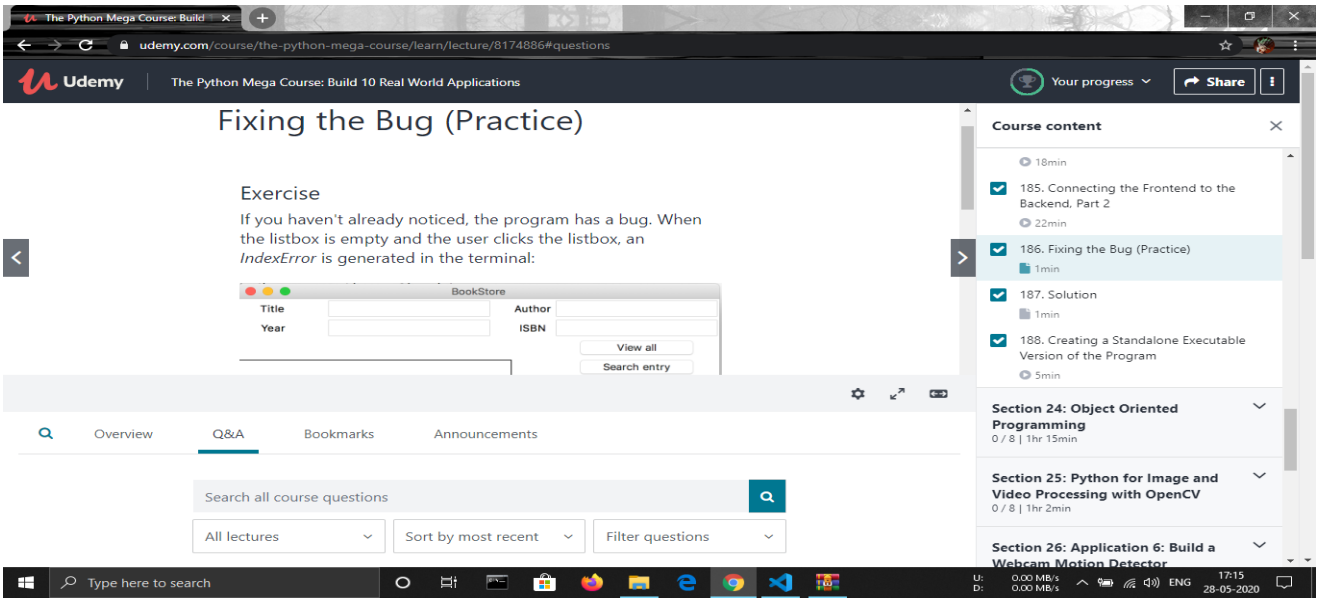
Decoder and 7-segment display

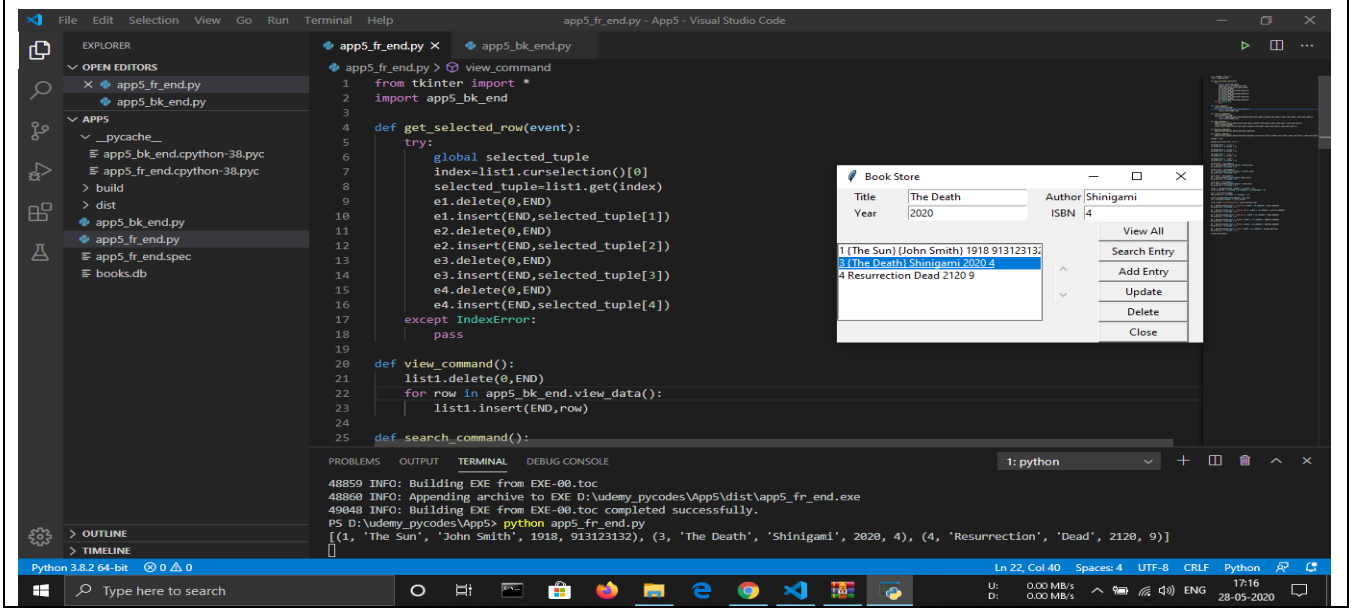
- A Digital Decoder IC, is a device which converts one digital format into another and one of the most commonly used devices for doing this is called the Binary Coded Decimal (BCD) to 7-Segment Display Decoder.
- 7-segment LED (Light Emitting Diode) or LCD (Liquid Crystal Display) type displays, provide a very convenient way of displaying information or digital data in the form of numbers, letters or even alpha-numerical characters.

Date:	28/05/2020	Name:	Abhishek M Shastry K
Course:	The Python Mega Course: Build 10 Real World Applications	USN:	4AL17EC002
Topic:	1] Application 5: Build a Desktop Database Application	Semester & Section:	6th 'A'
Github Repository:	AbhishekShastry-Courses		

AFTERNOON SESSION DETAILS

Image of session





Report

Application 5: Build a Desktop Database Application

- Python program that allows the user to store, update, delete, etc. information about the books using **Tkinter** library which is a graphical user interface and **sqlite** library which interacts with SQLite database.
- A sketch of a user interface would help in writing the python script (GUI) for the application.
- To locate widgets for the interface, the interface is divided into rows and columns and then by using grid function widgets are added to the interface.
- **Tkinter** possess three layout managers:
    - ✓ **Pack** - Pack is the easiest to use of the three geometry managers of Tk and Tkinter. Instead of having to declare precisely where a widget should appear on the display screen, we can declare the positions of widgets with the pack command relative to each other. The pack command takes care of the details. Though the pack command is easier to use, this layout managers is limited in its possibilities compared to the grid and place mangers.
    - ✓ **Grid** - Grid is in many cases the best choice for general use. The Grid geometry manager places the widgets in a 2-dimensional table, which consists of a number of rows and columns. The position of a widget is defined by a row and a column number. Widgets with the same column number and different row numbers will be above or below each other. Correspondingly, widgets with the same row number but different column numbers will be on the same "line" and will be beside of each other, i.e. to the left or the right.
    - ✓ **Place** - The Place geometry manager allows you explicitly set the position and size of a window, either in absolute terms, or relative to another window. The place manager can be accessed through the place method. It can be applied to all standard widgets.
- Executable file for the program is created with the help of **pyinstaller** library.
- **PyInstaller** bundles a Python application and all its dependencies into a **single package**. The user can run the packaged app without installing a Python interpreter or any modules.